ITCAM Agents for WebSphere Applications, J2EE, and HTTP Servers

Version 7.2

User Guide

SC27-2817-03

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Note

Before using this information and the product it supports, read the information in “Notices” on page 585.

Contents

About this guide

This guide provides a user guide for the following agents included with ITCAM for Applications 7.2.1.1:

- Agent for WebSphere® Applications on distributed systems
- Agent for J2EE
- Agent for HTTP Servers

The document also mentions the Agent for WebSphere Applications on z/OS® and IBM® i, as well as the Managing Server (deep dive functionality). These components are not available in ITCAM for Applications. They are available in ITCAM for Application Diagnostics. The agents shipped with ITCAM for Applications will interact with the components shipped in ITCAM for Application Diagnostics .

Who should read this guide

This user guide is intended for users of ITCAM for Applications.

Publications

This section lists publications in the product library and related documents. It also describes how to access Tivoli® publications online and how to order Tivoli publications.

To access publications in the ITCAM for Applications library, see the ITCAM for Applications information center.

ITCAM for Applications library for Agents for WebSphere Applications, J2EE, and HTTP Servers

The following publications are included in the ITCAM for Applications library:

- *IBM Tivoli Composite Application Manager: Agents for WebSphere Applications, J2EE, and HTTP Servers User's Guide*

  Provides the user overview, user scenarios, and Helps for agents for WebSphere Applications, J2EE, and HTTP Servers.
- *IBM Tivoli Composite Application Manager: Agents for WebSphere Applications, J2EE, and HTTP Servers Planning an Installation*

  Provides the user with a first reference point for installation or upgrade of agents for WebSphere Applications, J2EE, and HTTP Servers.
- *IBM Tivoli Composite Application Manager: Agent for WebSphere Applications Installation and Configuration Guide*

  Provides installation instructions for setting up and configuring ITCAM Agent for WebSphere Applications on distributed systems.
- *IBM Tivoli Composite Application Manager: Agent for J2EE Installation and Configuration Guide*

  Provides installation instructions for setting up and configuring ITCAM Agent for J2EE.
- *IBM Tivoli Composite Application Manager: Agent for HTTP Servers Installation and Configuration Guide*

Provides installation instructions for setting up and configuring ITCAM Agent for HTTP Servers.

- *IBM Tivoli Composite Application Manager: Agents for WebSphere Applications, J2EE, and HTTP Servers Troubleshooting Guide*

  Provides instructions on problem determination and troubleshooting for agents for WebSphere Applications, J2EE, and HTTP Servers.
- *IBM Tivoli Composite Application Manager: Agents for WebSphere Applications, J2EE, and HTTP Servers: Messaging Guide*

  Provides information about system messages received when installing and using agents for WebSphere Applications, J2EE, and HTTP Servers.
- *IBM Tivoli Composite Application Manager: Agent for WebSphere Applications Reporting Guide*

  Provides information about installing Agent for WebSphere Applications Reports and creating pre-defined and ad-hoc reports.

Related publications

The following documentation also provides useful information:

- IBM Tivoli Documentation Central:

  Information about IBM Tivoli Documentation is provided on the following website:

  https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/Tivoli%20Documentation%20Central
- IBM WebSphere Application Server:

  Information about IBM WebSphere Application Server is provided on the following website:

  http://www.ibm.com/software/webservers/appserv/was/library
- ITCAM for Application Diagnostics library:

  Information about ITCAM for Application Diagnostics Managing Server is provided on the following website:

  http://publib.boulder.ibm.com/infocenter/tivihelp/v24r1/index.jsp?topic=%2Fcom.ibm.itcamfad.doc_7101%2Fic-homepage.html
- IBM DB2®:

  Information about IBM DB2 is provided on the following website:

  http://www.ibm.com/software/data/sw-library/
- Tivoli Data Warehouse

  Information about Tivoli Data Warehouse is provided on the following website:

  https://www.ibm.com/developerworks/wikis/display/tivolidoccentral/Tivoli+Data+Warehouse
- IBM Tivoli Monitoring

  Information about IBM Tivoli Monitoring is provided on the following website:

  http://submit.boulder.ibm.com/tividd/td/EnterpriseConsole3.9.html
- IBM Tivoli Information Center:

  Information about IBM Tivoli products is provided on the following website:

  http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/index.jsp?toc=/com.ibm.tivoli.tdwi.doc/toc.xml
- IBM Tivoli Composite Application Manager for WebSphere Application Server 7.2 support for WebSphere Application Server 8.5: Installation and User Guide:

The guide is available in the Integrated Service Management (ISM) library on the following website:

http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/index.jsp?toc=/com.ibm.tivoli.tdwi.doc/toc.xml

- ITCAM Diagnostics Tool Installation Guide:

  The guide is available from the ITCAM for Applications Diagnostics beta. For more information about how to access the beta site, see the following website:

  http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/index.jsp?toc=/com.ibm.tivoli.tdwi.doc/toc.xml

Accessing terminology online

The IBM Terminology website consolidates the terminology from IBM product libraries in one convenient location. You can access the Terminology website at http://www.ibm.com/software/globalization/terminology .

Accessing publications online

The documentation CD contains the publications that are in the product library. The format of the publications is PDF, HTML, or both.

IBM posts publications for this and all other Tivoli products, as they become available and whenever they are updated, to the Tivoli software information center website. Access the Tivoli software information center by viewing the Tivoli software library at the following web address:

http://www.ibm.com/software/tivoli/library/

Tip: If you print PDF documents on other than letter-sized paper, set the option in the **File > Print** window that enables Adobe Reader to print letter-sized pages on your local paper.

The IBM Software Support website provides the latest information about known product limitations and workarounds in the form of technotes for your product. You can view this information at the following website:

http://www.ibm.com/software/support

Ordering publications

You can order many Tivoli publications online at the following website:

http://www.elink.ibmlink.ibm.com/public/applications/ publications/cgibin/pbi.cgi

You can also order by telephone by calling one of these numbers:

- In the United States: 800-879-2755
- In Canada: 800-426-4968

In other countries, contact your software account representative to order Tivoli publications. To locate the telephone number of your local representative, perform the following steps:

1. Go to the following website:

   http://www.elink.ibmlink.ibm.com/public/applications/publications/cgibin/pbi.cgi

2. Select your country from the list and click **Go**.
3. Click **About this site** in the main panel to see an information page that includes the telephone number of your local representative.

Accessibility

Accessibility features help users with a physical disability, such as restricted mobility or limited vision, to use software products successfully. With this product, you can use assistive technologies to hear and navigate the interface. You can also use the keyboard instead of the mouse to operate most features of the graphical user interface. For more information, see"Accessibility," on page 579.

Application Performance Management community on Service Management Connect

Connect, learn, and share with Service Management professionals: product support technical experts who provide their perspectives and expertise.

Access Service Management Connect at https://www.ibm.com/developerworks/servicemanagement/apm/index.html. Use Service Management Connect in the following ways:

- Become involved with transparent development, an ongoing, open engagement between other users and IBM developers of Tivoli products. You can access early designs, sprint demonstrations, product roadmaps, and prerelease code.
- Connect one-on-one with the experts to collaborate and network about Tivoli and the (enter your community name here) community.
- Read blogs to benefit from the expertise and experience of others.
- Use wikis and forums to collaborate with the broader user community.

Tivoli technical training

For Tivoli technical training information, see the following IBM Tivoli Education website:

http://www.ibm.com/software/tivoli/education/

Supporting information

If you have a problem with your IBM software, you want to resolve it quickly. IBM provides the following ways for you to obtain the support you need:

- Searching knowledge bases: You can search across a large collection of known problems and workarounds, Technotes, and other information.
- Obtaining fixes: You can locate the latest fixes that are already available for your product.
- Contacting IBM Software Support: If you still cannot solve your problem, and you need to work with someone from IBM, you can use various ways to contact IBM Software Support.

Conventions used in this guide

This guide uses several conventions for special terms and actions, and operating-system-dependent commands and paths.

Typeface conventions

This guide uses the following typeface conventions:

Bold

- Lowercase commands and mixed case commands that are otherwise difficult to distinguish from surrounding text
- Interface controls (check boxes, push buttons, radio buttons, spin buttons, fields, folders, icons, lists, items inside lists, multicolumn lists, containers, menu choices, menu names, tabs, property sheets), labels (such as **Tip**, and **Operating system considerations**)
- Keywords and parameters in text

Italic

- Words defined in text
- Emphasis of words (for example, "Use the word *that* to introduce a restrictive clause.")
- New terms in text (except in a definition list)
- Variables and values you must provide

Monospace

- Code and other examples
- File names, programming keywords, and other elements that are difficult to distinguish from surrounding text
- Message text and prompts addressed to the user
- Text that the user must type
- Values for arguments or command options

Operating-system-dependent variables and paths

The publications in this library use the UNIX convention for specifying environment variables and for directory notation.

When using the Windows command line, replace **$***variable* with **%***variable***%** for environment variables and replace each forward slash (**/**) with a backslash (\) in directory paths. The names of environment variables are not always the same in Windows and UNIX. For example, %TEMP% in Windows is equivalent to $tmp in UNIX.

Note: If you are using the bash shell on a Windows system, you can use the UNIX conventions.

Tivoli command syntax

The following special characters define Tivoli command syntax:

[ ] Identifies elements that are optional. Required elements do not have brackets around them.

... Indicates that you can specify multiple values for the previous element. Separate multiple values by a space, unless otherwise directed by command information.

If the ellipsis for an element follows a closing bracket, use the syntax within the brackets to specify multiple values. For example, to specify two administrators for the option [**–a** *admin*]..., use **–a admin1 –a admin2**.

If the ellipsis for an element is within the brackets, use the syntax of the last element to specify multiple values. For example, to specify two hosts for the option [**–h** *host*...], use **–h host1 host2**.

| Indicates mutually exclusive information. You can use the element on either side of the vertical bar.

{ } Delimits a set of mutually exclusive elements when a command requires one of them. Brackets ([ ]) are around elements that are optional.

In addition to the special characters, Tivoli command syntax uses the typeface conventions described in "Typeface conventions" on page xi. The following examples illustrate the typeface conventions used in Tivoli command syntax:

- **wcrtpr** [**–a** *admin*]... [**–s** *region*] [**–m** *resource*]... *name*

  The *name* argument is the only required element for the **wcrtpr** command. The brackets around the options indicate they are optional. The ellipses after the **–a** *admin resource* option means that you can specify multiple administrators multiple times. The ellipses after the **–m** *resource* option means that you can specify multiple resources multiple times.

- **wchkdb** [**–o** *outfile*] [**–u**] [**–x**] {**–f** *infile* | **–i** | *object*...}

  The **–f**, **–i**, and *object* elements are mutually exclusive. Braces that surround elements indicate that you are including a required element. If you specify the *object* argument, you can specify more than one object.

Part 1. Part 1: Introduction to the agents

Chapter 1. Overview of the agents

IBM Tivoli Composite Application Manager (ITCAM) agents for WebSphere Applications, J2EE, and HTTP Servers are a monitoring, diagnostics, and management technology for WebSphere, JEE, and HTTP servers in a distributed environment. They also provide enhanced support for monitoring Virtual Enterprise and Compute Grid products from the WebSphere XD suite. They help to maintain and improve the availability and performance of on-demand applications in your environment. It helps you to quickly locate in real time the source of bottlenecks in application code, server resources, and external system dependencies.

The agents can monitor application servers and HTTP servers at different levels. Monitoring applications incurs an unavoidable cost in terms of processing time. To minimize this cost, multiple monitoring levels are available. A minimum amount of information is collected during standard operations. As problems are encountered, the level of information that is collected can be gradually increased until the problem is located and solved.

Agent functionality

The agents can perform monitoring, diagnostics, and management functions for WebSphere, JEE, and HTTP servers.

Monitoring

The agents can monitor the following WebSphere, JEE, and HTTP servers:

- WebSphere servers
  - WebSphere Application Server (Network Deployment)
  - WebSphere Application Server (Extended Deployment)
  - WebSphere Process Server
  - WebSphere Portal Server
  - WebSphere ESB Server
  - WebSphere Business Process Manager Server
  - WebSphere Extreme Scale
  - WebSphere Virtual Enterprise
  - WebSphere Compute Grid
- JEE servers
  - SAP NetWeaver
  - JBoss Application Server
  - Apache Tomcat
  - Oracle/BEA WebLogic Server
  - Java™ 2, Standard Edition applications
- HTTP servers
  - Apache Web Server
  - IBM HTTP Server
  - Sun Java System Web Server

Diagnosing

Use the agents to diagnose the following problems in your on-demand application environment:

- Hanging requests
- Lock contention problems
- Malfunctioning applications in a server farm
- Memory problems relating to garbage collection and JVM (Java Virtual Machine) heap size

Managing

Use the agents to perform the following management functions in your on-demand application environment:

- Start and stop monitored servers
- Manage servers using groups
- Configure data collector
- Use roles to restrict access to features
- Use server groups to grant access to servers
- Adjust the monitoring level at specific times based on the current work load of the server

User interfaces

Functions of the agents can be broadly divided into two areas: monitoring and diagnostics. Each of these functions uses different combinations of components. Each function also uses a different user interface. The two user interfaces are the Tivoli Enterprise Portal and the Managing Server Visualization Engine (MSVE).

The Tivoli Enterprise Portal user interface

The Tivoli Enterprise Portal is part of the IBM Tivoli Monitoring architecture. The Tivoli Enterprise Portal is the user interface into your ITCAM for Application Diagnostics environment site and possibly other IBM Tivoli enterprise applications if they are installed in your environment. For further information about the Tivoli Monitoring architecture, see "Components used by the Tivoli Enterprise Portal user interface" on page 5.

Using the Tivoli Enterprise Portal interface, you can easily monitor the health and availability of production applications and application servers. You can also quickly identify and isolate availability and response time problems. The Tivoli Enterprise Portal provides monitoring information, such as memory usage, response time, pool analysis, and data source analysis. The Tivoli Enterprise Portal enables you to *drill down* from server level metrics to specific application and resource level metrics.

MSVE user interface

The MSVE user interface provides users with management and monitoring functions for application servers. The MSVE also provides a diagnostic function. Here are some of the diagnostic activities you can perform in MSVE:

- Detect transactions failing
- Detect memory leaks

- Examine detailed method traces, which help to detect application code hotspots
- Generate reports to analyze historical information, such as application performance and OS performance

Important: The managing server, providing the MSVE user interface, is not included with ITCAM for Applications. It is available with ITCAM for Application Diagnostics. The agents included with ITCAM for Applications can interact with the ITCAM for Application Diagnostics managing server. For more information about the MSVE, see the documentation for ITCAM for Application Diagnostics.

Components used by the Tivoli Enterprise Portal user interface

A number of components work together to collect, analyze, and display monitoring data in the Tivoli Enterprise Portal. These components are:

1. The Agents
2. IBM Tivoli Monitoring components

The agents

There are separate agents for WebSphere, J2EE, and HTTP servers. The agents consist of the following components:

- Tivoli Enterprise Monitoring Agent (referred to as the monitoring agent)
- Data Collector

Important: The exception is the HTTP servers agent. The HTTP servers agent does not contain a data collector. Only the WebSphere and J2EE Agents contain data collector.

The Monitoring Agent: The monitoring agent is a component of the IBM Tivoli Monitoring architecture. The purpose of the monitoring agent is to route information to the Tivoli Enterprise Monitoring Server (monitoring server) where the information is processed and presented in the Tivoli Enterprise Portal.

The Data Collector: The purpose of the data collector is to collect and route data to the monitoring agent. It is not intended to analyze or interpret data.

On each WebSphere and J2EE server that you monitor, an agent is installed; so there is a monitoring agent and a data collector running on each server you are monitoring.

For example, if you are monitoring a Tomcat server, a J2EE Agent is installed on this server. If you are monitoring a WebSphere Portal server, a WebSphere Agent is installed.

For information about software prerequisites, see the Software product compatibility reports website to generate a variety of reports related to product and component requirements.

Tip: The agents are components of ITCAM for Applications version 7.2.1. To run a report specific to ITCAM for Applications version 7.2.1, specify Tivoli Composite Application Manager for Applications as the product name and 7.2.1 as the version.

The WebSphere agent

The WebSphere agent consists of a monitoring agent and a data collector. The WebSphere monitoring agent works with the WebSphere data collector. The WebSphere data collector collects monitoring data from WebSphere servers and communicates the data to the monitoring agent.

The WebSphere Agent collects data from five primary sources:

- Response time data for application service requests from the data collector
- Resource data from the WebSphere Performance Monitoring Infrastructure (PMI)
- WebSphere Application Server log messages
- Garbage-collector activity that is recorded in the JVM verbose GC trace
- Process data from the operating system

The J2EE agent

The J2EE agent is composed of a monitoring agent and a data collector. The J2EE agent works with the J2EE data collector to collect performance data from J2EE application servers. The J2EE data collector collects monitoring data from J2EE servers and communicates the data to the monitoring agent. The J2EE agent collects data from five main sources:

- Response time data for application service requests from the data collector
- J2EE application server log messages
- Garbage collection activity that is recorded in the JVM verbose GC trace
- Resource data from the application server mbean
- Process data from the operating system

The HTTP agent

The HTTP agent is composed of a monitoring agent only. The monitoring agent can monitor the following HTTP servers:

- Apache Web Servers
- IBM HTTP Web Servers
- Sun Web Servers

The HTTP agent collects performance data about the web servers and websites in the following ways:

Apache Server and HTTP Server: The agent modifies the Apache server and IBM HTTP server configuration files to include the monitoring module. The monitoring module is loaded dynamically during web server startup. The module receives all HTTP requests and reports data to the HTTP agent. In addition, the HTTP agent parses static information from the configuration file.

Sun Web Server: The HTTP agent collects monitoring data from Sun Web servers by polling the SNMP service for web server-related statistics. It also parses web server configuration files to get information that is not provided by the SNMP service.

IBM Tivoli Monitoring components

IBM Tivoli Monitoring monitors the performance and availability of distributed operating systems and applications. IBM Tivoli Monitoring products are based on a

set of common service components. These service components provide security, data transfer and storage, notification mechanisms, user interface presentation, and communication services in an agent-server-client architecture. Some of these service components are shared by other products, including IBM Tivoli OMEGAMON® XE mainframe monitoring products, ITCAM for Application Diagnostics, and ITCAM for Applications.

The service components shared by ITCAM for Application Diagnostics and IBM Tivoli Monitoring are as follows:

- Tivoli Enterprise Monitoring Server (referred to as the monitoring server)
- Tivoli Enterprise Portal Server (referred to as the Portal Server)
- Tivoli Enterprise Portal
- Tivoli Enterprise Monitoring Agent (referred to as the monitoring agent)

ITCAM for Application Diagnostics uses the service components of IBM Tivoli Monitoring. The ITCAM for Application Diagnostic monitoring agents integrate with components in the IBM Tivoli Monitoring environment by retrieving data from the monitoring agents and forwarding it to the Portal Server where it is displayed in the Tivoli Enterprise Portal.

Here is some further information regarding the shared service components and how they integrate with ITCAM for Application Diagnostics:

Tivoli Enterprise Monitoring Server: The Monitoring Server performs the following functions:

- Acts as a collection and control point for alerts that are received from the monitoring agents
- Tracks the heartbeat request interval for all monitoring agents connected to it
- Stores, initiates, and tracks all situations and policies, and is the central repository for storing all active conditions on every monitoring agent
- Initiates and tracks all generated actions that start a script or program on the monitoring agent

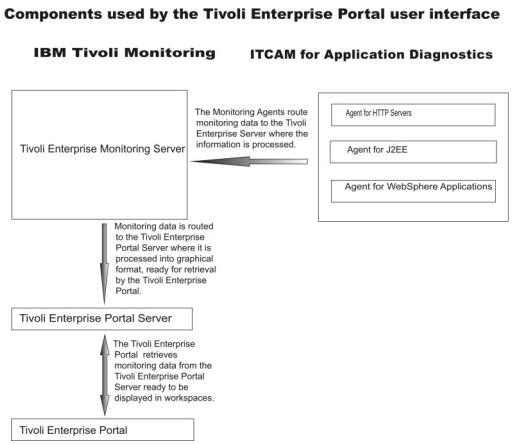
Tivoli Enterprise Portal Server: The Portal Server performs the following functions:

- Acts as a repository for all graphical presentations of monitoring data
- Provides the core presentation layer, which allows for the retrieval, manipulation, analysis, and reformatting of data
- Manages data access through user workspace consoles

Tivoli Enterprise Portal: The Tivoli Enterprise Portal is a Java user interface that connects to the monitoring server and displays monitoring data. The Tivoli Enterprise Portal can be launched from an Internet Explorer browser, or can be installed as a client application on a workstation. The Tivoli Enterprise Portal is one of the user interfaces for ITCAM for Application Diagnostics, the other user interface is the MSVE.

Tivoli Enterprise Monitoring Agent: The monitoring agents are responsible for data gathering. The monitoring agents communicate monitoring data to the Monitoring Server and the managing server. In ITCAM for Application Diagnostics, the WebSphere, J2EE, and HTTP agents contain monitoring agents.

The following diagram shows the component used by the Tivoli Enterprise Monitor:



For more information about the ITCAM for Application Diagnostics agents, see "The agents" on page 5. For more information about the IBM Tivoli Monitoring, see IBM Tivoli Monitoring Information Center

Chapter 2. Scenarios

The following scenarios describe how the agents might be used to monitor and diagnose problems in your application environment.

The following fictitious personas are used in the scenarios to reflect typical positions in your organization:

Table 1. Personas

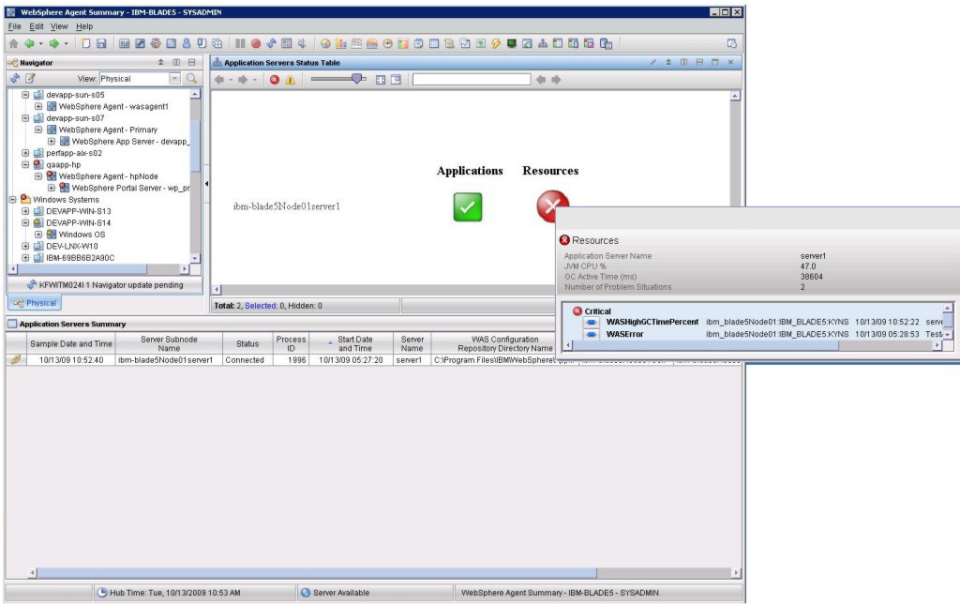
Persona	Description
Annette – Level 2 Operator	Annette's main focus is to find which component is down, which components are affected, and the location of the problem. In addition, Annette follows procedures to correct the problem. If Annette cannot fix the problem within a time limit stipulated by her service level agreement (SLA), she produces a trouble ticket and escalates the problem.
Jim – Middleware/Application Support Subject Matter Expert (SME)	Jim's main focus is to ensure that the middleware applications he is responsible for are functional at all times. If an application goes down, then a line of business is affected and has a direct affect on how Jim's team is rated against their SLA. Jim also works with the systems monitoring and automation group to define the appropriate monitors and thresholds for his domain area of responsibility.
Dave – Application Developer	Dave's main focus is to develop in-house applications. When a problem arises in a production application, he is sent trace files so that he can analyze the problem, which he then tries to simulate in his environment.
Simon – Operating System Specialist	Simon's main focus is to work with the Systems Management team to define what the base OS services/daemons, ports, file systems, and logs are that must be monitored on every computer. He is also a recognized expert in cluster configurations.

Scenario 1: Diagnosing a memory leak

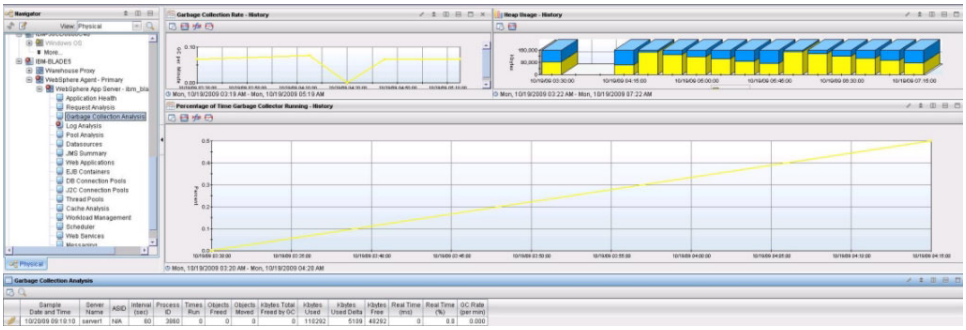
Users are reporting slow response times for an application. A user contacts the help desk and raises a ticket for slow response time in relation to an application. Annette, the level 2 operator, picks up the ticket.

Important: This scenario assumes that you have ITCAM for Application Diagnostics, which includes the Managing Server.

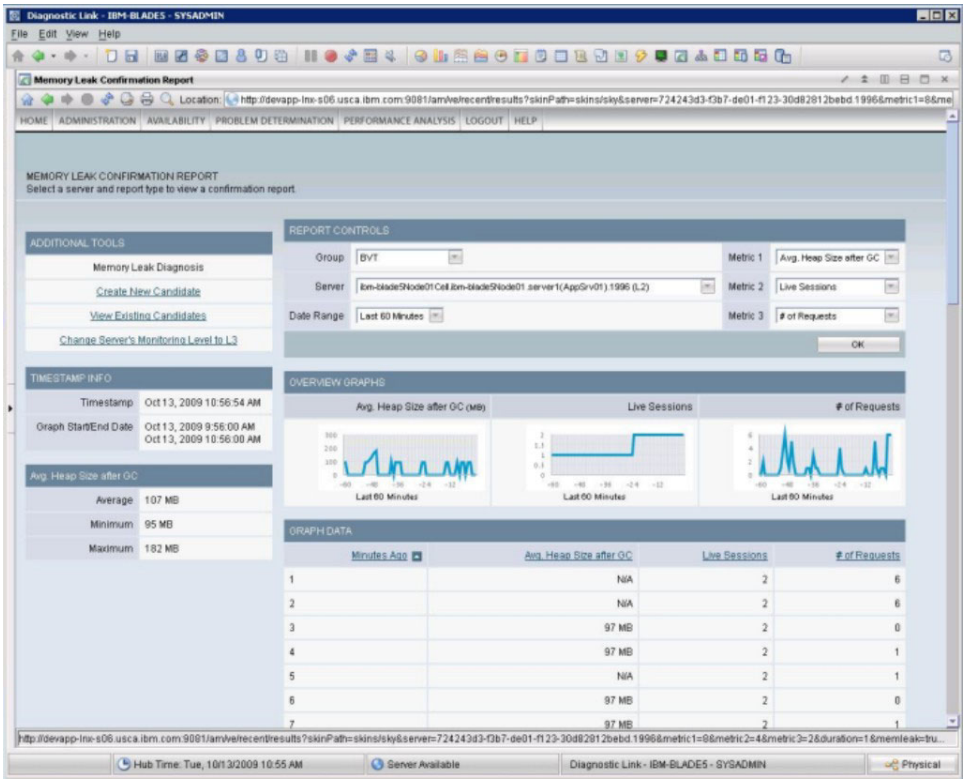
1. Annette navigates to the Tivoli Enterprise Portal and notices that the **Resources** icon is displaying a Critical symbol. On the **Resources** icon flyover, the GC Active Time (ms) metric is displaying a high value and also the WASHighGCTimePercent situation has triggered. This indicates that the JVM garbage collection is taking too much time.



2. In the Garbage Collection Analysis workspace, Annette sees that the Percentage of Time Garbage Collector Running - History view displays an increasing trend. The increasing trend suggests that the heap is insufficient for the demand being put on it by applications. The Running - History graph, which displays the percentage of real time that the garbage collector was running during the current interval for each server region, shows an increasing trend. This trend suggests that either the heap size is insufficient for the demand that applications are putting on it, or that there is a memory leak.



3. Annette uses an external ticketing tool to route the ticket to Jim, the Middleware/Application SME, for further observance and investigation.
4. Jim notices a problem ticket from Annette involving excessive garbage collection times. Jim navigates to the Garbage Collection Analysis workspace and confirms the problem. He requires more detailed information to diagnose the cause of the problem. He clicks the **Diagnostic Memory Leak** link in the Garbage Collection Analysis workspace to open the Memory Leak Confirmation report page in MSVE.



5. From examining the Memory Leak Confirmation report page in MSVE, Jim suspects that there is a memory leak.
6. To determine if there is a memory leak, Jim sets the monitoring level to L3 and enables memory leak BCI by completing the following steps:
   - Edits the file: `$DC_HOME/runtime/appserver_version.node_name.server_name/custom/toolkit_custom.properties` file and sets the property `com.ibm.tivoli.itcam.toolkit.ai.enablememoryleakdiagnosis=true`.
   - Uncomments this line to enable Memory Leak Diagnosis (the path in the line might be slightly different):`am.camtoolkit.gpe.customxml.leak=/opt/IBM/AD710/aix533/yn/wasdc/7.2/itcamdc/etc/memory_leak_diagnosis.xml`
   - Restarts the data collector.

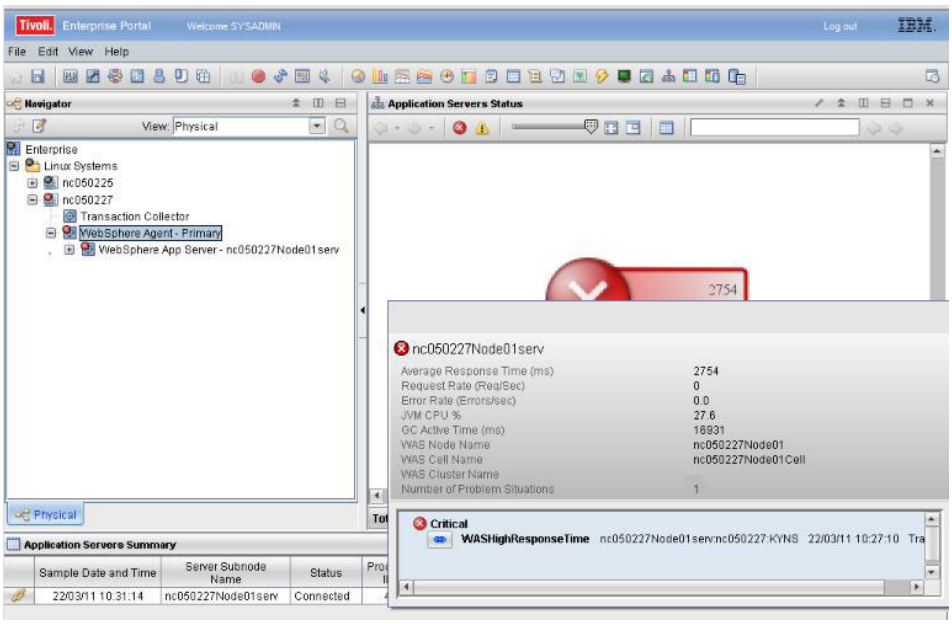
   Jim forwards the problem to Dave, the application developer. Dave works to resolve the problem. This action is outside the scope of ITCAM for Application Diagnostics.

Scenario 2: Diagnosing hanging transactions

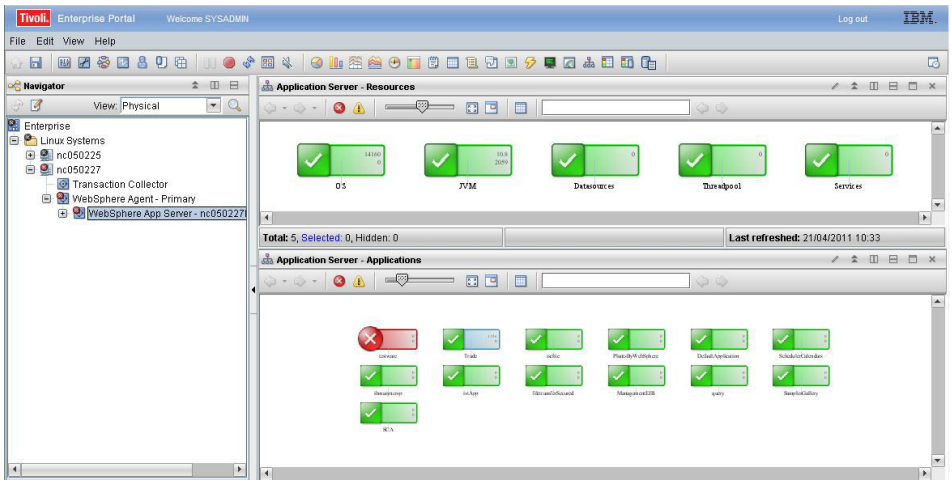
Annette, the level 2 operator, receives an email indicating that a situation triggered in the Tivoli Enterprise Portal. The situation indicates that response time is slow for an application.

Important: This scenario assumes that you have ITCAM for Application Diagnostics, which includes the Managing Server.

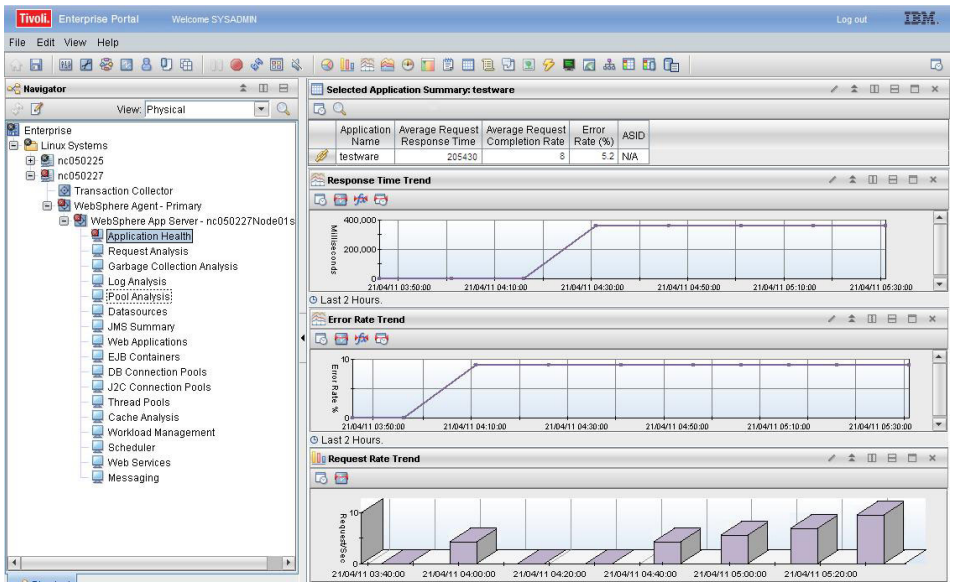
1. In the Tivoli Enterprise Portal, Annette points to the critical icon in the WebSphere Agent Summary Status workspace. Annette sees in the flyover that the WASHighResponseTime situation triggered.



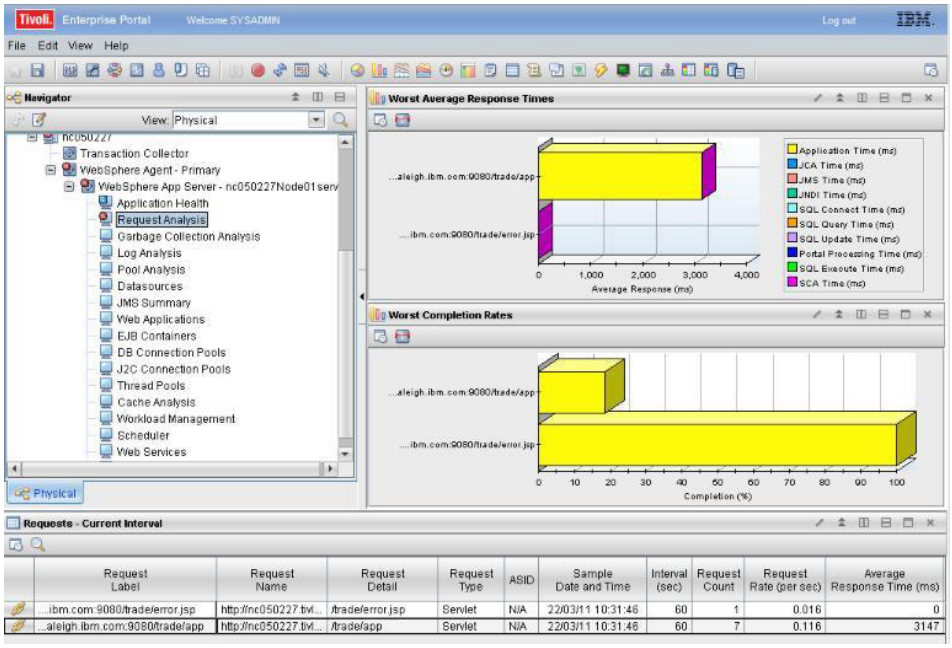
2. Annette double-clicks the critical icon and the Application Server Summary workspace opens.



3. Annette double-clicks the critical application icon and the Application Trend workspace is displayed. In this workspace, the Application Summary report displays information about response time, error rate, and request rate.

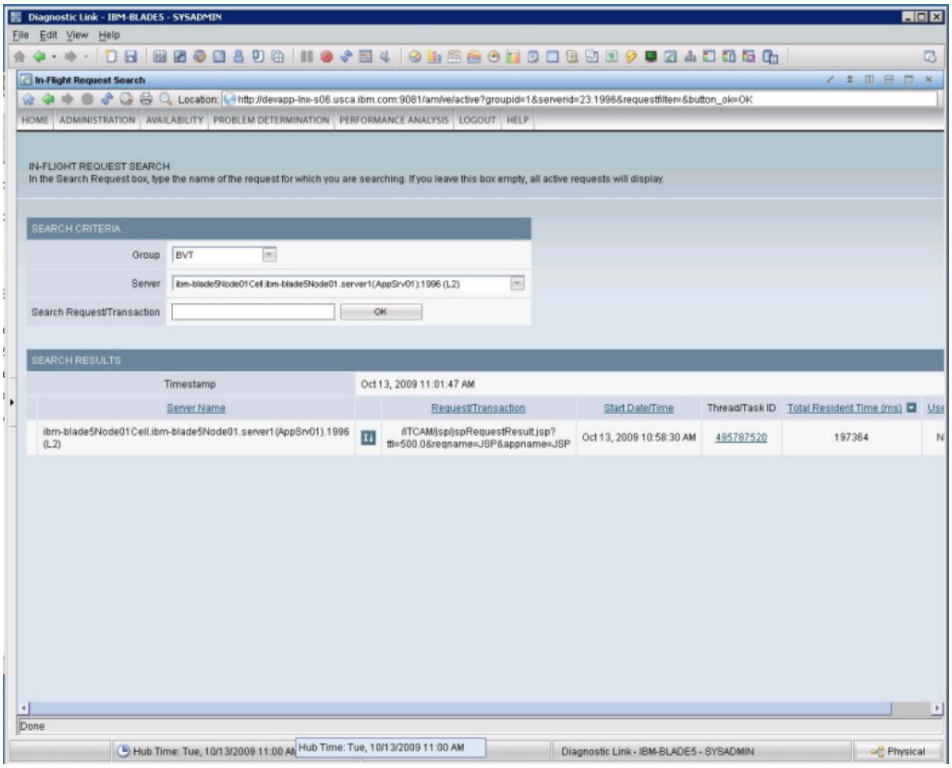


4. For a more detailed analysis of requests, Annette navigates to the Request Analysis workspace, by using the navigation tree. The Request Analysis workspace displays information about worst average request response time and worst average request completion rate. Annette observes that the average request response time is high and that the average request completion rate is low (for some of the requests).

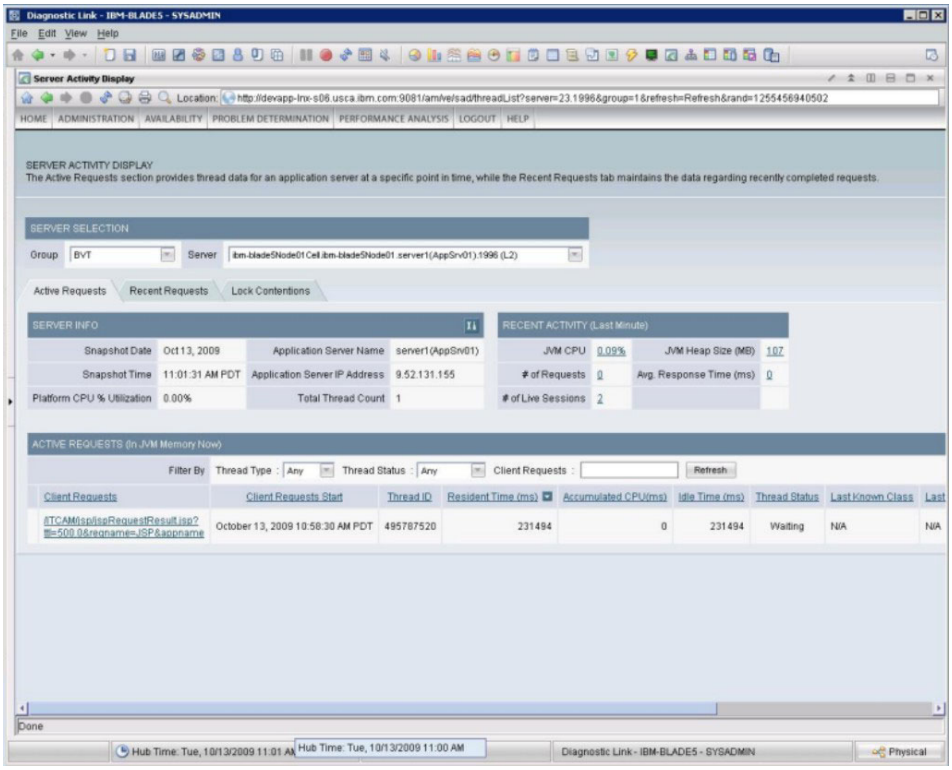


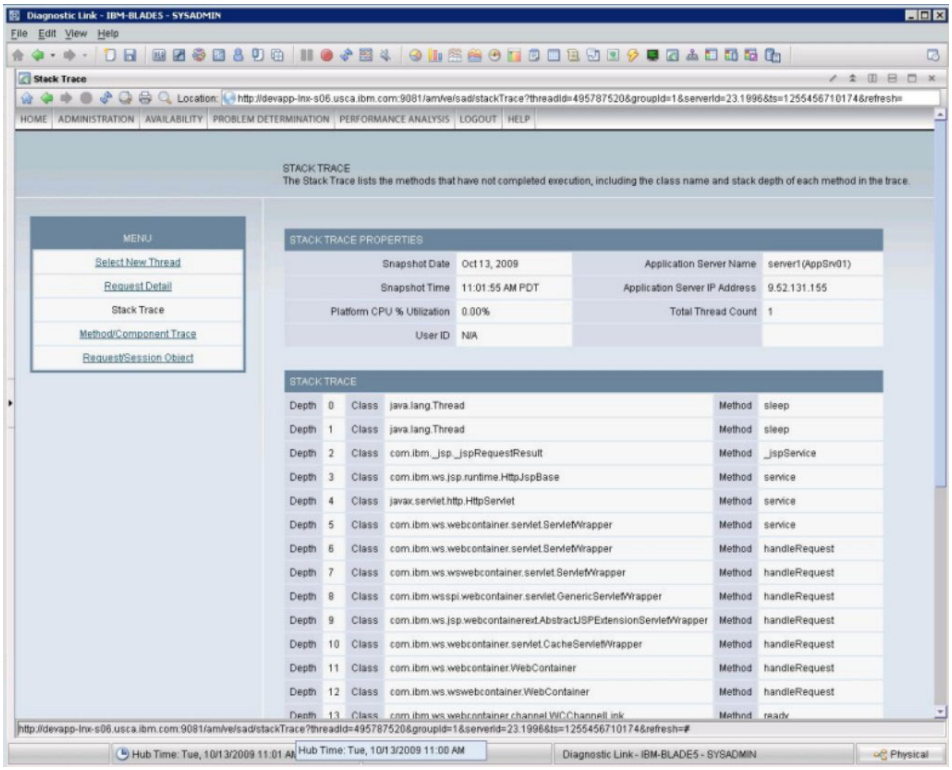
5. Annette uses an external ticketing tool to route the ticket to Jim, the Middleware/Application Support SME, for further observance and investigation.
6. Jim notices a problem ticket from Annette indicating slow response times. Jim navigates to the Request Analysis workspace in the Tivoli Enterprise Portal and confirms the slow request response time for the application.
7. To see individual hanging transactions, Jim must open MSVE. Jim right-clicks the chain icon for the request and selects the Diagnostic In-Flight Request Search link. This link displays the In-flight Request Search page in the MSVE.

Server and request information is carried over from the Request Analysis workspace.



8. From here, Jim can diagnose hanging requests and see the stack trace for that request by clicking the server activity display.



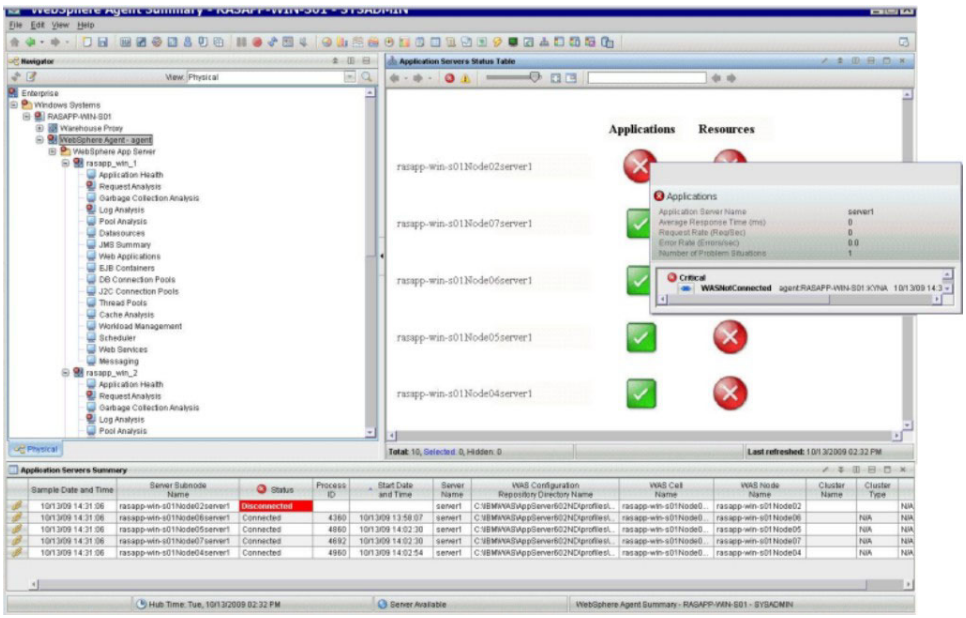


9. Jim does not have enough information in the stack trace to debug the problem, so he enables L3 monitoring. The `toolkit_custom.properties` file has already been enabled for method entry/exit trace.
10. Next, Jim enables L3 monitoring by clicking **Administration** > **Monitoring on Demand** and clicking **Schedule Change/Override**.
11. Jim returns to the In-Flight Request Search page and clicks the Thread/Task ID for the request.
12. Jim clicks the **Method/Component Trace** link to display method trace details.
13. Jim then forwards details to Dave, the application developer, by clicking **Email PDF**. Dave works to resolve the problem. This action is outside the scope of ITCAM for Application Diagnostics.
14. After collecting the data, Jim returns the data collector to L1 monitoring.

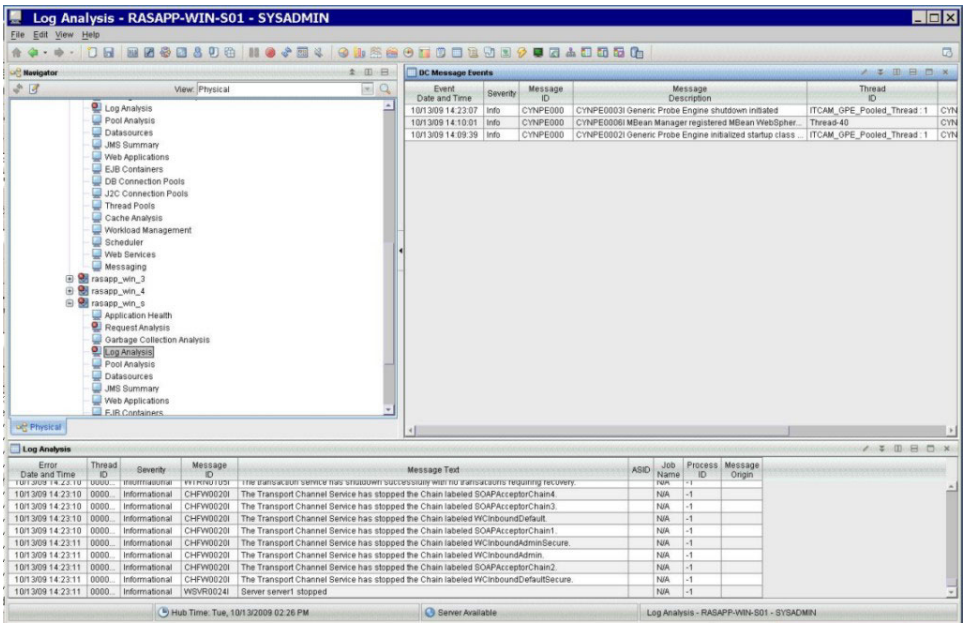
Scenario 3: Diagnosing a WebSphere server shutdown

Annette, the level 2 operator, receives a severity 1 ticket indicating that users cannot access an application.

1. Annette navigates to the Tivoli Enterprise Portal where (in the WebSphere Agent Summary Status workspace) the Applications icon is displaying a critical symbol. The flyover on the application icon shows that a WasNotConnected situation triggered. The application server summary also shows the server status as “Disconnected.”



2. Annette navigates to the Log Analysis workspace. This workspace reports application server errors and exception conditions that are recorded in the WebSphere Application Server `SystemOut.log` file log. The information in this workspace includes the exception severity of errors, and the ID and text of the associated message.
3. Annette observes that in the Log Analysis report, the Process ID value is displayed as `-1`. This value indicates that the data collector is disconnected. If a WebSphere server shutdown occurs, the connection between the data collector and Tivoli Enterprise Monitoring Agent is closed. However, the data collector continues to write to log files and Tivoli Enterprise Monitoring Agent processes these records but sets the PID value to `-1`.

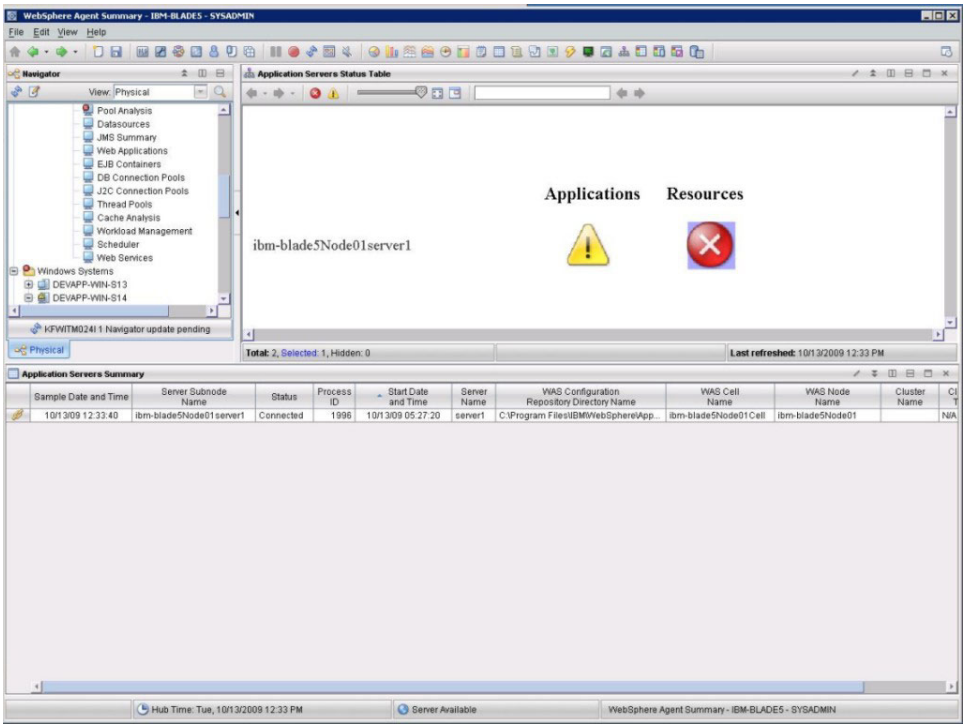


4. Annette uses an external ticketing team to forward the ticket to Jim the Middleware/Application Support SME. Jim investigates the cause of the WebSphere server shutdown and initiates a restart of the WebSphere Application Server.

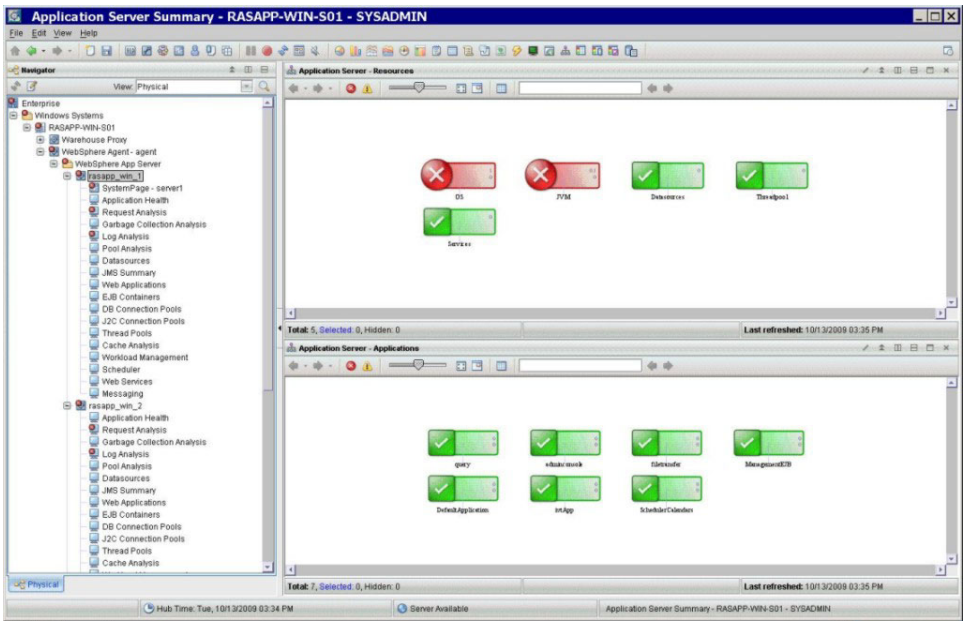
Scenario 4: Determining if the WebSphere cluster needs to be load balanced

Annette, the level 2 operator, gets a number of tickets relating to slow response time for an application. Annette receives an email indicating that the WASHighCPUPercentUsed situation triggered on the WebSphere Application Server where the application is hosted.

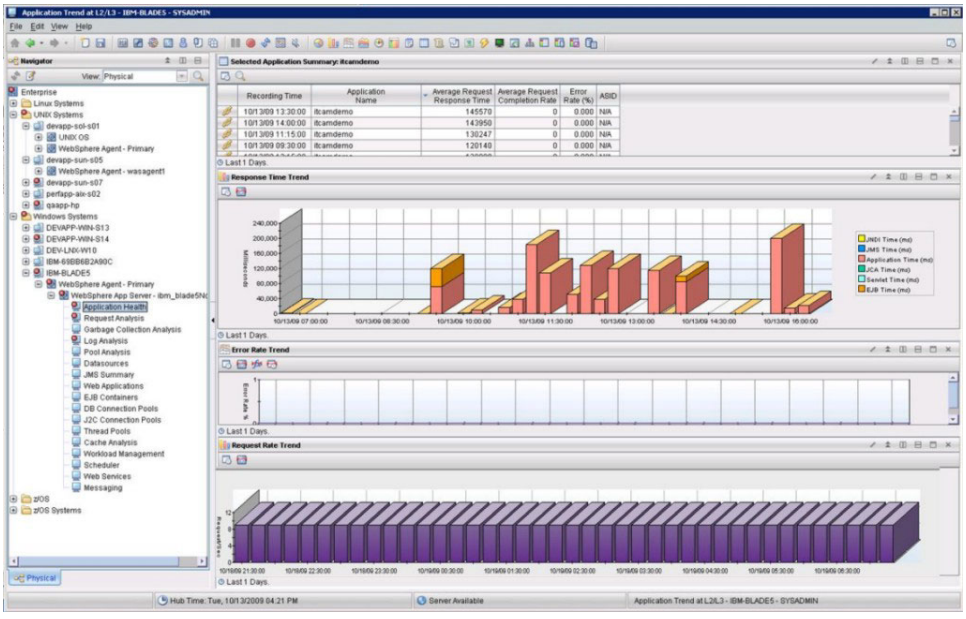
1. Annette navigates to the Tivoli Enterprise Portal and observes that on the WebSphere Agent Summary workspace the **Application** icon is displaying a warning symbol. The **Resources** icon is displaying the critical symbol. The **Resource** icon flyover is displaying high JVM CPU%.



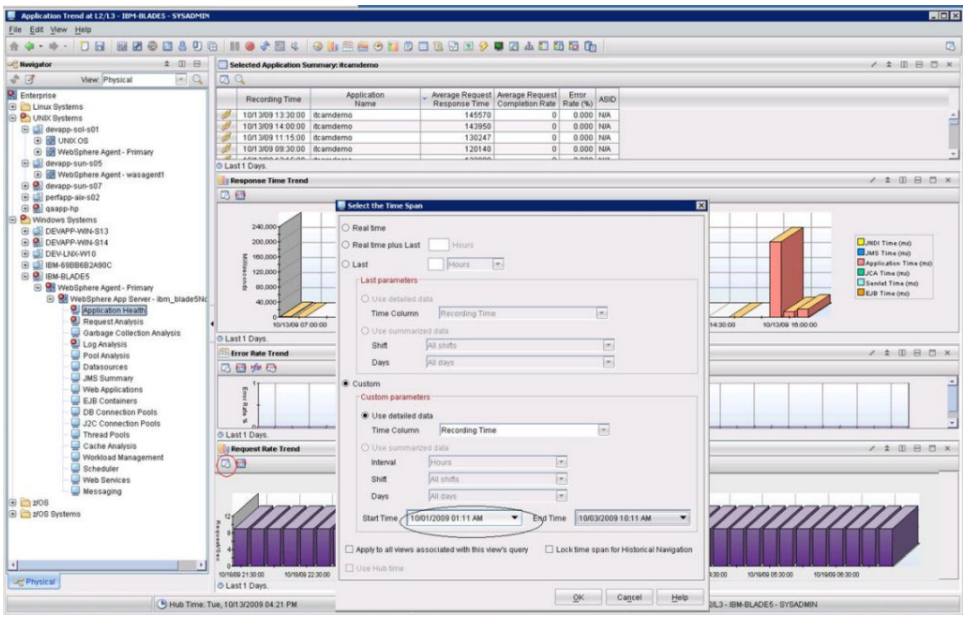
2. Annette double-clicks the **Resources** icon and sees that the **OS** icon and JVM icon are both displaying the critical symbol. The **OS** icon flyover is displaying System CPU (ms) as high. The JVM icon also displays the JVM CPU% as high.



3. Annette double-clicks the **Application** icon. The Application Trend at L2/L3 workspace is displayed. The Selected Application Summary report displays the application name, average request response time, average request completion rate, and error rate. The average request response time is high. The Request Rate Trend chart displays the number of requests that are completed per second for the application. Again, this value is displaying as high.



4. Before Annette escalates this problem, she must determine if the problem is recent or if it has been occurring for some time. Annette checks the trend by taking the following steps in the Request Rate Trend chart:
   a. In the Application Trend at L2/L3 workspace, she selects the **Specify time span for query** icon. The Select the Time Span window is displayed.
   b. In the Custom Parameters section, she enters the required values in the **Start Time** and **End Time** fields. Then, she clicks OK.



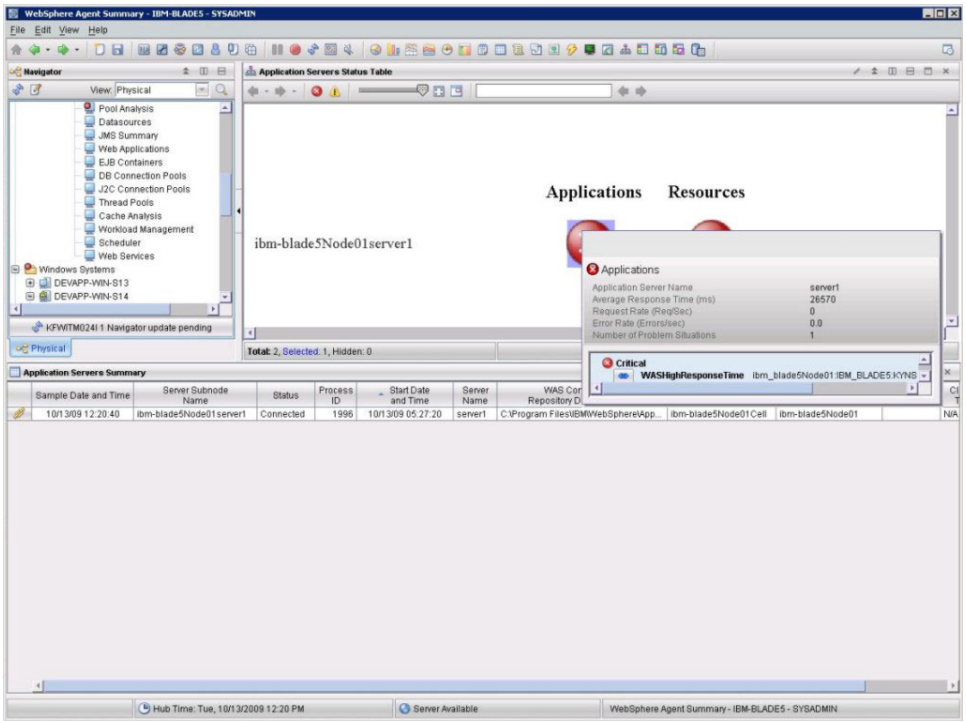
5. Annette observes that there was an increase in client requests a few days ago and that this value has remained high throughout the week. Further investigation reveals that a surge of new customers caused a large increase in new users on the system. As a result, the load on the system is high.
6. Annette uses an external ticketing tool to forward the ticket with all details to Jim, the Middleware/Application Support SME.
7. Jim immediately sees from what Annette has reported that the system is over-burdened because of a significant increase in new users, and that the number of servers that are available in the cluster must be increased. Jim forwards the ticket to Simon, the OS SME.
8. Simon must determine if the Application is running on a static or a dynamic WebSphere cluster. If the application is running on a static cluster, he adds additional application servers. If the application is running on a dynamic cluster, he increases the number of servers allowed. These actions are outside the scope of the agents.

Scenario 5: Determining the cause of high response times

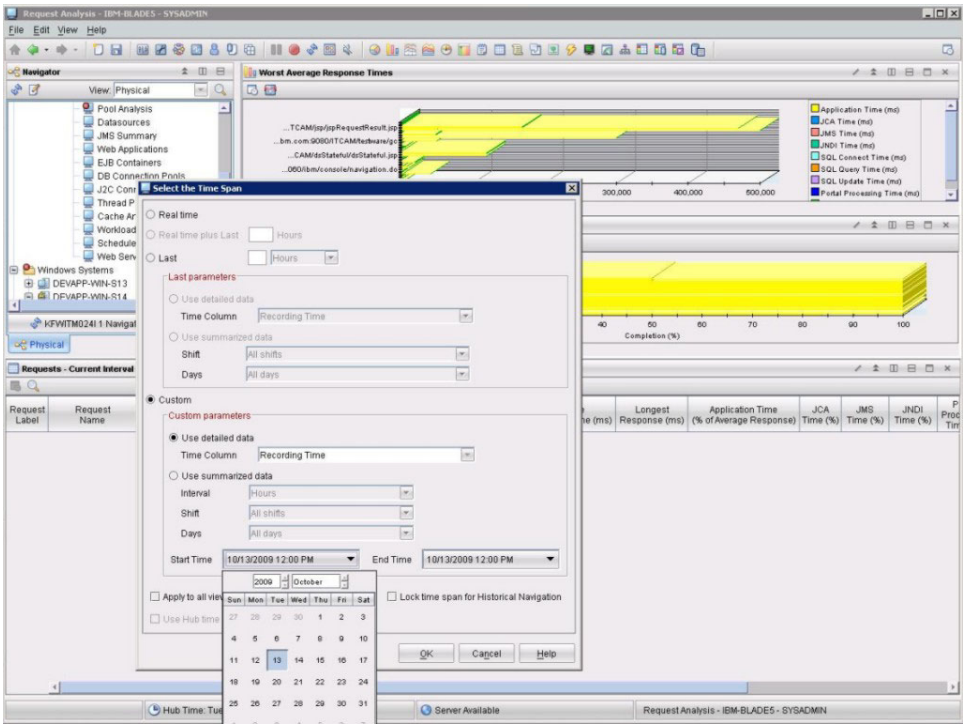
Annette, the level 2 operator, receives an email that indicates that the WASHighResponseTime situation triggered for an application.

Important: This scenario assumes that you have ITCAM for Application Diagnostics, which includes the Managing Server.

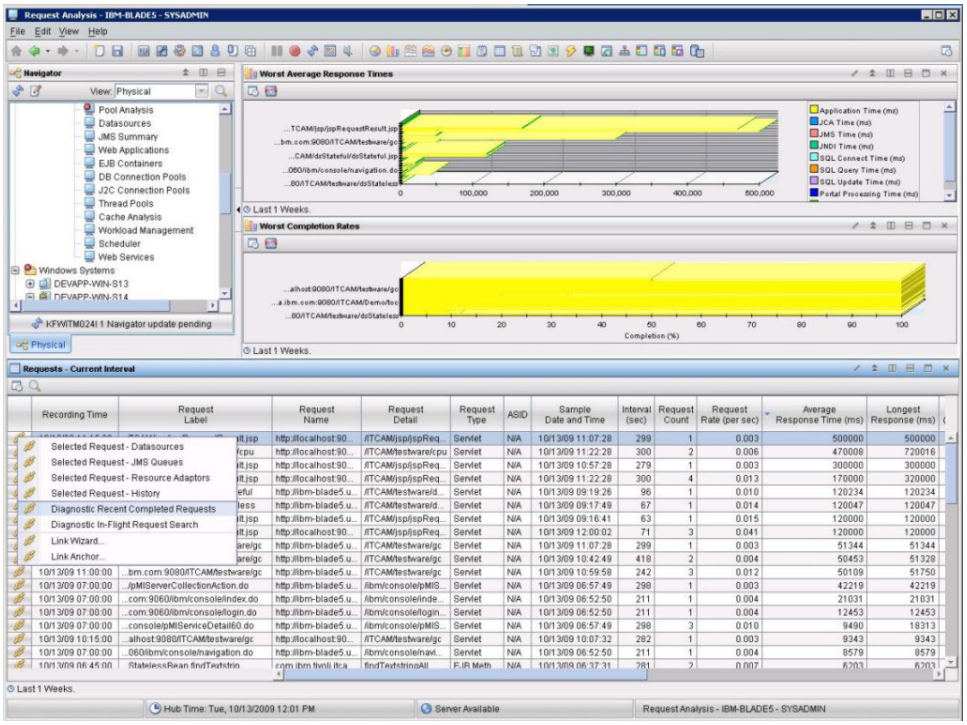
1. Annette navigates to the Tivoli Enterprise Portal and notices in the Application Server Summary workspace that the icon for the application is displaying a critical icon. The flyover for the application indicates that the Average Response time (ms) is high. Annette must determine for how long the response time has been high.



2. Annette double-clicks the **Application** icon. The Application Trend at L1 workspace is displayed. Annette requests historical data by taking the following steps:
   a. In the Requests - Current Interval View, she clicks the Specify time span for query icon. The Select the Time Span window is displayed.
   b. In the Custom Parameters section, she enters the required values in the **Start Time** and **End Time** fields and she clicks OK.
   c. She sorts by the Average Response Time column.

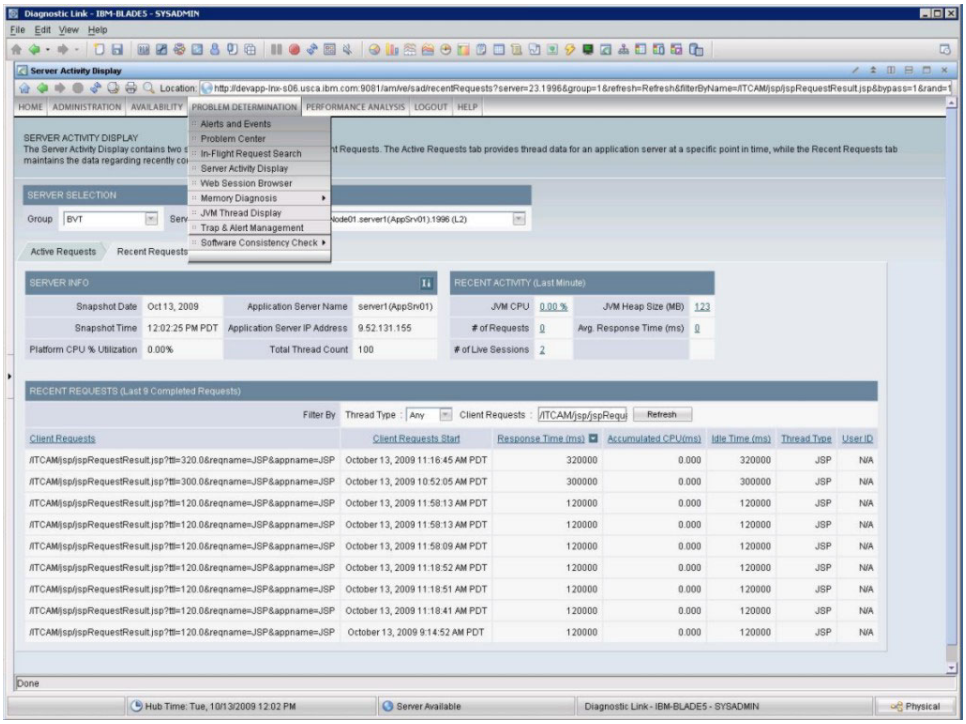


3. Annette uses an external ticketing tool to forward the trend details to Jim, the Middleware/Application Support SME.
4. Jim receives this problem ticket about high response times for a particular application. Jim navigates to the Request Analysis workspace and confirms the problem that Annette described.

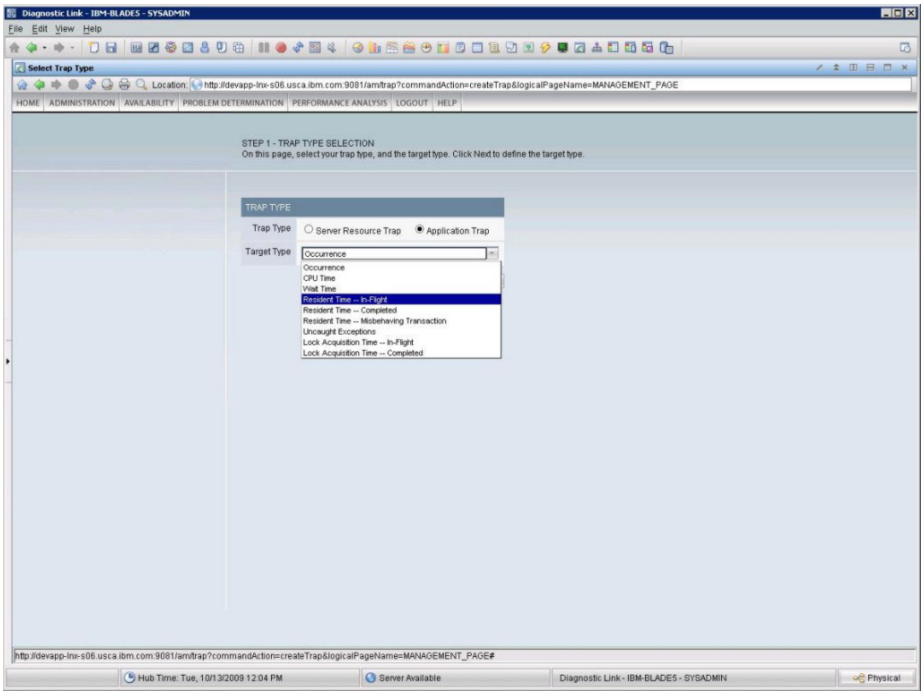


5. To further investigate the problem, Jim must open MSVE. Jim clicks the **Diagnostic Recent Completed Requests** link to open the MSVE Server Activity – Recent Requests page. Only requests that contain the URI information from

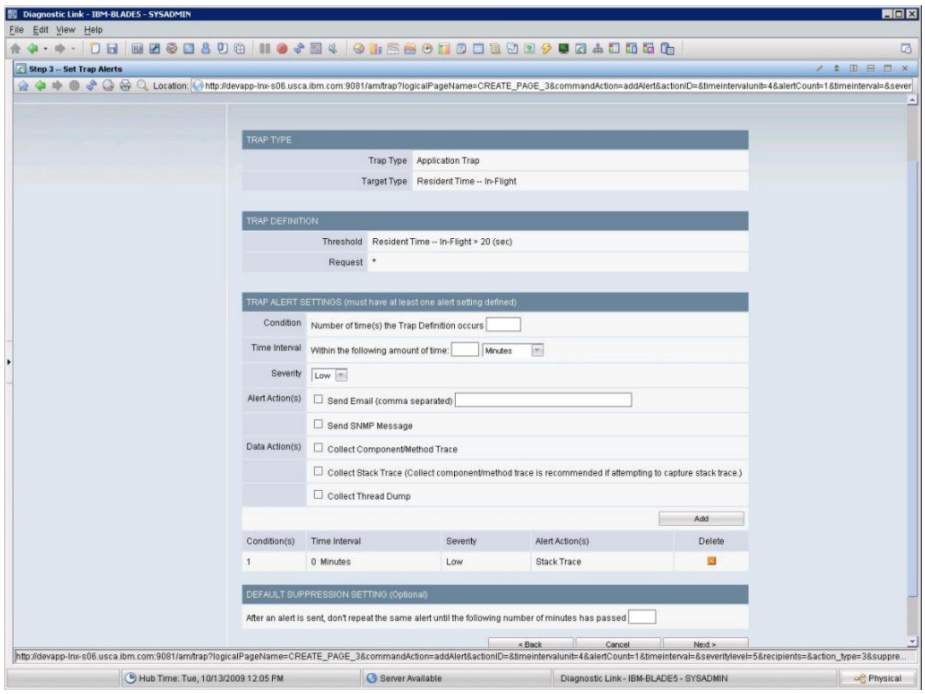
the Request Analysis workspace are displayed. Jim notices that there are a number of client requests with high response times.



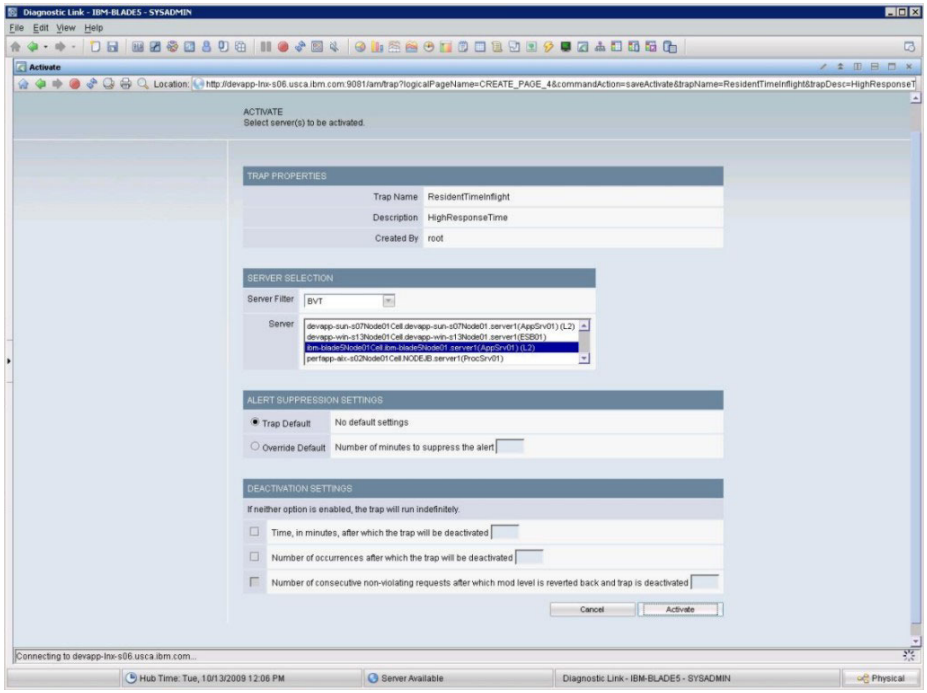
6. Jim decides to further analyze the transactions by setting a Resident Time – In-Flight trap. This trap activates the moment an in-flight request takes longer than a specified amount of time (the minimum is 15 seconds). To set up this trap, Jim must complete the following steps:
   a. Select the trap type.



   b. Set the trap alerts.

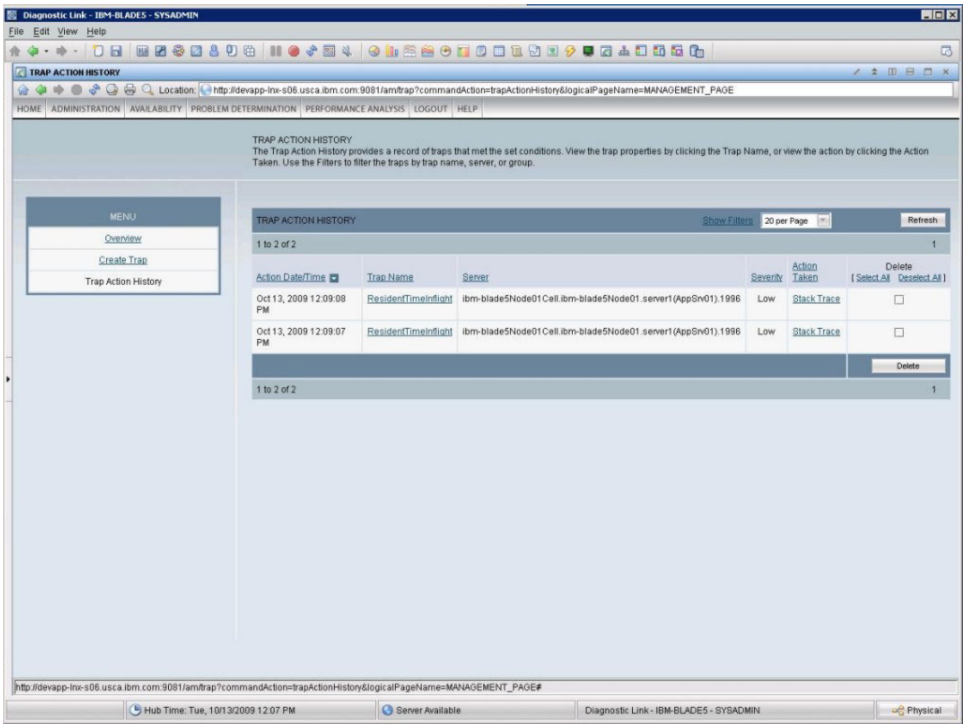


c. Activate the trap.

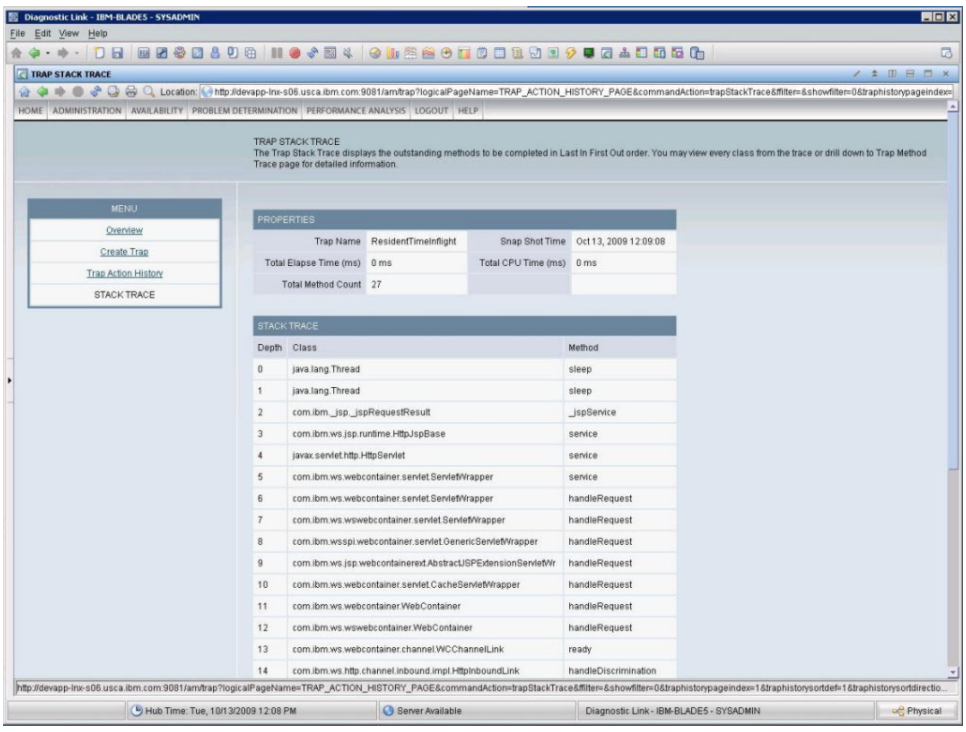


d. Jim then sets an action type of Stack Trace and waits for a problem request to trigger the trap.

7. After a while, the problem request triggers the trap.



8. This trap also produces a stack trace.

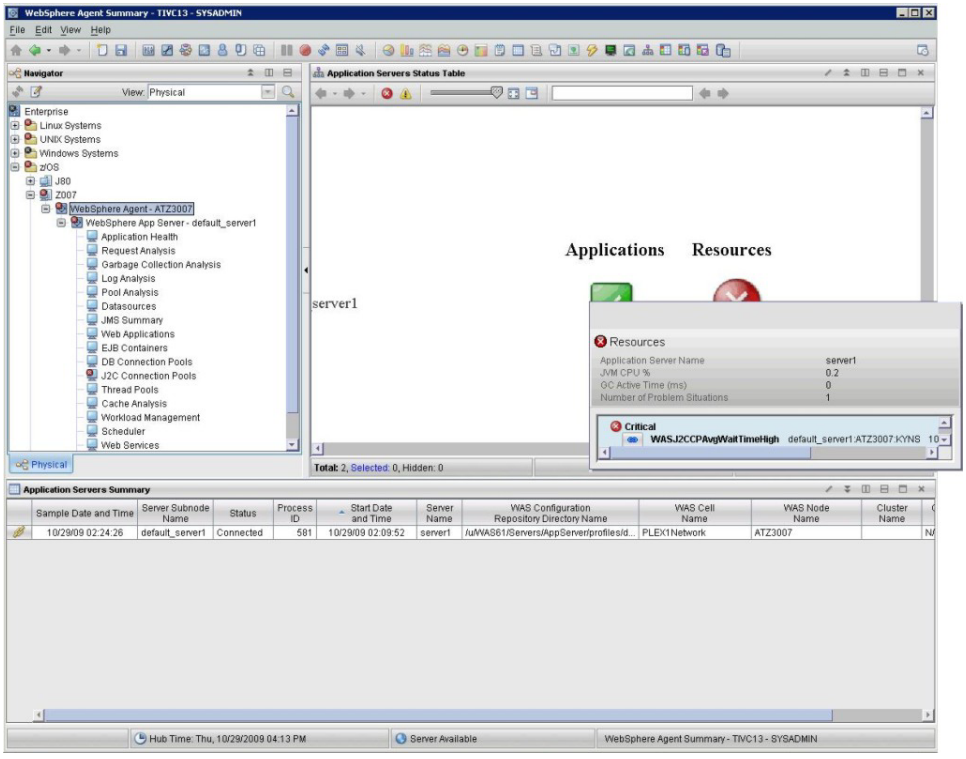


Jim forwards the trouble ticket to Dave, the application developer. Dave works to resolve the problem. This action is outside the scope of ITCAM for Application Diagnostics.

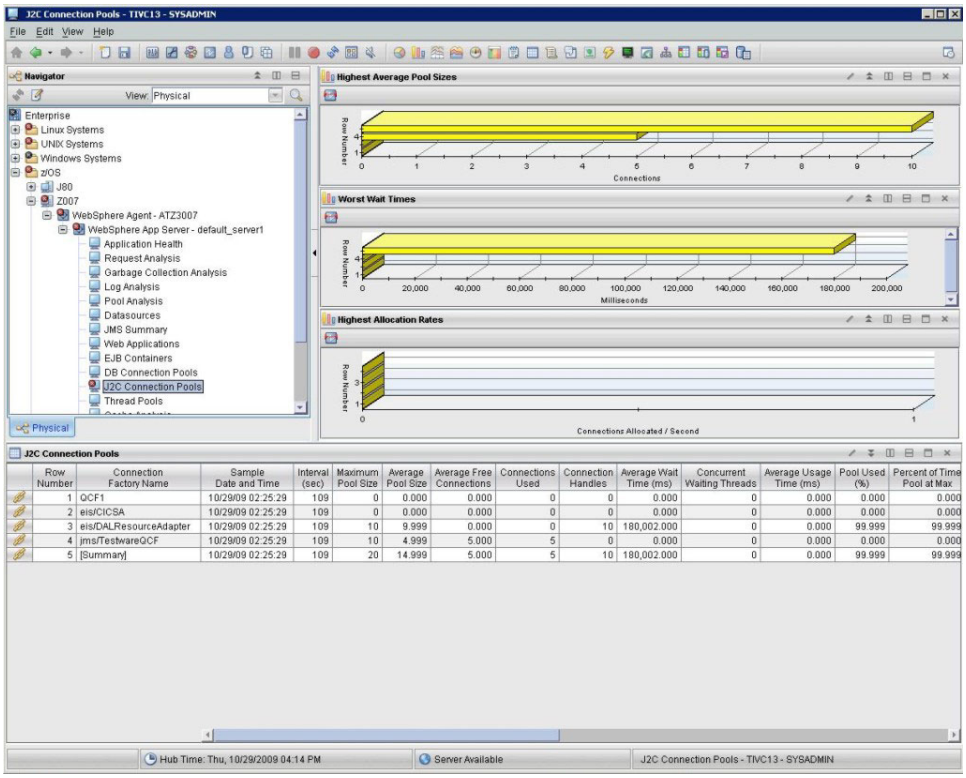
Scenario 6: Determining the cause of connection problems

Annette, the level 2 operator, receives notification that the WASJ2CCPAvgWaitTimeHigh situation triggered. This error is critical. This situation indicates that the average wait time until a connection is granted is longer than 2 seconds.

1. Annette navigates to the J2C Connections Pools workspace. This workspace reports information about resource adapters and connectors that adhere to JEE Connector Architecture (J2C). J2C is the WebSphere Application Server implementation of the Java EE Connector Architecture (JCA). Data counters for this category contain usage information about the J2C connection pools that enable enterprise beans to connect to, and interact with, Enterprise Information Systems.



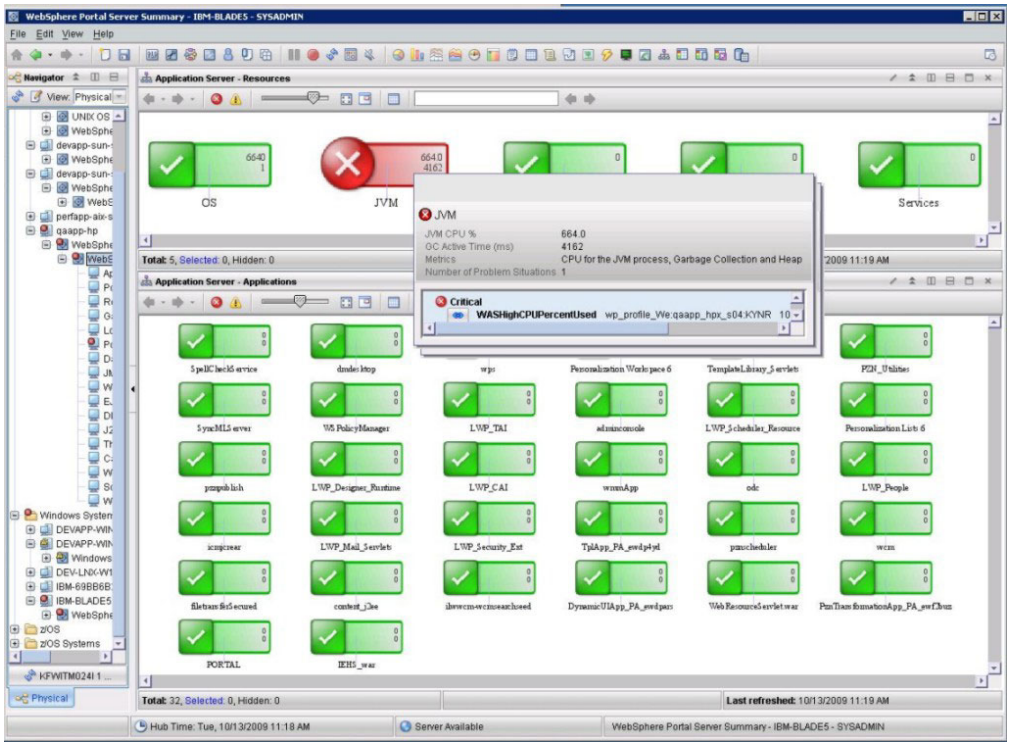
2. In this workspace, Annette observes in the Worst Wait Times view that some wait times for connections are above 2 seconds. The Highest Average Pool Sizes bar chart shows the largest average number of managed connections for each J2C connection pool. Typically, a connection takes no longer than 2 seconds.



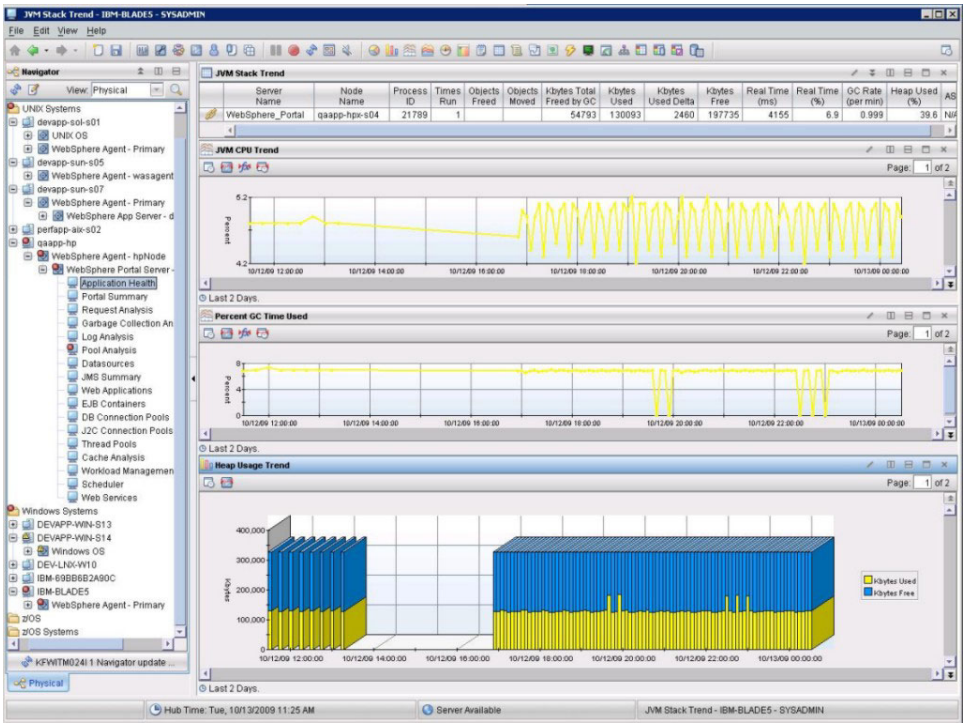
3. Annette uses an external ticketing tool to forward the ticket with details to Jim, the Middleware/Application Support SME.
4. Jim navigates to the J2C Connections Pools workspace and compares the average pools size with the maximum pool size to establish the ideal maximum value. Jim establishes that the connection pool size must be adjusted. The procedure for making this adjustment is outside the scope of the agents.

Scenario 7: Determining if the Garbage Collection policy needs to be adjusted

Annette, the level 2 operator, is monitoring the Tivoli Enterprise Portal. Annette notices a critical symbol on the **JVM** icon in the Application Server Summary workspace. The flyover for **JVM** icons shows a high metric for JVM CPU% and GC Active Time (ms).



1. Annette double-clicks the **JVM** icon. The JVM Stack Trend workspace is displayed. The Percent GC Time Used view displays a high value. The heap usage trend is also high.



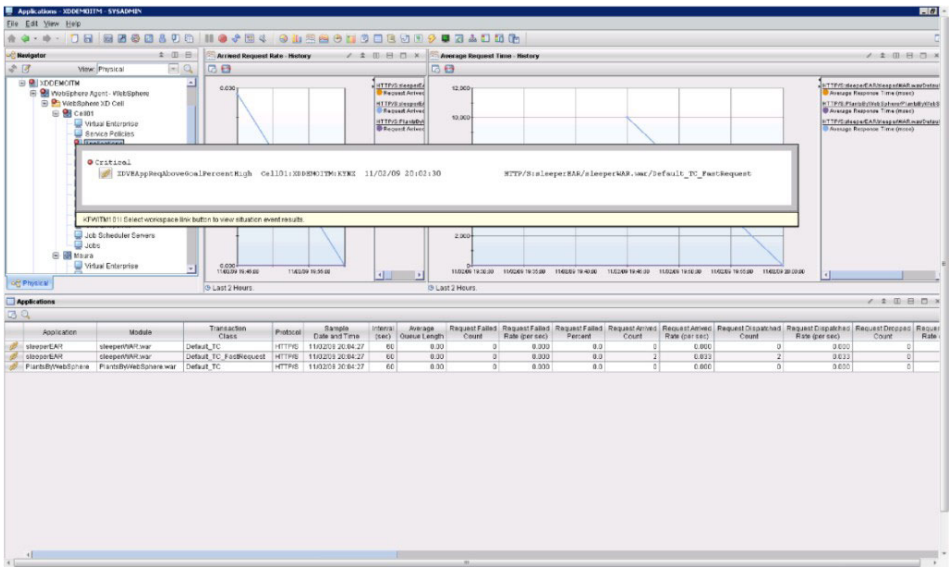
2. Annette uses an external ticketing tool to forward the ticket with details to Jim, the Middleware/Application Support SME.

3. Jim reviews the information and determines that the heap size parameters in the JVM are not set correctly. This incorrect setting affects application performance. Jim sets the appropriate GC policy.

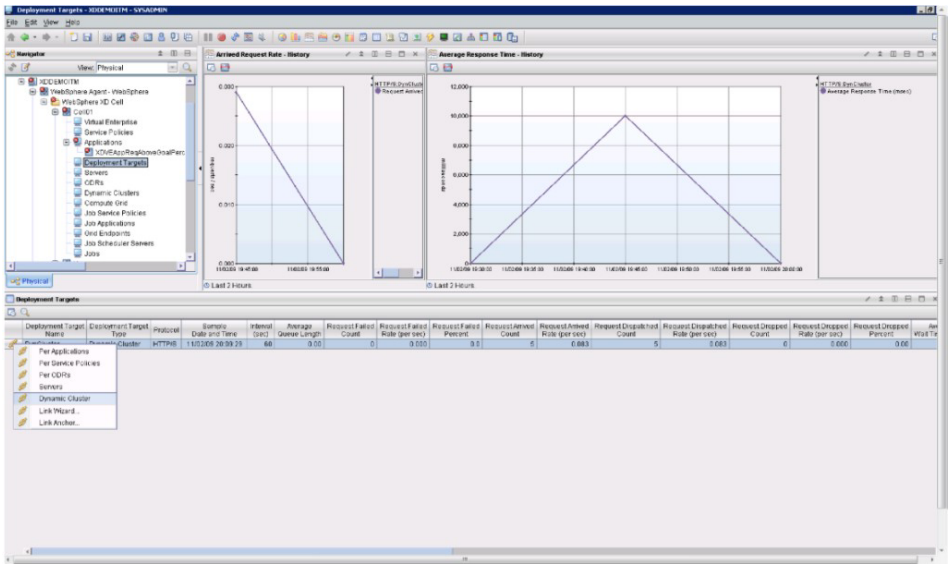
Scenario 8: Troubleshooting application response time in an XD cell

Due to external resource, the response time for one of applications in the XD cell degrades below the service policy goal. Annette, the level 2 operator, receives an email indicating that the Application Requests Above Goal situation triggered. This situation triggers when the rate of requests above goal is greater than 0.5%.

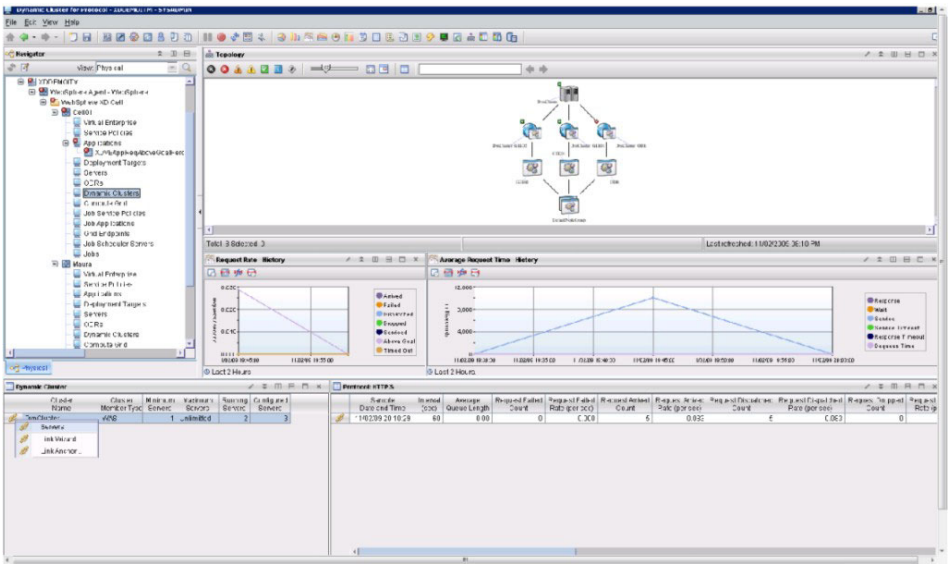
1. In the Tivoli Enterprise Portal navigation tree, Annette follows the workspace link for the triggered situation. The XDVEAppReqAboveGoalPercentHigh Event workspace is displayed.
2. Annette navigates by a link from the XDVEAppReqAboveGoalPercentHigh Event workspace to the Application workspace.



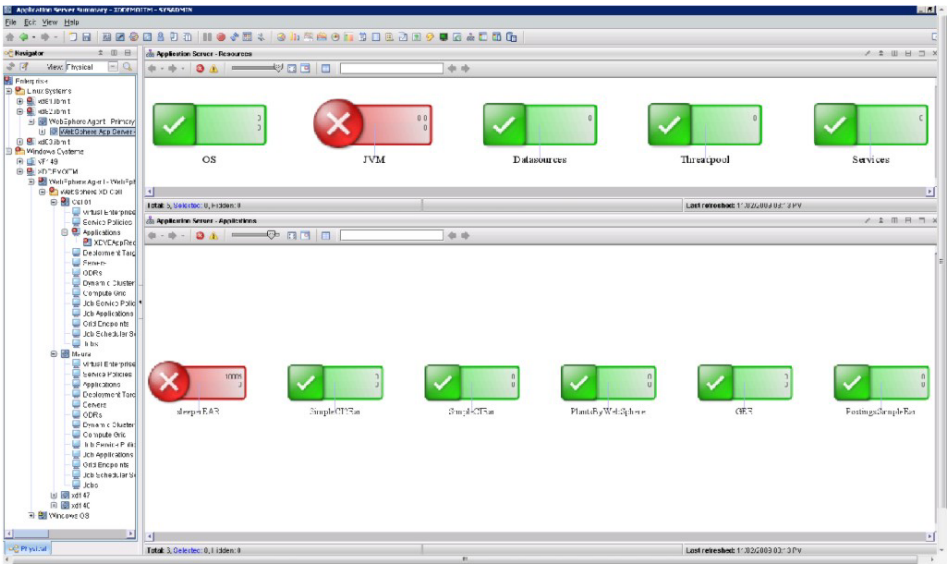
3. The Application workspace displays On Demand Router Statistics (ODR) for the selected application module, transaction, class, and protocol summarized over all ODRs in the cell.
4. From the Application workspace, Annette observes that the average overall response time is 20 seconds and the average server service time is also 20 seconds. This indicates that a problem is occurring with the handling requests by this application.
5. To see the deployment targets hosting the application and to ascertain which of the deployment targets is contributing to the slow response time, Annette navigates to the Deployment Targets workspace using the Per Deployment Targets link.



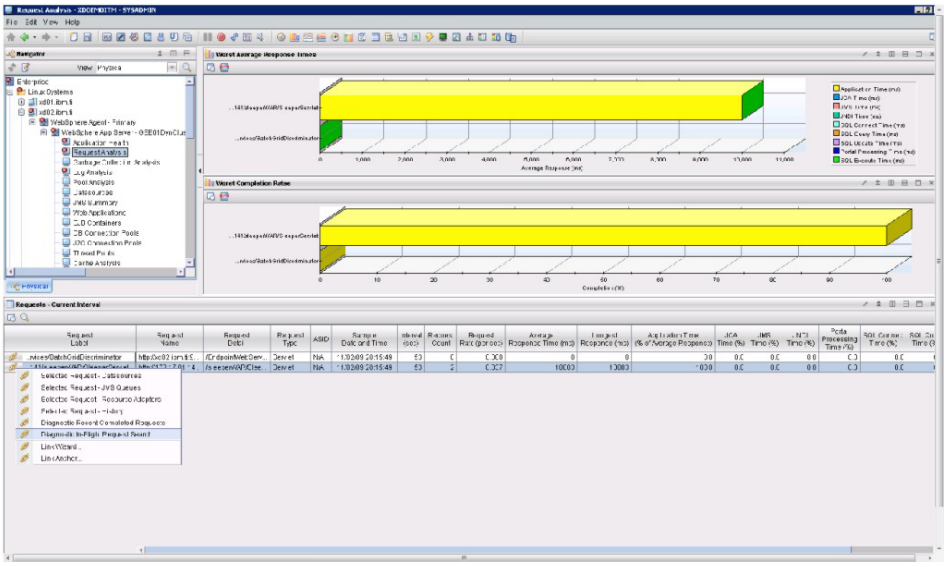
6. The Deployment Targets workspace displays a single deployment target for this application: DynCluster. Annette navigates to this dynamic cluster using the link and then to servers belonging to the dynamic cluster.
7. The servers for the dynamic cluster performance are displayed. From this view, Annette observes that both servers in the dynamic cluster have similar loading. Annette navigates to each server and observes that both have requests higher than the set goal of 10 seconds.



8. Annette navigates to Server Diagnostic for one of the servers using the link, which opens the data collector workspace for that server. Annette observes in the workspace that the sleeperEAR application is displaying a red critical icon.

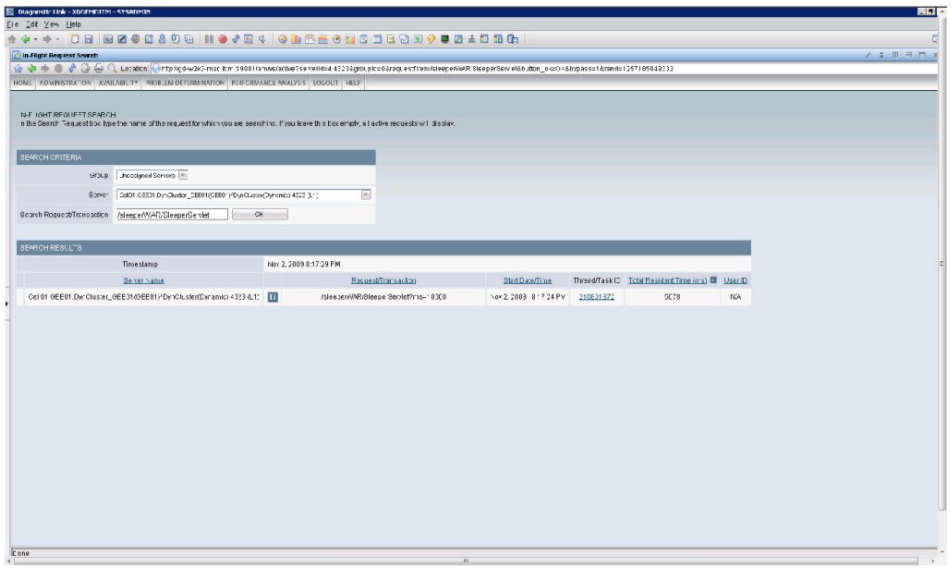


9. Annette double-clicks the application to open the Request Analysis workspace.



10. From the Request Analysis workspace, Annette navigates to the MSVE using the Diagnostic In-Flight Request Search link. From the MSVE, Annette can navigate to the thread for the selected request and view the request call stack.

    Important: This step is only available if you have ITCAM for Application Diagnostics, which includes the Managing Server.

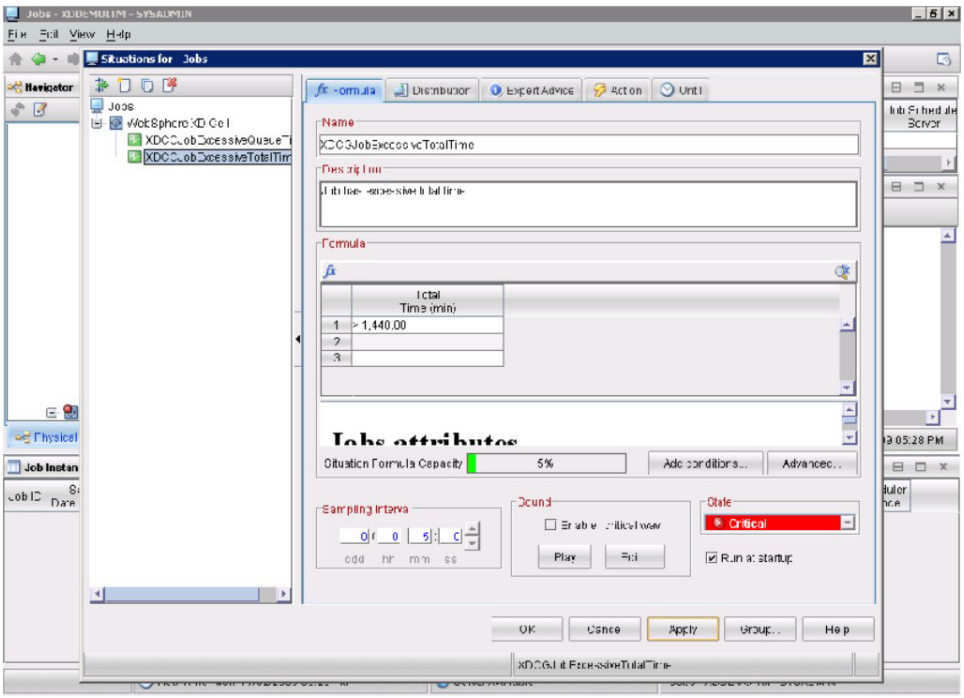


11. Annette uses an external ticketing tool to forward the ticket with details to Jim, the Middleware/Application Support SME.
12. Jim reviews the information and determines that the application waits for response from an external system. Jim researches and resolves the external system issue and restores the application response time before it affected most of the users.

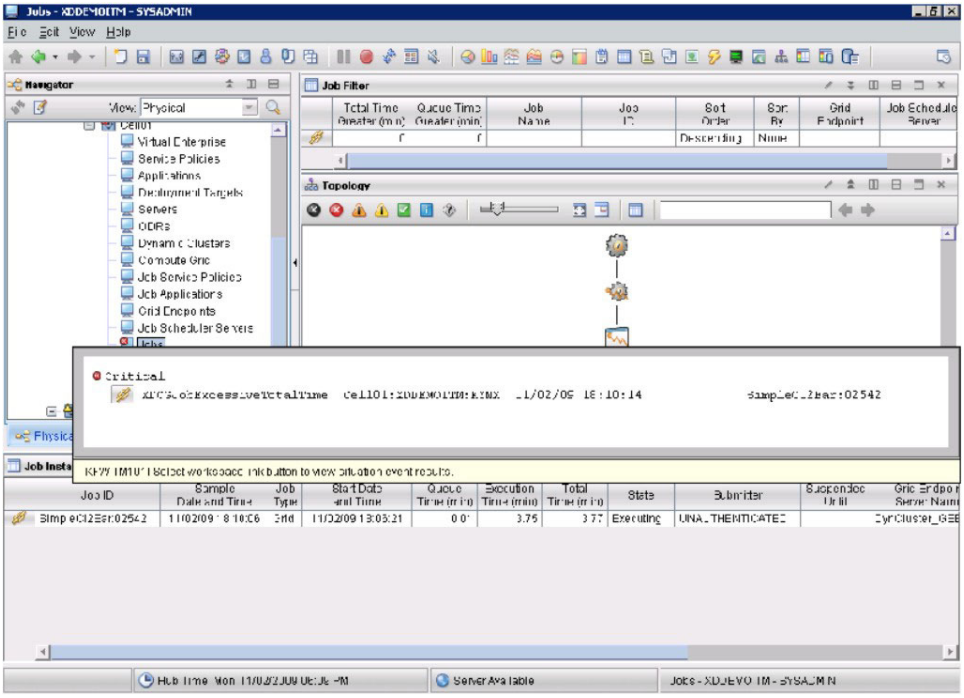
Scenario 9: Ensuring that jobs processed by Compute Grid do not execute for longer than one hour

Annette, the level 2 operator, must ensure that jobs processed by Compute Grid do not run for a longer period of time than one hour. If a job executes for longer, then Annette must capture the job information and forward it to the Middleware/Application Support SME.

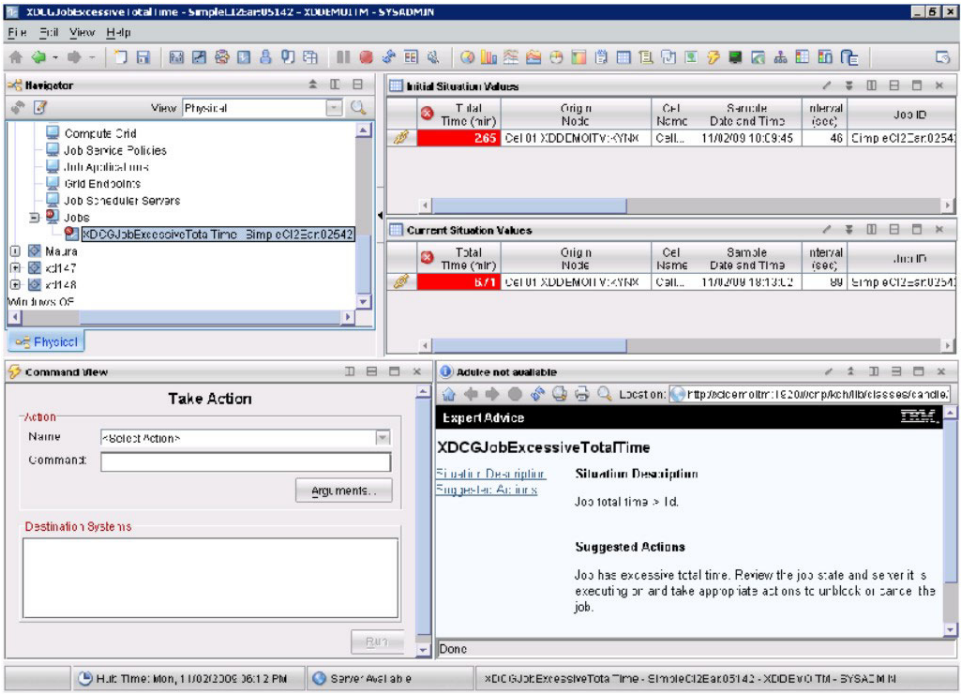
1. Middleware/Application Support SME configure jobs as custom requests via data collector configuration files.
2. Annette edits the predefined XDCGJobExcessiveTotalTime situation to trigger if the total job time is greater than 60 minutes.



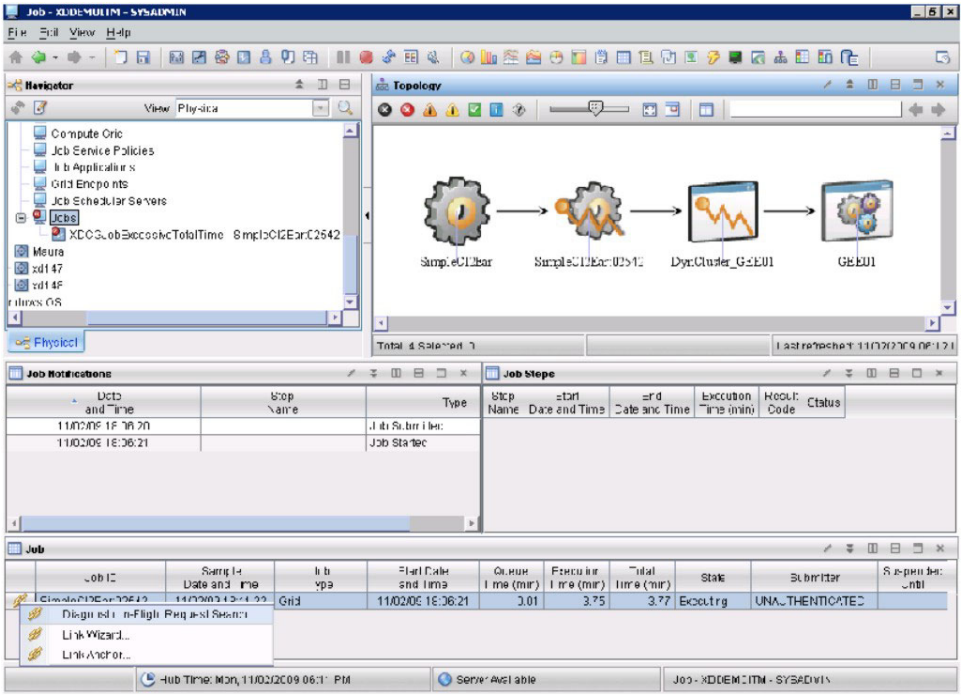
3. At some point, Annette observes that the situation triggered.



4. Annette clicks the event link and the Event workspace is displayed.



5. Annette opens the Job workspace by using the link from the Event workspace.



6. The Job workspace shows all the details about the job. From the job notifications, Annette observes that the job is running for a long time. She clicks the **Diagnostic in-Flight Request Search** link to open the MSVE in-flight workspace; from here, she clicks the link to see the request call stack.
7. Annette captures the call stack and provides to Jim, the Middleware/ Application Support SME.
8. Jim determines that job is waiting for database lock and resolves it appropriately.

Part 2. Part 2: Using the agents

Chapter 3. ITCAM Agent for WebSphere Applications

IBM Tivoli Composite Application Manager Agent for WebSphere Applications provides a Systems Management solution for the WebSphere application server Versions 7, 8 and 8.5. Using the agent, you can monitor multiple WebSphere application servers running on the same physical node. Each application server must have been configured with its own ITCAM Data Collector for WebSphere.

IBM Tivoli Composite Application Manager Agent for WebSphere Applications is a component of ITCAM for Application Diagnostics Version 7.1 and later. It is also a component of ITCAM for Applications Version 7.2. If you are using ITCAM for Applications, the managing server (deep dive) functionality is not available; ignore all references to this functionality in this document.

The Tivoli Enterprise Monitoring agent collects four types of data through the data collector embedded in the WebSphere Application server process:

- Data for application server requests from the ITCAM Data Collector for WebSphere
- Resource data from WebSphere Performance Monitoring Infrastructure (PMI)
- Data from WebSphere log files
- Process data from the operating system

Initiating data collection and the reporting of data

Because of high processor usage, some data items are not automatically collected and reported. The collection of some data and statistics depends upon the setting of instrumentation levels for certain attributes. If the instrumentation levels are not set appropriately, certain information is not collected and displayed in the workspaces. Similarly, those attributes that collect request and application trace data require you to complete several configuration steps. If you need to collect these data, use one of these methods to reconfigure data collection:

- Complete configuration steps (as explained in the ITCAM Agent for WebSphere Applications installation and customization guide).
- Issue Take Action commands to take specific action against your WebSphere application server or the monitoring product using the Tivoli Enterprise Portal.
- Use Manage Tivoli Enterprise Services (as explained in the various IBM Tivoli Monitoring installation manuals and the ITCAM Agent for WebSphere Applications installation and customization guide).

Automatic baselining

To display application health status, ITCAM monitors request response times (averaged over a sampling interval, by default 60 seconds) for every application. Every top-level request available in an application is monitored separately.

For every request, two *thresholds* are set, known as *fair* and *bad*. Response time below both thresholds is considered *good*. When at least one average request response time for an application rises over the fair threshold, a health warning (indicated with an exclamation mark symbol) for this application is reported. In the same way, when at least one average request response time rises over the bad threshold, an application health alarm (indicated with an x symbol) is reported.

ITCAM also monitors the "nested" requests (for example, database calls) within every top-level request. In the event of a warning or alarm, it checks which of the nested requests is taking more than its usual share of time. Depending on the type of such nested requests, ITCAM shows whether the client, application, or backend tier is the likely cause of the warning/alarm. Servlet and Portal request types are assigned to the client tier; EJB and User (Custom) request types, to the application tier; all other request types (JNDI, JDBC, JCA, JMS) to the backend tier.

Important: Baselining is currently not supported for SCA requests.

When ITCAM starts to monitor a new application, it automatically starts a *baselining process*. This process normally runs for seven days and provides updated information every hour from the beginning. During the process, ITCAM collects statistical data for all requests in this application. Once the data is collected, ITCAM sets the thresholds automatically; it also records the typical share of response time for each nested request type.

In most cases, this automatic setting is adequate. During the baselining process, the baselines get updated periodically, and the alarms/warnings start to correspond to real problems. There is no need to adjust baselining settings when things are working normally. (The automatic thresholds usually become usable earlier, after the application has been observed through its typical load patterns). If you need to acquire thresholds, based on whatever data is available, before the hourly automatic update, you can manually update baselining.

However, in some situations the threshold levels can become inadequate. This results in either too many false alarms/warnings, or in real problems going undetected. Such situations can be broadly split into two categories:

- If some time has passed since the baselining process for an application, its response times might have changed because of configuration alteration, database growth, changing load patterns, and so on. In this case, you might need to run the baselining process again. It is good practice to do it after any configuration or infrastructure change.
- If the thresholds are incorrect immediately after the baselining process has been completed, you might have to adjust the auto threshold settings.

As a last resort, you can also override the thresholds with fixed values. However, do not do this unless you know a lot about the monitored application, or unless instructed by IBM Level 3 Support.

If you need to have the thresholds set before they are updated automatically for the first time, you can trigger a baseline update. This immediately sets the thresholds based on the request data collected so far.

Additional information

For additional usage information about this agent, see:

- Workspaces
- Attributes
- Situations
- Take Action commands

Workspaces for ITCAM Agent for WebSphere Applications

As part of the IBM Tivoli Composite Application Manager Agent for WebSphere Applications product integration with the Tivoli Enterprise Portal, workspaces offer views of monitoring data that provide detailed current data about WebSphere application servers running on Linux, UNIX, and Windows and z/OS platforms on your site. In addition to reports and graphs, a workspace can contain other views (that is, windows), such as a Notepad editor session, a browser session, a telnet session, an event console, or a Take Action view from which you can issue commands.

Several views of high-level information

Several workspaces provide high-level information to help you meet the monitoring and administrative needs of your site. These workspaces report on status and availability for both the WebSphere administrative server and its application server instances. They allow you to easily monitor the availability of your enterprise, the WebSphere application server, and application server instances.

Primary and secondary workspaces

The workspaces listed in the Navigator are directly accessible and are thus termed *primary workspaces*. Some of these also contain *secondary workspaces*, which are not accessible directly from the Navigator. Instead, you must select and display the primary workspace. Then, use either a menu option or a special link icon in the primary workspace views to reach the secondary workspaces (sometimes called subsidiary workspaces).

Workspaces with historical data links

Several workspaces provide secondary workspaces that display historical data. You can specify a time span over which to collect historical data, which accumulates and summarizes the data in the primary workspaces that generate them. (The default setting is 15 minutes; you can modify this setting to suit your needs.) The descriptions of the historical workspaces follow the descriptions of the primary workspaces that generate them in the workspace helps.

Available Tivoli Enterprise Portal workspaces

For an overview of the organization of the available workspaces, see Organization of the predefined workspaces.

Organization of the predefined workspaces

The IBM Tivoli Composite Application Manager Agent for WebSphere Applications workspaces for the Tivoli Enterprise Portal define data displays that appear in the Navigator Physical view. In addition to the workspaces that the Navigator lists, you can reach their subsidiary (that is, secondary) workspaces from the primary workspaces (those listed in the Navigator).

Accessing the subsidiary workspaces

You can access the subsidiary workspaces of a primary workspace by using one or more of the following methods:

From the Navigator:

1. Select the primary workspace.
2. Right-click the name of the selected workspace in the Navigator.
3. Select **Workspaces** from the menu.
4. Select the desired subsidiary workspace.

From the View menu:

1. Select the primary workspace.
2. From the menu bar, select **View > Workspaces**.
3. Select the desired subsidiary workspace.

From a report:

1. Select the primary workspace.
2. If the workspace report contains a link icon, click the icon to navigate to the default subsidiary workspace pertaining to the selected row or right-click the icon and select a subsidiary workspace from the menu.

From a chart view:

The data displayed in some bar charts and plot charts is linked to subsidiary workspaces. To search for a link, right-click a bar or data point in the chart. If **Link to** displays in the menu, you can select a subsidiary workspace pertaining to the data in the chart.

Workspace organization

The hierarchy levels shown in the Navigator depend on how your enterprise customizes the Tivoli Enterprise Portal. However, ITCAM Agent for WebSphere Applications does provide a set of predefined workspaces, which do not require customization. The following list shows the order and hierarchy of the predefined workspaces provided by the ITCAM Agent for WebSphere Applications. It is a representation of how the predefined workspaces are organized in the Navigator. For more detailed information about a workspace, click its name in the table.

Important: Some workspaces are only available when running a monitoring agent in a z/OS environment. For more information, see "Region workspaces in a z/OS environment" on page 136.

operating system [for example, Windows]

- *system* [that is, node name]
  - WebSphere Agent
    - "WebSphere agent summary workspace" on page 49
    - "WebSphere agent summary status workspace" on page 49
    - "Application Server Summary and Business Process Manager Summary workspaces" on page 50
    - "Configuration workspaces" on page 57

- "WebSphere application server workspace" on page 129
- "Resources and Applications workspaces" on page 53
- "High Availability Manager workspace" on page 92
- "DCS Stacks workspace" on page 84
- "Configuration workspaces" on page 57

-

- Application Health
  - Application Registry
  - Application Trend at L1
  - Application Trend at L2/L3
  - OS Stack
  - JVM Stack Trend
  - "Web Tier Analysis workspace" on page 113
  - "Backend Tier Analysis workspace" on page 112
  - "Request Baseline workspace" on page 109
  - "Application Configuration workspace" on page 111
  - "EJB Tier Analysis workspace" on page 110
  - "Application Health History workspace" on page 113
  - "Selected Request - Service Components workspace" on page 117
- Request Analysis
  - Selected Request - Datasources
  - Selected Request JMS Queues
  - Selected Request Resource Adapters
  - Selected Request - History
  - "Selected Request - Service Components workspace" on page 117
  - "Service Components workspace" on page 119
- Garbage Collection Analysis
  - Allocation Failures
  - Garbage Collections - Selected Allocation Failure
- Log Analysis
- Pool Analysis
- Datasources
  - "Data sources workspace" on page 80
  - "Selected Datasources - Datasource Trend workspace" on page 114
- JMS Summary
- Web Applications
  - Sessions
  - Servlets / JSPs - Selected Enterprise Application
- EJB Containers
  - Container Object Pools
  - Container Transactions
  - Enterprise Java Beans
- DB Connection Pools
  - Selected DB Connection Pool - History
- J2C Connection Pools

    - Thread Pools
      - "Thread Pool Trend workspace" on page 124
      - Alarm Manager
    - Cache Analysis
      - "Thread Pool Trend workspace" on page 124
      -
    - Workload Management
    - Scheduler
    - Web Services
      - Selected Web Services - History
    - Messaging Engines
      - Client Communications
      - Messaging Engine Communications
      - WMQ Client Link Communications
      - WMQ Link Communications
      - Destinations
        - Durable Subscriptions
- WebSphere Portal Server
    - "Application Server Summary and Business Process Manager Summary workspaces" on page 50
    - "Configuration workspaces" on page 57
      - "WebSphere application server workspace" on page 129
      - "Resources and Applications workspaces" on page 53
      - "High Availability Manager workspace" on page 92
      - "DCS Stacks workspace" on page 84
      - "Configuration workspaces" on page 57
    - Portal Summary
    -
      - Portlet Summary
        - Selected Portlet - History
      - Portal Pages Summary
        - Selected Portal Page - History
    - Request Analysis
      - Selected Request - Datasources
      - Selected Request JMS Queues
      - Selected Request Resource Adapters
      - Selected Request - History
    - Garbage Collection Analysis
      - Allocation Failures
      - Garbage Collections - Selected Allocation Failure
      -
    - Log Analysis
    - Pool Analysis
    - Datasources
      - "Data sources workspace" on page 80

        - "Selected Datasources - Datasource Trend workspace" on page 114
    - JMS Summary
    - Web Applications
        - Sessions
        - Servlets / JSPs - Selected Enterprise Application
    - EJB Containers
        - Container Object Pools
        - Container Transactions
        - Enterprise Java Beans
    - DB Connection Pools
        - Selected DB Connection Pool - History
    - J2C Connection Pools
    - Thread Pools
        - Alarm Manager
    - Cache Analysis
    - Workload Management
    - Scheduler
    - Web Services
        - Selected Web Services - History
- WebSphere ESB Server
    - Application Health Summary
        - Selected Application - Application Tier Analysis
        - Selected Application - Configuration
        - Selected Application - Backend Tier Analysis
        - Selected Application - Health History
        - Selected Application - Client Tier Analysis
        - Application Registry
            - Selected Request - Baseline
    - High Availability Manager
    - DCS Stacks
    - Request Analysis
        - Selected Request - Datasources
        - Selected Request JMS Queues
        - Selected Request Resource Adapters
        - Selected Request - History
        - "Selected Request - Service Components workspace" on page 117
        - "Service Components workspace" on page 119
    - Garbage Collection Analysis
        - Allocation Failures
        - Garbage Collections - Selected Allocation Failure
    - Log Analysis
    - Pool Analysis
    - Datasources
        - Selected Datasource - History
    - JMS Summary

    - Web Applications
      - Sessions
      - Servlets / JSPs - Selected Enterprise Application
    - EJB Containers
      - Container Object Pools
      - Container Transactions
      - Enterprise Java Beans
    - DB Connection Pools
      - Selected DB Connection Pool - History
    - J2C Connection Pools
    - Thread Pools
      - Alarm Manager
    - Cache Analysis
    - Workload Management
    - Scheduler
    - Web Services
      - Selected Web Services - History
    - Messaging Engines
      - Client Communications
      - Messaging Engine Communications
      - WMQ Client Link Communications
      - WMQ Link Communications
      - Destinations
        - Durable Subscriptions
    - Service Components
      - Service Component Elements
- WebSphere Process Server
    - Application Health Summary
      - Selected Application - Application Tier Analysis
      - Selected Application - Configuration
      - Selected Application - Backend Tier Analysis
      - Selected Application - Health History
      - Selected Application - Client Tier Analysis
      - Application Registry
        - Selected Request - Baseline
    - High Availability Manager
    - DCS Stacks
    - Request Analysis
      - Selected Request - Datasources
      - Selected Request JMS Queues
      - Selected Request Resource Adapters
      - Selected Request - History
      - “Selected Request - Service Components workspace” on page 117
      - “Service Components workspace” on page 119
    - Garbage Collection Analysis

        - Allocation Failures
        - Garbage Collections - Selected Allocation Failure
    - Log Analysis
    - Pool Analysis
    - Datasources
        - Selected Datasource - History
    - JMS Summary
    - Web Applications
        - Sessions
        - Servlets / JSPs - Selected Enterprise Application
    - EJB Containers
        - Container Object Pools
        - Container Transactions
        - Enterprise Java Beans
    - DB Connection Pools
        - Selected DB Connection Pool - History
    - J2C Connection Pools
    - Thread Pools
        - Alarm Manager
    - Cache Analysis
    - Workload Management
    - Scheduler
    - Web Services
        - Selected Web Services - History
    - Messaging Engines
        - Client Communications
        - Messaging Engine Communications
        - WMQ Client Link Communications
        - WMQ Link Communications
        - Destinations
            - Durable Subscriptions
    - Service Components
        - Service Component Elements
- Lotus® Workplace Server
    - Application Health Summary
        - Selected Application - Application Tier Analysis
        - Selected Application - Configuration
        - Selected Application - Backend Tier Analysis
        - Selected Application - Health History
        - Selected Application - Client Tier Analysis
        - Application Registry
            - Selected Request - Baseline
    - High Availability Manager
    - DCS Stacks
    - Workplace Mail

  - IMAP/POP
  - Messages Queues
- Portal Summary
  - Portlet Summary
    - Selected Portlet - History
  - Portal Pages Summary
    - Selected Portal Page - History
- Request Analysis
  - Selected Request - Datasources
  - Selected Request JMS Queues
  - Selected Request Resource Adapters
  - Selected Request - History
- Garbage Collection Analysis
  - Allocation Failures
  - Garbage Collections - Selected Allocation Failure
- Log Analysis
- Pool Analysis
- Datasources
  - Selected Datasource - History
- JMS Summary
- Web Applications
  - Sessions
  - Servlets / JSPs - Selected Enterprise Application
- EJB Containers
  - Container Object Pools
  - Container Transactions
  - Enterprise Java Beans
- DB Connection Pools
  - Selected DB Connection Pool - History
- J2C Connection Pools
- Thread Pools
  - Alarm Manager
- Cache Analysis
- Workload Management
- Scheduler
- Web Services
  - Selected Web Services - History

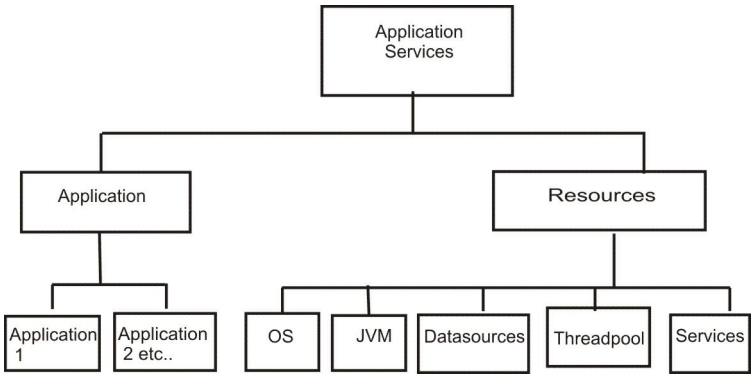
For additional information, see: Attribute groups used by the predefined workspaces

Summary workspaces

You can use summary workspaces to quickly see the status of WebSphere application servers and applications in your enterprise.

About Summary Workspaces

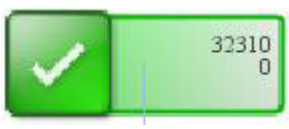
Summary workspaces provide a way to quickly monitor the status of application servers and applications. ITCAM for Application Diagnostics provides predefined situations that you can use to monitor WebSphere application servers in your enterprise. Summary workspaces enable you to quickly determine the status of these situations. User-defined and predefined situations are mapped to various colored icons in the summary workspaces. The icon color indicates status which enables you to quickly determine the overall health of applications servers and applications. The following organization chart shows the structure of the icons in the summary workspaces:



Summary Workspace Icons

In summary workspaces, each icon displays as one of the following statuses: Critical, Warning, Normal, or Unknown. The status is calculated based on the status of the underlying situations being monitored. Each icon also displays the metrics for the first two situations shown on the flyover. The following table shows the possible status of icons:

Table 2. Status Icons

Status Icon	Status
	Critical
	Warning
	Normal
	Unknown or Application Stopped

Summary Workspace Flyovers

The icons indicate the status of the WebSphere application servers and applications in your enterprise. To access more detailed information from the summary workspaces, point to the icon and a flyover is displayed. The flyover provides relevant metrics pertaining to the icon. It also shows the top 10 situations that are linked with the icon. You can go directly to the situation event result workspace by clicking the situation link icon  in the flyover.

Drill Down on Summary Workspaces

You can drill down on the icons to see more information. When you double-click an icon, further workspace views showing more detailed monitoring data are displayed.

See also

"Situations for ITCAM Agent for WebSphere Applications" on page 278

Summary Workspace Views

You can use summary workspaces to quickly see the status of WebSphere application servers and applications in your enterprise. Each workspace can contain one or more views.

There are five summary workspaces. The following table describes the summary workspaces:

Table 3. Summary Workspace Table

Workspace Name	Level in TEP	Views Available
WebSphere Agent Summary	Agent level	• Application Servers Status Table • Application Servers Summary
WebSphere Agent Summary Status	Agent level	• Application Servers Status • Application Servers Summary
application server Summary	application server Level	• application server - Resources • application server - Applications
Resources	application server Level	• application server - Resources • Situation Event Console
Applications	application server Level	• application server - Applications • Situation Event Console

WebSphere agent summary workspace

The WebSphere Agent Summary Workspace provides summary monitoring information for WebSphere application servers in your enterprise. It contains two views, the Application Servers Status Table view and the Application Servers Summary view.

Application Servers Status Table view

Two icons are displayed in this view: the Application and the Resources icons.

The flyover for the Applications icon displays the following metrics:

- application server Name
- Average Response Time (ms)
- Request Rate (Req/Sec)
- Error Rate (Errors/sec)
- Number of problem Situations
- List of top 10 situations

The flyover for the Resources icon displays the following metrics:

- application server Name
- JVM CPU%
- GC Active Time (ms)
- Number of problem Situations
- List of top 10 situations

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

WebSphere agent summary status workspace

The WebSphere Agent Summary Status workspace is an alternative summary workspace available at the WebSphere agent level. The WebSphere Agent Summary Status workspace provides summary monitoring information for WebSphere Application servers.

To switch to the WebSphere Agent Summary Status workspace, right-click the WebSphere Agent in the Tivoli Enterprise Portal navigator and select **Workspace** and then select **WebSphere Agent Summary Status**.

The WebSphere Agent Summary Status workspace contains two views, the Application Servers Status view and Applications Servers Summary view.

Application Servers Status View

In this view, the Server icon indicates the status of both applications and resources. The flyover for the Server icon displays the following metrics:

- Average Response Time (ms)
- Request Rate (Req/Sec)
- Error Rate (Errors/sec)
- JVM CPU%
- GC Active Time (ms)

- WAS Node Name
- WAS Cell Name
- WAS Cluster Name
- Number of Problem Situations
- List of top 10 situations

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Application Server Summary and Business Process Manager Summary workspaces

The Application Server Summary workspace provides summary monitoring information for a WebSphere Application Server. The Business Process Manager Summary workspace provides summary monitoring information for a Business Process Manager Server. These workspaces are identical and contain two views: the Application Server - Resources view and the Applications Server - Applications view.

Application server - Resources View

The Application server - Resources view contains the following icons:

- OS
- JVM
- Datasource
- Threadpool
- Services

If ITCAM for SOA is installed on the monitored Business Process Manager server, right-click any resource and select **Operation Flow for Application Server** to view the Operation Flow for Application Server workspace, provided by ITCAM for SOA. In this workspace, you can see the topology for all components running on the server.

OS icon

The OS icon provides summary metrics for machine CPU and paging metrics. The flyover for the OS icon displays the following metrics:

- System CPU (ms)
- System Paging Rate (Kbytes/sec)
- Number of problem situations
- List of top 10 situations

When you double-click the OS icon, the following subsidiary views display in the OS Stack workspace:

- Current OS stack summary
- CPU used
- System Paging

For further information about the OS Stack workspace, see OS Stack

JVM icon

The JVM icon flyover provides summary metrics for: CPU for the JVM process, garbage collection, and heap metrics. The flyover information for the JVM icon displays the following metrics:

- JVM CPU%
- GC Active Time (ms)
- List of top 10 situations

When you double-click the JVM icon, the following subsidiary views display in the JVM Stack Trend workspace:

- JVM CPU Trend
- Percent GC time used
- Heap Usage trend

For further information about the JVM Stack Trend workspace, see JVM Stack Trend

Datasources icon

The Datasources icon flyover provides summary metrics for JDBC, JMS, JCA, and JTA, it also indicates the number of problem situations. When you double-click the Datasource icon, the following subsidiary views display in the Datasources workspace:

- Worst Datasource Query Times
- Worst Datasource Update Times
- Datasources - Current Interval

Threadpool icon

The Threadpool icon flyover provides summary metrics for threadpool information including the number of problem situations. When you double-click the Threadpool icon, the following subsidiary views are displayed in the Threadpools workspace:

- Highest Average Pool Sizes
- Average thread pool usage
- Threadpools table

Services icon

The Services icon flyover provides summary metrics for web services, Workload Management, and System Integration Bus. When you double-click the Services icon:

- for Portal, Services icon takes you to web Services which has the following views:
  - Worst Response Times
  - Most Popular
  - Web Services
  - Web Service Gateway
- for Lotus, the Services icon takes you to Workload Management which has these views:
  - WLM Server Incoming Requests

– WLM Client Outgoing Requests
– Workload Management Server
– Workload Management Client

Application server - Applications View

In this view, there is an icon per application. The flyover for an Application icon displays the following metrics:

- Average Response Time (ms)
- Request Rate (Req/Sec)
- Error Rate (Errors/sec)
- Monitoring Level
- Number of problem Situations
- List of top 10 situations

If ITCAM for SOA version 7.2 is installed on the monitored Business Process Manager server, right-click any application and select **Selected Application - Group Summary** to view the Group Summary workspace, provided by ITCAM for SOA. In this workspace, you can see the status of all process groups that include any components or operations that are a part of the selected application.

When you double click an Application icon, the following subsidiary views are displayed in either the Application Trend at L1 or Application Trend at L2/L3 workspace:

- Response Time Trend
- Error Rate Trend
- Request Rate Trend
- Selected Application Summary: Application Name

For further information about the Application Trend workspace, see "Selected Application - Application Trend at L1 workspace" on page 72, and "Selected Application - Application Trend at L2/L3 workspace" on page 73

Application Server Summary and Business Process Manager Summary workspaces

To access the workspaces, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, click a **WebSphere Application Server** or **Business Process Manager** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Resources and Applications workspaces

The Resources and Applications workspaces provide monitoring data for your application server.

Resources Workspace

To access the Resources workspace, right-click the application server node in the Tivoli Enterprise Portal navigator and select **Workspace** and then select **Resources**. The Resources workspace contains the following views:

- Application Servers Resources
- Situation Event Console

For information about the Application Servers Resources view, see "Application Server Summary and Business Process Manager Summary workspaces" on page 50. The Situation Event Console displays additional detail for all open situations. For details on how to perform filtering on open situations, see Tivoli Monitoring help.

If ITCAM for SOA is installed on the monitored Business Process Manager server, right-click any resource and select **Operation Flow for Application Server** to view the Operation Flow for Application Server workspace, provided by ITCAM for SOA. In this workspace, you can see the topology for all components running on the server.

Applications Workspaces

To access the Applications workspace, right-click the application server node in the Tivoli Enterprise Portal navigator and select **Workspace** and then select **Applications**. The Applications workspace contains the following views:

- Application Servers Applications
- Situation Event Console

For information about the Application Servers Applications view, see "Application Server Summary and Business Process Manager Summary workspaces" on page 50. The Situation Event Console displays additional detail for all open situations. For details on how to perform filtering on open situations, see Tivoli Monitoring help.

If ITCAM for SOA is installed on the monitored Business Process Manager server, right-click any application and select **Selected Application - Group Summary** to view the Group Summary workspace, provided by ITCAM for SOA. In this workspace, you can see the status of all process groups that include any components or operations that are a part of the selected application.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Situation Mapping and Summary Workspaces

User-defined situations are mapped to icons in summary workspaces. When you create a situation, if the situation then triggers an alert, detail of the situation is displayed in one of the summary workspaces icon flyovers.

When you create a situation, the attribute group you base the situation on determines which summary workspace icon flyover the situation displays in. The following table shows which attribute groups map to which icons and predefined situations :

Table 4. Mapping of attribute groups to predefined situations

Tivoli Enterprise Monitoring Agent Attribute Group Name	**Icons**	**Predefined Situations**
Applications Monitoring Configuration	N/A	WASAppDiscovered
Requests Monitoring Configuration	N/A	
Baseline	N/A	
Applications Health Status	Applications	WASApplicationBad, WASApplicationFair, WASApplicationGood
Applications Server Status	JVM	
Log Analysis	JVM	WASError
KYN Command	N/A	
WebSphere Agent Events	N/A	
DC Messages WebSphere	JVM	
Dynamic Cache	Services	
Dynamic Cache Templates	Services	
Workload Management Client	Services	
Workload Management Server	Services	
DB Connection Pools	Datasources	WASDBConnectionPoolThrdTimeout WASDBConnectionPoolUsageMaxed WASDBConPAverageUsageTimeHigh WASDBConPAvgWaitTimeHigh
Container Object Pools	Threadpools	
Enterprise Java beans	Applications	WASEJBCreateTimeHigh WASEJBMethodResponseTimeHigh WASEJBRemoveTimeHigh
Web Applications	Applications	WASWebApplicationError
Web Applications - Sessions	Applications	WASSrvlSessAvgActiveSessionHigh WASSrvlSessExtReadTimeHigh WASSrvlSessExtWriteTimeHigh
Applications Server	JVM, OS	WASHighCPUPercentUsed
EJB Containers	Applications	
Servlets JSPs	Applications	WASServletsJSPError
Servlet Sessions	Applications	
Thread Pools	Threadpools	WASThreadPoolPercentMaxed WASThreadFreeLow

Table 4. Mapping of attribute groups to predefined situations (continued)

Tivoli Enterprise Monitoring Agent Attribute Group Name	Icons	Predefined Situations
Container Transactions	Datasources	WASContainerTransactionRollback WASCTGlbTransDurationHigh WASCTLclTransDurationHigh
J2C Connection Pools	Datasources	WASJ2CConnectionPoolUsageMaxed WASJ2CCPAverageUsageTimeHigh WASJ2CCPAvgWaitTimeHigh
DCS Stack		
High Availability Manager		
Web Services Gateway		
Web Services		
Alarm Manager		
Scheduler	Services	
Client Communications	Services	
Durable Subscriptions	Services	
Messaging Engine Communications	Services	
Messaging Engines	Services	
Queue	Services	
Service Component Elements	Services	
Service Components	Services	
Topic Spaces	Services	
WMQ Client Link Communications	Services	
WMQ Link Communications	Services	
Workplace Mail Service	Datasources	
Workplace Mail Queues	Datasources	
Workplace Mail IMAP/POP	Services	
Portal Summary	Services	
Portal Page Summary	Services	WASPortalPageResponseTime
Portlet Summary	Services	WASPortletResponseTime
Datasources	Services	WASDataSrcConWaitTimeHigh
Request Times and Rates	Applications	WASHighResponseTime
Request Analysis	Applications	WASReqSQLExecuteTimePercentHigh WASReqSQLQueryTimePercentHigh WASReqSQLUpdateTimePercentHigh
JMS Summary	Datasources	
Selected Request	Applications	

Table 4. Mapping of attribute groups to predefined situations (continued)

Tivoli Enterprise Monitoring Agent Attribute Group Name	Icons	Predefined Situations
Garbage Collection Analysis	JVM	WASHighGCTimePercent WASAvgHeapSizeAfterGCHigh
Allocation Failure	JVM	WASOutofHeapSpace
Garbage Collection Cycle	JVM	
WebSphere Agent		WASNotConnected
WebSphere App Server		WASHighCPUPercentUsed WASHighResponseTime

Where NA is indicated for the icon, it means that situations created based on these attribute groups are not reported in the summary workspaces. This is because these tables are strictly related to Tivoli Enterprise Monitoring Agent configuration parameters that do not reflect the application or application server health.

For more information, see:

WebSphere Agent situations
WebSphere Agent attributes

Summary Workspaces error messages

Four possible error messages can be displayed in the summary workspace status bar.

The following table lists and explains the error messages:

Table 5. Summary Workspaces error messages

Error Message	Explanation
Internal Communication Error	This message indicates a communication problem between the summary workspaces front end and the summary workspaces back-end code (called evaluator) running inside the embedded WebSphere server on the Tivoli Enterprise Portal Server server. This error displays for two reasons: 1. If this message is displayed for all the summary workspaces, there is an installation error. Summary workspaces require code to run inside Tivoli Monitoring eWAS. Ensure that Tivoli Monitoring 6.2, including eWAS, is installed. Install ITCAM Agent for WebSphere Applications support files. After installation, reconfigure the Tivoli Enterprise Portal Server. If you do not reconfigure the Tivoli Enterprise Portal Server, the Summary Workspace status bar displays "Internal Communication Error". 2. If this error message is displayed for only some of the summary workspaces, turn up tracing and send to IBM support for review.
Invalid Data	This message indicates that data being sent from the summary workspaces back-end code (called evaluator) running inside the embedded WebSphere server on the Tivoli Enterprise Portal Server server is malformed. Turn on the tracing, collect the logs, and send to IBM support for further analysis.

Table 5. Summary Workspaces error messages (continued)

Error Message	Explanation
No Applications Configured	This message indicates that no applications are configured on the WebSphere server. This message also displays if the WebSphere server is not connected to the Tivoli Enterprise Monitoring Agent. The message no longer displays when the WebSphere server is back online. No user action is needed.
No Applications Servers Connected	This message indicates that no WebSphere servers are connected to the Tivoli Enterprise Monitoring Agent. The message is no longer displayed when the WebSphere server is back online. No user action is needed.

Configuration workspaces

Monitoring Agent configuration and tuning is facilitated in the Tivoli Enterprise Portal through *configuration workspaces*. There are two configuration workspaces: one for the Monitoring Agent level and one for the server level:

- WebSphere Agent Configuration workspace
- application server Configuration workspace

Both configuration workspaces have the same tabs and configuration settings.

The WebSphere Agent Configuration workspace settings are initial settings applied to all data collectors managed by the Monitoring Agent. For example, when a data collector connects to the Monitoring Agent for the first time or if the data collector configuration was deleted. In both these examples, the configuration settings specified in the WebSphere Agent Configuration workspace are applied.

The application server Configuration workspace contains individual server settings and the settings in this workspace override the settings in the WebSphere Agent Configuration workspace.

Settings for the WebSphere Agent Configuration and application server Configuration workspaces are saved in the following files:

Table 6. Workspace configuration files

Workspace	Configuration file
WebSphere Agent Configuration workspace in windows:	*CANDLE_HOME*\TMAITM6*hostname_productcode*.xml
application server Configuration workspace in windows:	*CANDLE_HOME*\TMAITM6\ *hostname_productcode_servervendor.servernode.server name*.xml
WebSphere Agent Configuration workspace in other platforms:	*CANDLE_HOME*/config/*hostname_productcode*.xml

Table 6. Workspace configuration files (continued)

Workspace	Configuration file
application server Configuration workspace in other platforms:	*CANDLE_HOME*/config/ *hostname_productcode_servervendor.servernode.server name*.xml

The WebSphere Agent Configuration workspace configuration settings are initial settings which are applied to all data collectors managed by the selected WebSphere agent. The application server Configuration workspace configuration settings override agent level configuration settings.

Both configuration workspaces have the following two views:

- **Application Diagnostics Configuration view** - this view has the following four tabs
  - Collection (Basic)
  - Collection (Advanced)
  - Application Dashboard (Basic)
  - Application Dashboard (Auto Threshold)
- **Application Servers view** - this view has one tab which lists all application servers monitored by the selected WebSphere agent, for each application server, there is a link to application server Configuration workspace.

Application Diagnostics Configuration - Basic Tab

The Basic tab contains the following fields:

- **Request Data Monitoring** - in this field, specify the monitoring level for requesting data from connected data collectors. The following values can be entered into this field:
  - **Disable** - request data is not monitored and is not displayed
  - **Level 1** - only monitors edge request data, for example, servlets, JSPs, EJBs, SCA requests, and web service requests
  - **Level 2** - monitors nested request data in addition to edge request data, for example, JNDI, JMS, JDBC, and JCA requests

  Important: This monitoring level is applied by default to newly discovered applications. However, you can set the monitoring level for any operation separately, using the "Set_Application_Monitoring: Set monitoring" on page 294 Take Action command.
- **Request Data Monitoring Method** - in this field, specify the monitoring method used by the Monitoring Agent to govern when it uploads request and garbage collection data from connected data collectors. The following values can be entered into this field:
  - **On Demand** - when the monitoring method is set to On Demand, data is uploaded only when requested by the user. The exception to this is if the cache of data is still current. Whether this data is current is determined by the Request Data On Demand Maximum Sample Age (sec) field in the Collection Advanced tab. With On Demand monitoring, the Tivoli Enterprise Portal response time is slower because the data is collected as requested. However, the retrieved data is the most current available. CPU and memory usage on the monitored systems is lower for On Demand monitoring.

  - **Fixed Interval** - when the monitoring method is set to Fixed Interval, the Monitoring Agent will upload sample data from the data collectors at regular fixed intervals, and respond to a user request using the latest cache of sample data gathered at the last interval. With Fixed Interval monitoring, CPU and memory usage can be higher because more data is collected more frequently but Tivoli Enterprise Portal response time is faster as the data is more readily available. Data samples are calculated for the same time interval and as a result are more consistent.
- **Resource Data Monitoring** - in this field, specify whether resource data is monitored from connected data collectors. The following values can be entered in this field:
  - **Disable** - resource data is not collected by the Monitoring Agent and is not displayed in the Tivoli Enterprise Portal.
  - **Enable** - resource data is collected by the Monitoring Agent and is displayed in the Tivoli Enterprise Portal.
- **Resource Data Monitoring Method** - in this field, specify the monitoring methodology used by the agent to govern when it uploads resource data from connected data collectors. The following values can be entered into this field
  - **On Demand** - when the monitoring method is set to On Demand, data is uploaded only when requested by the user. The exception to this is if the cache of data is still current. Whether this data is current is determined by the Resource Data On Demand Maximum Sample Age (sec) field in the Collection Advanced tab. With On Demand monitoring, the Tivoli Enterprise Portal response time is slower as the data is collected as requested. However, the retrieved data is the most current available. CPU and memory usage on the monitored systems is lower for On Demand monitoring.
  - **Fixed Interval** - when the monitoring method is set to Fixed Interval, the Monitoring Agent will upload sample data from the data collectors at regular fixed intervals, and respond to a user request using the latest cache of sample data gathered at the last interval. With Fixed Interval monitoring, CPU and memory usage can be higher because more data is collected more frequently but Tivoli Enterprise Portal response time is faster as the data is more readily available. Data samples are calculated for the same time interval and as a result are more consistent.
- **Garbage Collection Monitoring** - in this field, specify if verbose garbage collection output monitoring is enabled. The following values can be entered in this field:
  - **Disable** - verbose garbage collection output data is not collected by the Monitoring Agent and is not displayed in the Tivoli Enterprise Portal.
  - **Enable** - verbose garbage collection output data is collected by the Monitoring Agent and is displayed in the Tivoli Enterprise Portal.

Application Dashboard (Basic) tab

The Application Dashboard (Basic) tab contains the following fields:

- **Application Fair Completion Rate Threshold (%)** - Defines the default completion percentage for application fair availability threshold.
- **Application Bad Completion Rate Threshold (%)** - Defines the default completion percentage for application bad availability threshold.
- **Application Fair Resource Usage Threshold (%)** - Defines the threshold percentage for fair usage level of an application resource.
- **Application Bad Resource Usage Threshold (%)** - Defines the threshold percentage for bad usage level of an application resource.

- **Application Resource Usage Monitoring Cutoff Threshold (%)** - Defines the cutoff threshold percentage for application resources usage monitoring.
- **Request Monitoring Control Level** - Specifies the request monitoring control level for the server. The following entries can be entered to this field:
  - **Application** Request monitoring settings are defined for each application independently.
  - **Server** Request monitoring settings are defined on the server level

The Request Monitoring Control Level option gives you more control over request monitoring settings. In certain sequences, you can benefit from locking the request monitoring control on the server level, because you can change data collector monitoring level in one place.

In ITCAM For Application Diagnostics, the request data monitoring level (Level1 or Level2) that displays on the Tivoli Enterprise Portal depends on the **Request Monitoring Control Level** setting you choose.

- If you select the **Request Monitoring Control Level** as **Application** (the default setting), the monitoring level is set separately for every application. For a newly discovered application, the current monitoring level for the agent is applied. Therefore, to display Level2 data for an application in the Tivoli Enterprise Portal, you must set the monitoring level for the application using the "Set_Application_Monitoring: Set monitoring" on page 294 Take Action command.
- If you select the **Request Monitoring Control Level** as **Server**, the level is set for the server and affects all applications. If you set the Request Data Monitoring Level at Level2 using the "Start_Request_Monitoring : Begin reporting request data" on page 296 Take Action command, the Request Data Monitoring Level for all the applications in this server is Level2. While you can still use the **Set_Application_Monitoring** Take Action command to set the monitoring level for an individual application, the level does not apply as a server-wide level is in operation. To apply the levels set for individual applications, change the **Request Monitoring Control Level** setting to **Application**.

Collection Advanced tab

The Collection Advanced tab contains the following fields:

- **Request Data On Demand Maximum Sample Age (sec)** - The maximum allowed age of sample request data in seconds before collecting a new sample of data. If the monitoring method is set to On Demand, when a user request is received, and the current sample cache is older than the value specified, then the Monitoring Agent uploads a new sample before servicing the request. Two successive on-demand requests received from users within the period specified by the maximum sample age return the same results without incurring the CPU and memory cost of a new data sample.
- **Request Data Fixed Interval between Collections (sec)** - The amount of time in seconds between uploads of sample request data from the data collectors to the Monitoring Agent when the monitoring method is set to Fixed Interval. When a user request is received, it is serviced from the latest uploaded sample.
- **Request Data Sampling Rate (%)** - The percentage of requests that are sampled for request data monitoring.
- **Resource Data On Demand Maximum Sample Age (sec)** - The maximum allowed age of sample resource data in seconds before collecting a new sample of data. If the monitoring method is set to On Demand, when a user request is received and the current sample cache is older than the value specified in this field, then the Monitoring Agent uploads a new sample before servicing the

request. Two successive on-demand requests received from a user within the period specified by the maximum sample age return the same results without incurring the CPU and memory cost of a new data sample.

- **Resource Data Fixed Interval between Collections (sec)** - The amount of time in seconds between uploads of sample resource data from the data collectors to the agent. When a Tivoli Enterprise Portal request is received, it is serviced from the latest uploaded sample.
- **Garbage Collection Polling Interval (sec)** - The interval in seconds between the Monitoring Agent scanning the verbose Garbage Collection output.
- **Log Scan Polling Interval (sec)** - The interval in seconds between the Agent scanning the application server standard output log for changes.

Application Dashboard (Auto Threshold) tab

The Application Dashboard (Auto Threshold) tab contains the fields:

- **Response Time Selection (%)** - Defines the percentage from baseline to be used for response time auto-thresholding.
- **Response Time Deviation (%)** - Defines the deviation for baseline selection to be used for response times auto-thresholding.
- **Fair Response Time Projection (%)** - Defines the percentage to derive the fair response time threshold from the baseline selection.
- **Bad Response Time Projection (%)** - Defines the percentage to derive the bad response time threshold from the baseline selection.

Workspace link to managing server visualization engine

With the appropriate configuration and permissions, you can access the managing server visualization engine from specific workspaces in the WebSphere Tivoli Enterprise Portal. Instead of opening another browser and clicking the relevant link, you can access the managing server visualization engine from Tivoli Enterprise Portal using a link called **Diagnostic Server Activity Display**. Some of the workspaces have additional links you can use to access the managing server visualization engine. All these links begin with the word **Diagnostic**. When you log in to the **Welcome to the Application Monitor** page, the information displayed is specific to the content in the Tivoli Enterprise Portal workspace you selected. You also can manually create your own links to the managing server visualization engine using the **Link Wizard**, which is available on all workspaces.

Important: To use this functionality, you need ITCAM for Application Diagnostics Managing Server.

You can access the managing server visualization engine from the following workspaces.

- WebSphere Agent
- Request Analysis
- Garbage Collection Analysis
- Datasources
- JMS Summary
- Web Applications
- EJB Containers
- DB Connection Pools
- J2C Connection Pools
- Thread Pools

Here is a list of the managing server visualization engine links available from the workspaces:

- **Diagnostic Server Activity display**. Use this link to diagnose application problems, for example, slow transactions or high response times. This link is available from all workspaces except Request Analysis and Garbage Collection Analysis.
- **Diagnostic In-Flight Request Search.** Use this link to identify any hanging transactions. This feature is only available from the WebSphere Agent and Request Analysis workspaces.
- **Diagnostic Recent Completed Requests**. The Recent Requests tab displays data regarding recently completed server requests. This feature is only available from the Request Analysis workspace.
- **Diagnostic SMF Data**. This feature is only available you are using a z/OS data collector and in the Request Analysis workspace. The SMF Overview displays summary information for all the resources on the selected application server.
- **Diagnostic JVM Thread Display** Use this link to diagnose application problems, for example, slow transactions by examining threads running in JVM. This link is available from the Thread Pools workspace.
- **Diagnostic Memory Leak** Use this link to diagnose memory leak problems. This link is available from the Garbage Collection Analysis workspace.

For information about accessing workspaces, see "Accessing the managing server visualization engine from Tivoli Enterprise Portal workspaces" on page 64.

Prerequisites for access

The following conditions must be met to gain access to the managing server visualization engine through the Tivoli Enterprise Portal.

- ITCAM for Application Diagnostics managing server and ITCAM Data Collector for WebSphere must be installed in your environment.
- Tivoli Enterprise Portal users must be members of the **Diagnostic Users Group** within the Tivoli Enterprise Portal. For more information, see "Granting users access to managing server visualization engine from Tivoli Enterprise Portal" on page 63.
- During the installation of the managing server, kernel properties in the managing server must be set up accordingly with the correct host name and port number. This action is completed by the user installing the managing server.

You can also create your own links to the managing server visualization engine using the **Link Wizard**.

For more information, see "Creating links to the managing server visualization engine using the Link Wizard" on page 68

Kernel Settings to access the managing server visualization engine through the Tivoli Enterprise Portal

If users access the managing server visualization engine through the Tivoli Enterprise Portal, the kernel properties in the managing server must be set up accordingly with the correct host name and port number.

The following properties must be added to `kl1.properties` and `kl2.properties` (By default, the managing server installer replaces *@{HOST_VE}* and *@{PORT_VE_HTTP}* at managing server installation time) :

- *ve.host=@{HOST_VE}*
- *ve.port=@{PORT_VE_HTTP}*

At kernel startup time, the kernel must read these two properties and set them as part of properties in *PROBE_CONFIG.PROPS*. If a user changes the VE host name or port number, then the kernel needs to be restarted. Use the following steps to start and stop the kernel In `$MS_HOME/bin`:

1. To start kernel, issue:`./amctl.sh wd<kernel count> start`
2. To stop kernel, issue: `./amctl.sh wd<kernel count> stop`

where <*kernel count*> is 1 by default.

Granting users access to managing server visualization engine from Tivoli Enterprise Portal

As a user, you must be set up as a member of the **DIAGNOSTIC USERS** group in the Tivoli Enterprise Portal, otherwise you cannot access the visualization engine from the Tivoli Enterprise Portal. The default administration user **Sysadmin** is automatically a member of this group. Any user with administrator permissions can add or remove additional users to the **DIAGNOSTIC USERS** group.

Before you begin

To complete this task you must be a user with administrator permissions to add or remove additional users to the **DIAGNOSTIC USERS** group. For more information about access, see "Prerequisites for access" on page 62.

Procedure

1. From the Tivoli Enterprise Portal main menu, click **Edit > Administer Users**.
2. In the **Administer Users** window, click the **Users Groups** tab.
3. Click the group name, in this case **DIAGNOSTIC USERS**.
4. Click the **Members** tab to view existing members of this group and to assign additional users.
5. To add users, in the **Available Members** section, select the users that you want to assign to the Group.
6. Click the left arrow to move the selected users to the **Assigned Members** section of the window.
7. Click **Apply** and **OK** to implement the changes.
8. To remove a user from the group, click the **Assigned Members** tab, and select the users that you want to remove.
9. Click the right arrow to move the selected users to the **Available Members tab**. Then click **Apply** and **OK**.

What to do next

Users who are members of this group can access the managing server visualization engine from the Tivoli Enterprise Portal. See "Accessing the managing server visualization engine from Tivoli Enterprise Portal workspaces" on page 64.

Adding the LDAP user to Tivoli Enterprise Portal user accounts:

About this task

To add the LDAP user to Tivoli Enterprise Portal user accounts, use Tivoli Enterprise Portal user administration.

1. In the Tivoli Enterprise Portal main menu, select **Administer Users**.
2. Click **Create New User** to create a user profile from defaults, or **Create Another User** to create a user profile as a copy of an existing one.
3. In the **Modify User** window, enter the user name for the new user in the **User ID** field.
4. In the **Distinguished Name** field, enter the following string:

   `uid=`*`username`*`,cn=users,dc=ibm,dc=com`

   This string registers the LDAP user with Tivoli Enterprise Portal. If you are using an existing LDAP configuration, use the applicable distinguished name.

Tip: For more information about Single sign-on, see **Appendix N Setting Up single sign on for Tivoli Enterprise Portal Users** in the *ITCAM for Application Diagnostics managing server Installation and Customization Guide.*

Accessing the managing server visualization engine from Tivoli Enterprise Portal workspaces

Use the following links for information about how to access the managing server visualization engine from the Tivoli Enterprise Portal workspaces.

To ensure that you have access to the managing server visualization agent, see "Prerequisites for access" on page 62 before you begin.

- "Accessing the managing server visualization engine from the WebSphere Agent workspace" on page 129
- "Accessing the managing server visualization engine from the Request Analysis workspace" on page 108
- "Accessing the managing server visualization engine from the Garbage Collection Analysis workspace" on page 91
- "Accessing the managing server visualization engine from the Datasources workspace" on page 81
- "Accessing the managing server visualization engine from the JMS Summary workspace" on page 96
- "Accessing the managing server visualization engine from the Web Applications workspace" on page 126
- "Accessing the managing server visualization engine from the EJB Containers workspace " on page 88
- "Accessing the managing server visualization engine from the DB Connection Pools workspace" on page 84
- "Accessing the managing server visualization engine from the J2C Connection Pools workspace" on page 95
- "Accessing the managing server visualization engine from the Thread Pools workspace" on page 124

For additional information, see:

- "Workspace link to managing server visualization engine" on page 61

- "Access the managing server visualization engine from the Tivoli Enterprise Portal"

Access the managing server visualization engine from the Tivoli Enterprise Portal

You can access the managing server visualization engine from links in the ITCAM Agent for WebSphere Applications workspaces.

When you access the managing server visualization engine in this way, the managing server visualization engine displays in a browser view in a workspace. The Tivoli Enterprise Portal navigation tree is automatically hidden in the workspace. To show or hide the Tivoli Enterprise Portal navigation tree, click the small black arrow.

The following table displays a list of Tivoli Enterprise Portal workspaces that have links to the managing server visualization engine.

Table 7. Tivoli Enterprise Portal workspaces that have links to managing server visualization agent

Workspace: Table View Name	**Number of links to managing server visualization agent**	**Link Name**	**Link Target Pages managing server visualization agent**	**Pre-populated information in the link page to managing server visualization engine**
WebSphere Agent Summary Status > Application Servers WebSphere Agent Summary Status > Application Servers WebSphere Agent Configuration > Application Servers	2	• Diagnostic Server Activity Display • Diagnostic In-Flight Request Search	• Server Activity Display – Active Requests • In-Flight Request Search	The Group Server drop-down menu is pre-populated based on data collector information from Tivoli Enterprise workspace.
OS Stack >Current OS Stack Summary	3	• Diagnostic Server Activity Display • Diagnostic In-Flight Request Search • <platform OS> <platform> is one of the following operating systems: Linux, UNIX, Windows or z/OS	• Server Activity Display – Active Requests • In-Flight Request Search • Using the dynamic workspace link to the corresponding OS agent workspace. For z/OS, the link is to OMEGAMON XE for z/OS.	The Group Server drop-down menu is pre-populated based on data collector information from Tivoli Enterprise workspace.

Table 7. Tivoli Enterprise Portal workspaces that have links to managing server visualization agent (continued)

Workspace: Table View Name	Number of links to managing server visualization agent	Link Name	Link Target Pages managing server visualization agent	Pre-populated information in the link page to managing server visualization engine
JVM Stack Trend >JVM Stack Trend	1	Diagnostic Memory Leak	Memory Leak Analysis	The Group Server drop-down menu is pre-populated based on data collector information from Tivoli Enterprise workspace.
Request Analysis > Requests – Current Interval	3	• Diagnostic Recent Completed Requests • Diagnostic In-Flight Request Search • Diagnostic SMF Data (z/OS only)	• Server Activity Display – Recent Requests • In-Flight Requests • SMF Data (for z/OS data collectors only)	• The Group Server drop-down menu is pre-populated based on data collector information from Tivoli Enterprise workspace. • Content in Request Detail column of Requests table view in Tivoli Enterprise Portal is pre-populated in the following fields: – Recent Requests: Client Request – In-Flight Request Search: Search Request/ Transaction field
Garbage Collection Analysis >Garbage Collection Analysis	1	Diagnostic Memory Leak	Memory Leak Analysis	The Group Server drop-down menu is pre-populated based on data collector information from Tivoli Enterprise workspace.

Table 7. Tivoli Enterprise Portal workspaces that have links to managing server visualization agent (continued)

Workspace: Table View Name	Number of links to managing server visualization agent	Link Name	Link Target Pages managing server visualization agent	Pre-populated information in the link page to managing server visualization engine
Thread Pools >Thread Pools	1	Diagnostic JVM Thread Display	JVM Thread Display	The Group Server drop-down menu is pre-populated based on data collector information from Tivoli Enterprise workspace.
Datasources > Datasources – Current Interval Web Applications >Web Applications EJB Containers >EJB Containers JMS Summary >JMS Summary – Current Interval DB Connection Pools > DB Connection Pools J2C Connection Pools > J2C Connection Pools	1	Diagnostic Server Activity Display	Server Activity Display – Active Requests	The Group Server drop-down menu is pre-populated based on data collector information from Tivoli Enterprise workspace.

The **Server Group** feature that displays applies to the managing server visualization engine. When you access any of these pages from the Tivoli Enterprise Portal, the information in the **Groups** and **Servers** fields is automatically populated based on the data collector associated with the link and workspace you selected in the Tivoli Enterprise Portal.

Groups are a set of application servers which have similar functionality. All configured data collectors are automatically in the **Unassigned Servers Group**. The relationship between Server Group and data collector is many to many. A data collector can belong to one or more server groups. A server group can have one or more data collectors. You can add data collectors to groups using the **Server Management** functionality in the managing server visualization engine. For more information about adding data collectors to Server Groups, refer to the Composite Application Manager Help in the managing server visualization engine interface.

The **Server Activity Display** section has three tabs.

- **Active Requests**: provides real-time request or transaction data for an application server at the time the page displays.

- **Recent Requests**: displays the last 100 or less completed request or transaction data for an application server.
- **Lock Contentions**: displays requests that are hanging because they are waiting on a lock. The data shows data that is currently locked and the item that is waiting to be locked.

The **Active Requests** tab and the **Recent Requests** tab have a toolbox icon  . You can click this icon to access direct links to the following features:

- JVM Display
- System Resources
- Monitoring On Demand®
- data collector Properties
- Trap and Alert Management

When you access the managing server visualization engine in this way, the managing server visualization engine displays in a browser view in a workspace. The Tivoli Enterprise Portal navigation tree is automatically hidden in the workspace. To show or hide the Tivoli Enterprise Portal navigation tree, click the small black arrow.

Creating links to the managing server visualization engine using the Link Wizard

Throughout the Tivoli Enterprise Portal, you can use the **Link Wizard** to manually create links to the managing server visualization engine.

Creating links

You can access the Link Wizard feature from other views and workspaces in the Tivoli Enterprise Portal.

1. To access the **Link Wizard**, from any of the tables or views, right-click the link icon and click **Link Wizard**.
2. Follow the steps in the wizard to do one of the following actions:
   - Create a link.
   - Modify an existing link.
   - Delete one or more links.
3. Type the name and description of the link.
4. Choose one to the following options with the aid of the descriptions in the **Link Wizard**.
   - Dynamic
   - Absolute
   - Relative
5. Choose the option that you want to use. Follow the instructions in the help within the application until you get to the **Workspace Link Wizard Parameters** page.

Adding parameters to the Link Wizard

When you get to the **Workspace Link Wizard Parameters** page in the Link Wizard you must manually add these two symbols **VEHOSTPORT** and **VEPATH** and add information to these parameters. There are two predefined workspaces which have an embedded browser as its only view.

- Diagnostic Link for Agent. Choose this workspace if the link is from the agent level workspaces.
- Diagnostic Link. Choose this workspace if the link is from the server level workspace.

To add Symbols to the Link Wizard, complete the following steps:

1. Click **Symbol** and type **VEHOSTPORT**.
2. Click **OK** to add the Symbol.
3. To add an expression, select **VEHOSTPORT**, and click **Modify Expression**.
4. **Basic Setup:** In the text field, type the expression that you want to add. The value for the **VEHOSTPORT** is **<your ve host>:<your ve port>.** For example, if in your environment, the managing server visualization engine is installed on host1, with port 9080, then the **VEHOSTPORT** value is: *"host1:9080"*.

   Important:
   - Double quotation marks are required in the expression.
   - If your managing server visualization engine host or port information changes, then you must update the link you defined and correct the **VEHOSTPORT** information manually.

   Advanced Setup: In the text field, type the expression that you want to add. The value for the **VEHOSTPORT** value is *CALL(candle.kwj.ve.ITCAMLinkHelper, getVehostportForWASServer, null, null, $kfw.TableRow:ATTRIBUTE.<table_name>.ORIGINNODE$)*. To get the expression: *$kfw.TableRow:ATTRIBUTE.<table_name>.ORIGINNODE$,* in the Expression Editor, click **Symbol**.
5. Click **Origin Node** and click **OK** to get *$kfw.TableRow:ATTRIBUTE.<table_name>.ORIGINNODE$.*

   When using the Advanced set up option, if your managing server visualization agent host or port information changes, ITCAM for Application Diagnostics custom code updates the changes automatically, you do not have to modify the links you defined manually to correct the information.
6. To add an expression, **Basic Setup:** the **VEPATH** value can be set as *"am/ve/sad/threadList?mappingTEPUrl=true"*

   Important:
   - Double quotation marks are required in the expression.
   - When you use the Basic Setup option, you must select the server group and the server in the managing server visualization engine yourself when you log in to managing server visualization engine.

   To add an expression, **Advanced Setup:** Set the **VEPATH** value in the Expression Editor as:*"am/ve/sad/threadList?mappingTEPUrl=true&server=" + CALL(candle.kwj.ve.ITCAMLinkHelper, getServerIdForWASServer, null, null, $kfw.TableRow:ATTRIBUTE.<table_name>.ORIGINNODE$)*

   Where the correct expression of *$kfw.TableRow:ATTRIBUTE.<table_name>.ORIGINNODE$* can be found by using Symbols view under Expression Editor: *$kfw.TableRow:ATTRIBUTE.<table_name>.ORIGINNODE$ (Symbol: Origin Node)*.
7. Review the details in the **Workspace Link Wizard - Summary**. Click **Finish**.
8. If you use the **Advanced Setup** options in Step 4 and Step 6, modify the **linkIsEnabled** parameter in the Workspace Link Wizard Parameters view with expression: *CALL(candle.kwj.ve.ITCAMLinkHelper, isEnabledForWASServer, null,*

null, $kfw.TableRow:ATTRIBUTE.<table_name>.ORIGINNODE$) && $kfw.TableRow:ATTRIBUTE.<table_name>.ASID$!= -3. In the **Expression Editor**, use the Symbols view to find expressions of *$kfw.TableRow:ATTRIBUTE.<table_name>.ORIGINNODE$ (Symbol: Origin Node)*and *$kfw.TableRow:ATTRIBUTE.<table_name>.ASID$ (Symbol: ASID)*.

Manually adding your own links to the Link Wizard

The minimum settings are **VEHOSTPORT** and **VEPATH**. If you need to link to a different page, you must change this value to corresponding URL path. Here is a list of frequently used managing server visualization engine pages and URL paths:

- Enterprise Overview: `am/home`
- Server Overview: `am/ve/serverOverview`
- Server Statistics Overview : `am/avm/main`
- Server Activity Display: `am/ve/sad/threadList`
- Memory Leak: `am/ve/memory/leakReport`
- JVM Thread Display: `am/ve/jtd/threadGroupList`
- Monitoring On Demand: `am/ve/mod/console`
- Trap and Alert Management: `am/trap`
- System Resources:`am/ve/jmxbrowser`

Important: If you change the host port number at any point, you must modify these two properties again and the kernel properties on the Managing Server installation must be restarted to identify the changes.

Link anchor

You can use the **Link anchor** option to access the **Link anchor properties** window. You can use the **Link anchor properties** window to display visual indicators on tables where customized links have been defined, and to establish a default link that opens when the user clicks the indicator.

1. From any of the tables, right-click the choose link icon  and click **Link Anchor** to display the **Link anchor properties** window.
2. Depending on the area of the table item you select, the window displays the following information:
   - Default no link
   - Show Link indicator
   - Link indicator always enabled.
3. For more information about the uses of these items, refer to the help within the **Link anchor properties** window.

"Workspace link to managing server visualization engine" on page 61

Workspace link to ITCAM for SOA

You can navigate from ITCAM Agent for WebSphere Applicatins workspaces to ITCAM for SOA.

If ITCAM for SOA is installed and configured for the same application server, you can navigate from the "Application Server Summary and Business Process Manager Summary workspaces" on page 50 and from the "Application Health

workspace" on page 73 to workspaces provided by ITCAM for SOA. ITCAM for SOA is available with ITCAM for Applications. For more information, see the *ITCAM for SOA User Guide*.

A *service group* is a set of related service operations that collectively might represent or encompass a business function or application in your enterprise. This can consist of a service flow, a subset of a flow, or any collection of operation aggregates that represent something meaningful to you in your monitored environment. A *process group* is a Business Process Management (BPM)-specific group that aggregates elements that are part of a BPM solution, such as applications, modules, components, or operations. A process group allows the monitoring of interactions between the components of the solution. This monitoring provides BPM-specific context information.

Alarm Manager workspace

This workspace displays aggregated information about the alarms for each work manager.

This workspace displays data provided by the Alarm Manager attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains:

- Highest Alarm Rate bar chart, which displays the five highest number of alarms fired per second
- Work Manager Alarms report, which displays detailed information about the alarms for each work manager

Accessing the Alarm Manager workspace

To access this workspace from the Thread Pools workspace, use one of the following procedures:

- Within the Navigator, right-click the **Thread Pools** entry; then from the menu select **Workspace** > **Alarm Manager**.
- From the primary Tivoli Enterprise Portal menu, expand the **View** menu, and select **Workspace** > **Alarm Manager**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Allocation Failures workspace

This workspace summarizes all the heap-allocation failures that occurred within the Java Virtual Machine (JVM) over the current interval and that caused the JVM to initiate garbage collection.

This workspace displays data provided by the Allocation Failure attributes.

Note to Solaris and HP-UX users: Allocation-failure information is not recorded on these platforms; hence this workspace is always empty.

The predefined workspace contains the following items:

- Allocation Failure Elapsed Times bar chart, which displays the number of allocation failures during the current interval
- Heap Usage bar chart, which displays the heap usage for this JVM. The bar's fail over gives the allocation-failure ID number followed by a range of recording times. This allocation-failure number displays in the Allocation Failures report and associates each bar with that particular row within the report
- Allocation Failures report, which displays information about the heap-allocation failure that caused the Java Virtual Machine hosting the application server to start its garbage-collection routine. The Allocation Failures report includes the ASID field.

Accessing the Allocation Failures workspace

To access this workspace from the Garbage Collector Activity workspace, complete the following steps:

- From the Garbage Collection Analysis report, right-click the link icon and from the menu, click **Allocation Failures**. Note that in the Allocation Failure workspace, the ASID is displayed in the Allocation Failures report.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Application - Application Trend at L1 workspace

This workspace displays access trends for individual applications. It provides trend information for request and response times. It also provides trend information for application errors. This workspace provides a broad overview of the health of an application and draws data from multiple attribute groups.

This workspace displays data provided by the Request Analysis and Request Times and Rates attribute groups.

The predefined workspace contains:

- Selected Application Summary report displays application name, average request response time, average request completion rate, error rate, and ASID. For Tivoli Enterprise Monitoring Agent running on z/OS, region ID can be found in the ASID column.
- Response Time Trend chart displays summary trend times for the overall response time for the selected application.
- Error Rate Trend chart displays the error rate for the application.

- Request Rate Trend chart displays the number of requests completed per second for the application.

Accessing the Selected Application - Configuration workspace

Access this workspace using one of the following methods:

- Double click any application in the application server Summary workspace.
- Right-click on application icon in the application server Summary workspace and select **Link To**, then select **Application Trend at L1**.

For additional information, see:

- application server Summary Workspace
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Application - Application Trend at L2/L3 workspace

This workspace displays access trends for individual applications. It provides trend information for request and response times. It also provides trend information for application errors. This workspace provides a broad overview of the health of an application and draws data from multiple attribute groups.

This workspace displays data provided by the Request Analysis and Request Times and Rates attribute groups.

The predefined workspace contains:

- Selected Application Summary report displays application name, average request response time, average request completion rate, error rate, and ASID. For Tivoli Enterprise Monitoring Agent running on z/OS, region ID can be found in the ASID column.
- Response Time Trend chart displays trend times for the following different elements in milliseconds: JNDI, JMS, Application, JCA, SCA, Servlet, EJB, and web service requests.
- Error Rate Trend chart displays the error rate for the application.
- Request Rate Trend chart displays the number of requests completed per second for the application.

Accessing the Selected Application - Configuration workspace

Access this workspace using one of the following methods:

- Double click any application in the application server Summary workspace.
- Right-click on application icon in the application server Summary workspace and select **Link To**, then select **Application Trend at L2/L3**.

For additional information, see:

- application server Summary Workspace
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Application Health workspace

The workspace displays the information about the real-time health status of applications monitored by the Tivoli Enterprise Monitoring Agent.

The health status information is collected from the following sources.

- Request Metrics - performance data that measures request execution time collected from the ITCAM instrumentation points in the application code.
- Resource Metrics - pool usage and container performance statistics collected from the corresponding PMI modules or MBeans.
- GC Metrics - metrics on garbage collection frequency and performance collected from parsing of the GC verbose log file when it is enabled for the application server JVM.
- OS metrics - metrics collected about the JVM process and the whole system execution, such as CPU used percentage, paging rate, and so on.

Additionally, the monitoring agent uses thresholds, called Application Health Indicators, to determine the quality of the application service. For request response times, thresholds are assigned automatically during baselining. You can also manually customize the thresholds. There are three monitored application tiers evaluated for health status.

- Client Tier provides performance data and status of application execution in servlets/JSPs or portal containers as well as corresponding thread pools servicing these containers.
- Application Tier provides application execution metrics of EJB containers and custom requests.
- Backend Tier provides application execution in JDBC, JCA, JMS, JNDI API calls.

This workspace displays data provided by the Application Health Status attributes.

By default, the predefined workspace has the following views:

- Situation Event console view, which shows the event console with activity associated with the Application Health Summary Navigator item and any other workspaces in the group, as well as linked workspaces. The Navigator displays an event icon overlaid on the Application Health Summary node when a situation becomes true. The report is useful when multiple alerts are raised as you can see them all in a single filtered view.
- Application Health Summary report, which shows the report of the application name, status, and health indicator for client, application, and backend tiers health status.

Important: Due to the runtime MBeans configuration, the Tivoli Enterprise Monitoring Agent (Tivoli Enterprise Monitoring Agent) can find only composition units of business-level applications that associate with either web or EJB modules.

If any applications are running on the Business Process Manager server and ITCAM for SOA is installed on the server, an additional link is available. In the Application Health Summary view, right-click any application and select **Selected Application - Group Summary** to view the Group Summary workspace, provided by ITCAM for SOA. In this workspace, you can see the status of all process groups that include any components or operations that are a part of the selected application.

Accessing the Application Health Summary workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems or UNIX Systems, as appropriate for the node you are monitoring.

2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere Application server entry of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **Application Health** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Application Registry workspace

This workspace displays the information about the server configuration for the application.

This workspace displays data provided by the Application Monitoring Configuration attributes.

The predefined workspace contains:

- Situation Event Console report, which shows the event activity for situations associated with the current Navigator item. The Navigator alerts you when a situation becomes true by overlaying the Navigator item with an event indicator. This report is useful when multiple alerts are raised and you might not know newly arrived alerts just by looking at the indicator.
- Application Configuration report, which shows the configurations that are discovered, stored and managed for WebSphere applications running within that application server.

Accessing the Application Registry workspace

To access this workspace from the Application Health Summary workspace, use one of the following procedures:

- Within the Navigator, right-click the **Application Health** entry; then, from the menu, click **Workspace** > **Application Registry**.
- From the primary Tivoli Enterprise Portal menu, click **View** > **Workspace** > **Application Registry**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Business Process Manager workspace

The Business Process Manager workspace displays overall statistics for a Business Process Manager server being monitored by the Tivoli Enterprise Monitoring Agent.

The predefined workspace contains the following items:

- Heap Usage - History bar chart, which displays free memory size and used memory size (in kilo bytes) within the WebSphere application server heap over time. The chart flyovers display the exact values.

This view displays data provided by the Garbage Collection Analysis attributes.

- Response Time - History graph, which shows the server response time to requests over time

  This view displays data provided by the Request Times and Rates attributes.
- Request Rate - History graph, which shows the rate at which requests have been received by this server over time

  This view displays data provided by the Request Times and Rates attributes.
- Percent CPU Used - History graph, which shows the percentage of the CPU that this server consumed over time

  This view displays data provided by the application server attributes.
- Application server summary report, which displays overall information about this WebSphere application server, including JVM statistics and CPU usage statistics

  This view displays data provided by the application server attributes.

Accessing the Business Process Manager workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, right-click a **Business Process Manager** entry, and select **Workspaces** > **Business Process Manager**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Cache Analysis workspace

This workspace reports information about the dynamic cache.

WebSphere application server consolidates several caching activities, including servlets, web services, and WebSphere commands, into one service called the *dynamic cache*. These caching activities work together to improve application performance. The activities share many configuration parameters, which are set in a *dynamic cache service* in an application server. The dynamic cache works within a Java Virtual Machine (JVM) within an application server, intercepting calls to cacheable objects, for example, through a servlet service method or an execute method on a command. The dynamic cache either stores the object output to or serves the object content from the dynamic cache.

This workspace displays data provided by both the Dynamic Cache attributes and the Dynamic Cache Templates attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report

resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.

- Because of high overhead, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- In-memory Cache Sizes - History graph, which shows the sizes of in-memory cache entries for the specified interval
- Highest Miss Rates bar chart, which shows the most frequent cache entry misses (per second). The Y-axis headings correspond to the row number of the Dynamic Cache Templates report
- Dynamic Cache report, which displays information about the dynamic cache, including cache sizes and timeout rates
- Dynamic Cache Templates report, which displays information about the cache template data. A cache template is an object type defined by a cache policy specified in WebSphere application server file cachespec.xml. A cache policy specifies the caching rules and indicates what is cached, the invalidation and timeout conditions, and other data

Accessing the Cache Analysis workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **Cache Analysis** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Client Communications workspace

This workspace provides overall Service Integration Bus communication performance data and counters for all clients connected to this application server. WebSphere application server 5.1 based products do not support this workspace.

This workspace displays data provided by the Client Communications attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report

resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.

- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Connection Count - History graph, which shows the number of API sessions used by clients that were network connected to this application server
- Error Count - History graph, which shows the communication errors that occurred and that resulted in the disconnection of a network connection to a client
- Communication Statistics report, which displays information about client communications, including API connections, errors, reads, writes, sent priority, received priority, MessageSent priority, and MessageReceived priority

Accessing the Client Communications workspace

To access this workspace from the Platform Messaging workspace, use one of the following procedures:

- Within the Navigator, right-click the **Platform Messaging** entry; then from the menu, click **Workspace** > **Client Communications**.
- From the primary Tivoli Enterprise Portal menu, click **View** > **Workspace** > **Client Communications**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Container Object Pools workspace

This workspace displays aggregate information about the object pools associated with Enterprise Java Beans (EJBs). It provides a view of pool performance for all Enterprise Java Beans deployed to each container.

This workspace displays data provided by the Container Object Pools attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Object Pool Rates - History graphs, which show the retrieval, return, discard, and drain rates for the EJBs in each EJB container
- Container Object Pools report, which displays:
  - Aggregated information for each defined EJB container that aggregates bean object pool performance for all Enterprise beans deployed to that container
  - Aggregated information for the application server that aggregates bean object pool performance data for all Enterprise beans deployed to the application server

Accessing the Container Object Pools workspace

To access this workspace from the EJB Containers workspace, use one of the following procedures:

- From the primary Tivoli Enterprise Portal menu, click **View** > **Workspace** > **Container Object Pools**.
- Within the Navigator, right-click the **EJB Containers** entry; then, from the menu, click **Workspace** > **Container Object Pools**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Container Transactions workspace

This workspace displays data about the activities and transactions running in each application server.

This workspace displays data provided by the Container Transactions attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Transaction Rates - History graph, which shows the per-second begin, commit, and rollback rates over time for local and global transactions
- Transaction Durations - History graph, which shows the amount of time it takes to complete local and global transactions
- Container Transactions report, which displays performance information for global and local transactions that run in each defined EJB container and an aggregated value for all transactions that run in the application server

Accessing the Container Transactions workspace

To access this workspace from the EJB Containers workspace, use one of the following procedures:

- From the primary Tivoli Enterprise Portal menu, click **View** > **Workspace** > **Container Transactions**.
- Within the Navigator, right-click the **EJB Containers** entry; then, from the menu, click **Workspace** > **Container Transactions**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Data sources workspace

The data sources workspace displays statistical data for the data sources that your applications reference when accessing databases.

This workspace displays data provided by the Datasources attributes.

The predefined workspace contains the following items:

- Worst Datasource Query Times bar chart, which shows the longest times (in milliseconds) the application spent waiting to retrieve data from the database during the specified interval
- Worst Datasource Update Times bar chart, which shows the longest times (in milliseconds) the application spent updating data within the database during the specified interval
- Datasources - Current Interval report, which displays database usage information. For example, this report shows traffic information such as the time the application spent trying to connect to the database, and the total and average processing times for database queries and updates.

Accessing the Data sources workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **Datasources** entry.

Selected Data source - History workspace

The Selected Datasource - History workspace displays the historical information that corresponds to the information in the Datasource workspace for a selected data source. Historical information is collected over a specific time span. See the online help for Tivoli Enterprise Portal for a detailed explanation of historical reporting.

Accessing the Selected Data source - History workspace

To access this workspace from the Datasource workspace, use one of the following procedures:

- From the Datasources - Current Interval report, right-click the link icon and from the menu, click **Selected Datasource - History**.
- From Worst Datasource Query Times bar chart or the Worst Datasource Update Times bar chart, right-click any bar; then, from the menu, click **Link To** > **Selected Datasource - History**.

Selected Data source - Datasource Trend workspace

The Datasources Trend workspace displays information about datasource connections. This workspace displays data provided by the Datasources attributes.

This predefined workspace contains the following items:

- Current Datasources report displays datasource name, total wait time, connection rate, connection average wait time and connection max wait time. For Tivoli Enterprise Monitoring Agent running on z/OS, region ID can be found in the ASID column.
- Total Wait Time chart displays the total time that applications had to wait for a connection to the data source.
- Connection Rate Trend chart displays the number of connection requests created for the data source per second.
- Connection Average and Max Time Trend chart display the average time in milliseconds and the worst-case time in milliseconds that applications had to wait for a connection.

Accessing the Selected Data source - Datasource Trend workspace

Right-click the **Datasources** workspace, select **Workspace** and then **Datasource Trend** workspace

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Accessing the managing server visualization engine from the Datasources workspace

Important: To use this functionality, you need ITCAM for Application Diagnostics Managing Server.

In the Tivoli Enterprise Portal, access the **Datasources** workspace. You can use the **Diagnostic Server Activity Display** link to access the managing server visualization engine. For information about access requirements, see "Prerequisites for access" on page 62.

1. In the **Datasources - Current Interval** window, right-click the **choose link** icon  then click **Diagnostic Server Activity Display**.
2. If this is your first time to access the Managing server visualization agent during a session, you see a **Welcome to the Application Monitor** page.

3. Depending on the user setup configuration in your environment you might have to type your managing server visualization engine **User Name** and **Password**. If you do, you need only to log in using your **User Name** and **Password** once per session. Click **OK** to display the **Server Activity Display** page in the managing server Visualization engine. You can use this page to diagnose application problems, for example, slow transactions or high response times.
4. In a z/OS environment, right-click the link icon on a row where the ASID column displays Summary.
   a. Click **Selected Datasource- Servant Regions**.
   b. In the **Selected Datasource - Servant Regions** table, right-click the link icon on a row.
   c. Click **Diagnostic Server Activity Display**.
5. For more information about the options available in a z/OS environment, see "Region workspaces in a z/OS environment" on page 136 and "Accessing a Region workspace" on page 138.
6. The results in this page relate directly to the context from where you launched the link in the Tivoli Enterprise Portal. For more information about using the **Server Activity Display** page, and additional features refer to the Composite Application Manager help within the managing server visualization agent Interface.
7. To return to the previous workspace in the Tivoli Enterprise Portal interface at any time choose from the following options:
   - From the Tivoli Enterprise Portal desktop client, including WebStart, click the back arrow on the Portal toolbar.
   - From the Tivoli Enterprise Portal browser client, click the browser back arrow.

For additional information, see:

- "Workspace link to managing server visualization engine" on page 61.
- "Access the managing server visualization engine from the Tivoli Enterprise Portal" on page 65

DB Connection Pools workspace

This workspace displays information about the database connection pools associated with each application server.

You can use this workspace to monitor Java Database Connectivity (JDBC) performance for WebSphere application server applications. This workspace displays data provided by the DB Connection Pools attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of the high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must

first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Highest Average Pool Sizes bar chart, which shows the largest average size (that is, number of connections) for each database connection pool
- Worst Wait Times bar chart, which shows the worst wait times (in milliseconds) for each database connection pool
- Highest Allocation Rates bar chart, which shows the rate at which database connections are being made for each connection pool
- DB Connection Pools report, which displays information about the database connection pool for each defined data source. The report also displays an aggregated value that aggregates over all data sources. For example, this report displays the number of threads waiting for a connection and the number of connections created and released

Accessing the DB Connection Pools workspace

To access this workspace, complete the following steps:

1. In the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server entry of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **DB Connection Pools** entry.

Selected DB Connection Pool - History workspace

The Selected DB Connection Pool - History workspace displays historical information that corresponds to the information in the DB Connection Pools workspace for a selected connection pool. Historical information is collected over a specific time span. See the online help for Tivoli Enterprise Portal for a detailed explanation of historical reporting.

Accessing the Selected DB Connection Pool - History workspace

To access this workspace from the DB Connection Pools workspace, use one of the following procedures:

- From the DB Connection Pools report, right-click the link icon and from the menu, click **Selected DB Connection Pool - History**.
- From the Highest Average Pool Sizes bar chart, the Worst Wait Times bar chart, or the Highest Allocation Rates bar chart, right-click any bar; then, from the menu, click **Link To** > **Selected DB Connection Pool - History**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Accessing the managing server visualization engine from the DB Connection Pools workspace

Important: To use this functionality, you need ITCAM for Application Diagnostics Managing Server.

In the Tivoli Enterprise Portal access the DB Connection Pools workspace. You can use the **Diagnostic Server Activity Display** link to access the managing server visualization engine. For information about access requirements, see "Prerequisites for access" on page 62.

1. In the **DB Connection Pools** window, right-click the **choose link** icon  then click **Diagnostic Server Activity Display**.
2. If this is your first time accessing the managing server visualization agent during a session, you see a **Welcome to the Application Monitor** page.
3. Depending on the user setup configuration in your environment you might have to type your managing server visualization engine **User Name** and **Password**. If you do, you need only log in once per session using your **User Name** and **Password**.
4. Click **OK** to display the **Server Activity Display** page in the managing server Visualization engine. You can use links to diagnose application problems, for example, slow transactions or high response times.
5. The results relate directly to the context from where you launched the link in the Tivoli Enterprise Portal. For more information about using the **Server Activity Display** page and additional features, refer to the Composite Application Manager help within the managing server visualization agent Interface.
6. To return to the previous workspace in the Tivoli Enterprise Portal interface at any time choose from the following options:
   - From the Tivoli Enterprise Portal desktop client, including WebStart, click the back arrow on the Portal toolbar.
   - From the Tivoli Enterprise Portal browser client, click the browser back arrow.

For additional information, see:

- "Workspace link to managing server visualization engine" on page 61
- "Access the managing server visualization engine from the Tivoli Enterprise Portal" on page 65

DCS Stacks workspace

This workspace displays aggregated information about each DCS stack within the entire WebSphere application server domain, including multiple nodes and servers.

This workspace displays data provided by the DCS Stack attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.

- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Highest Message Buffer Reallocations bar chart, which displays the highest number of message buffer reallocations that occurred as a result of inadequate buffer size
- Most Sent Messages bar chart, which shows most frequent number of message buffer reallocations that occurred as a result of inadequate buffer size
- High Severity Congestion Events bar chart, which shows the number of times that a high severity congestion event for outgoing messages was raised
- DCS Statistics report, which displays information for the DCS stack data, including incoming and outgoing message size, sent messages, and high severity congestion events

Accessing the DCS Stacks workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **DCS Stacks** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Destinations workspace

In this workspace, you can view performance data and counters for the destinations of a selected messaging engine.

A destination is a virtual location within a service integration bus, to which applications attach as producers, consumers, or both, to exchange messages. There are two types of destinations, queues and topic spaces. WebSphere application server 5.1 based products do not support this workspace. This workspace displays data provided by both the Topic Spaces attributes and the Queue attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report

resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.

- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains:

- Queue report, which displays information about the queue data. A queue is a destination for point-to-point messaging
- Topic Spaces report, which displays information about the topic space data. A topic space is a destination for publish/subscribe messaging

Accessing the Destinations workspace

To access this workspace from the "Messaging workspace" on page 101, complete one of the following steps:

- From the Messaging Engines report, right-click the link icon and from the menu, click **Destinations**.
- From Average Local Wait Time - History graph, Expired Messages - History graph, Incomplete Topic Publications - History graph, or Total Published - History graph, right-click any bar; then, from the menu, click **Link To** > **Destinations**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Durable Subscriptions workspace

In this workspace, you can view statistic counters for the durable subscriptions of a selected topic.

The default messaging provider supports the use of durable subscriptions to topics. This enables a subscriber to receive a copy of all messages published to a topic, even messages published during periods of time when the subscriber is not connected to the server. WebSphere application server 5.1 based products do not support this workspace. This workspace displays data provided by the Durable Subscriptions attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Durable Subscriptions report, which displays information about durable subscriptions that pertain to a selected topic, including the number of messages consumed, and message wait time

Accessing the Durable Subscriptions workspace

To access this workspace from the Destinations workspace, complete the following step:

- From the Topic Spaces report, right-click the link icon and from the menu, click **Durable Subscriptions**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

EJB Containers workspace

This workspace displays aggregated information about each defined EJB.

This workspace displays aggregated bean performance data for all Enterprise beans deployed to an EJB container. It also displays aggregated information for the application server that aggregates bean performance data for all Enterprise beans deployed on the application server. This workspace displays data provided by the EJB Containers attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Method Average Response Time - History graph, which shows the average response time for methods invoked by the EJBs in the container
- Method Invocation Rate - History graph, which shows the rate at which the methods of an EJB container were invoked
- EJB Containers report, which displays aggregated information for each defined EJB container that aggregates bean performance data for all Enterprise beans deployed to that container. The report also displays aggregated information for the application server that aggregates bean performance data for all Enterprise beans deployed to the application server. For example, this report displays load values, response times, and life cycle activities for Enterprise beans

Accessing the EJB Containers workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **EJB Containers** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Accessing the managing server visualization engine from the EJB Containers workspace

Important: To use this functionality, you need ITCAM for Application Diagnostics Managing Server.

In the Tivoli Enterprise Portal access the EJB Containers workspace. You can use the **Diagnostic Server Activity Display** link to access the managing server visualization engine. For information about access requirements, see "Prerequisites for access" on page 62.

1. In the **EJB Containers** window, right-click the **choose link** icon  then click **Diagnostic Server Activity Display**.
2. If this is your first time to access the managing server visualization engine during a session, you see a **Welcome to the Application Monitor** page.
3. Depending on the user setup configuration in your environment you might have to type your managing server visualization engine **User Name** and **Password**. If you do, you need only log in once per session using your **User Name** and **Password**.
4. Click **OK** to display the **Server Activity Display** page in the managing server Visualization engine. You can use link to diagnose application problems, for example, slow transactions or high response times.
5. The results relate directly to the context from where you launched the link in the Tivoli Enterprise Portal. For more information about using the **Server Activity Display** page and additional features, refer to the Composite Application Manager help within the managing server visualization agent Interface.
6. To return to the previous workspace in the Tivoli Enterprise Portal interface at any time choose from the following options:
   - From the Tivoli Enterprise Portal desktop client, including WebStart, click the back arrow on the Portal toolbar.
   - From the Tivoli Enterprise Portal browser client, click the browser back arrow.

For additional information, see:

- "Workspace link to managing server visualization engine" on page 61

- "Access the managing server visualization engine from the Tivoli Enterprise Portal" on page 65

Enterprise Java Beans workspace

This workspace reports information about each Enterprise Java Bean (EJB) defined for an EJB container.

The workspace provides information about these beans that relates to their identity, instrumentation level settings, creation and destruction of bean objects, response times, invocations, calls, and rates for retrievals, returns, and discards. This workspace displays data provided by the Enterprise Java Beans attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Worst Method Response Times bar chart, which shows the worst response times (in milliseconds) for methods invoked by each bean instance
- Highest Method Invocation Rates bar chart, which shows the methods that are invoked most often by each bean instance
- Enterprise Java Beans report, which shows performance information about each EJB deployed to the application server. This report displays information about bean activity, including the rates at which beans are being instantiated and destroyed

Accessing the Enterprise Java Beans workspace

You access this workspace from the EJB Containers workspace. To list the EJBs for all containers, use one of the following procedures:

- From the primary Tivoli Enterprise Portal menu, click **View** > **Workspace** > **Enterprise Java Beans**.
- Within the Navigator, right-click the **EJB Containers** entry; then, from the menu, click **Workspace** > **Enterprise Java Beans**.

To see the EJBs referenced by a specific EJB container, complete the following step:

- From the EJB Containers report, right-click the link icon and from the menu, click **Enterprise Java Beans**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Garbage Collections - Selected Allocation Failure workspace

This workspace provides detailed information about the garbage-collection cycles that occurred in response to a specific heap-allocation failure that occurred within the Java Virtual Machine.

This workspace displays data provided by the Garbage Collection Cycle attributes.

Note to Solaris and HP-UX users: Allocation-failure information is not recorded on these platforms. Consequently, this workspace is always empty.

The predefined workspace contains the following items:

- GC Elapsed Times bar chart, which breaks down the mark, sweep, and compact times (in milliseconds) for each garbage-collection cycle that occurred for the selected allocation failure
- Heap Usage bar chart, which displays the JVM heap usage (kilobytes in use, freed, and free at start of garbage collection) for each garbage-collection cycle
- Garbage Collections - Selected Allocation Failure report, which displays information about a single garbage-collection cycle that the JVM hosting the application server performed. For example, this report displays the free heap space both before and after garbage collection, the heap space freed, and the number of objects moved during garbage collection. For Tivoli Enterprise Monitoring Agent running on z/OS, region ID can be found in the ASID column.

Accessing the Garbage Collections - Selected Allocation Failure workspace

To access this workspace from the Allocation Failures workspace, use one of the following procedures:

- From the Allocation Failures report, right-click the link icon and from the menu, click **Garbage Collections - Selected Allocation Failure**.
- From the Allocation Failure Elapsed Times bar chart or the Heap Usage - History bar chart, right-click any bar; then, from the menu, click **Link To** > **Garbage Collections - Selected Allocation Failure**.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Garbage Collection Analysis workspace

This workspace summarizes all the Java Virtual Machine (JVM) garbage-collector activity over a user-defined interval.

The JVM generates detailed garbage collection logs for an application server when started with the **verbose:gc** runtime parameter. This workspace displays data provided by the Garbage Collection Analysis attributes.

The predefined workspace contains the following items:

- Garbage Collection Rate - History graph, which displays the rate at which the garbage-collection algorithm is being invoked
- Heap Usage - History bar chart, which displays the high-water mark of free storage (in kilobytes) available in the heap after each garbage-collector run

- Percentage of Time Garbage Collector Running - History graph, which displays the percentage of real time the garbage collector was running during the current interval, for each server region
- Garbage Collection Analysis report, which displays information about the garbage-collection activities within the Java Virtual Machine that is hosting the application server. For example, this report displays the number of times the collector ran during the interval and the resulting number of objects that the collector freed

Accessing the Garbage Collection Analysis workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the name of the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **Garbage Collection Analysis** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Accessing the managing server visualization engine from the Garbage Collection Analysis workspace

Important: To use this functionality, you need ITCAM for Application Diagnostics Managing Server.

In the Tivoli Enterprise Portal navigate to the **Garbage Collection Analysis** workspace. You can use the **Diagnostic Server Activity Display** link to access the managing server visualization engine. For information about access requirements, see "Prerequisites for access" on page 62.

1. In the **Garbage Collection Analysis** window, right-click the **choose link** icon  then click **Diagnostic Memory Leak**.
2. If this is the first time you access the managing server visualization agent, you see a **Welcome to the Application Monitor** page.
3. Depending on the user setup configuration in your environment you might have to type your managing server visualization engine **User Name** and **Password**. If you do, you must log in only once per session using your **User Name** and **Password**.
4. Click **OK** to display the **Memory Leak Confirmation report** page in the managing server visualization engine. You can use this page to diagnose memory leak problems.
5. In a z/OS environment, right-click the link icon on a row where the ASID column displays Summary.
   a. Click **Garbage Collection Analysis Servant Regions**.

b. In the **Garbage Collection Analysis - Servant Regions** table, right-click the link icon on a row.
c. Click **Diagnostic Memory Leak**.

6. For information about Creating a Memory Leak Confirmation report in this page, and additional features refer to the Composite Application Manager help within the managing server visualization engine Interface.
7. To return to the previous workspace in the Tivoli Enterprise Portal interface at any time choose from the following options:
   - From the Tivoli Enterprise Portal desktop client, including WebStart, click the back arrow on the Portal toolbar.
   - From the Tivoli Enterprise Portal browser client, click the browser back arrow.

For additional information, see:

- "Workspace link to managing server visualization engine" on page 61.
- "Access the managing server visualization engine from the Tivoli Enterprise Portal" on page 65

High Availability Manager workspace

The High Availability Manager workspace provides aggregated information about high availability managers.

This workspace displays data provided by the High Availability Manager attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set the Resource Data Collection Method configuration value to **On Demand**) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Local Group - History graph, which shows the number of local groups.
- Group State Rebuild Time - History graph, which shows the time taken to rebuild the global group state in milliseconds.
- High Availability Manager report, which displays information about the high availability manager, including group state rebuild time, bulletin-board subjects, bulletin-board subscriptions, bulletin-board rebuild time, and local bulletin-board subjects

Accessing the High Availability Manager workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.

2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **High Availability Manager** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

IMAP/POP workspace

This workspace provides aggregated statistics of the usage information about the IMAP service and the POP3 service connectivity, especially for the performance-related connectivity.

This workspace displays data provided by the Workplace Mail IMAP/POP attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

Important: This workspace does not support linking to ITCAM for Application Diagnostics Managing Server visualization engine.

The predefined workspace contains the following items:

- Active Sessions bar chart, which displays the number of active sessions during the sampling interval
- Authentication Failures bar chart, which displays the number of authentications failures during the sampling interval
- Workplace Mail report, which displays detailed information about the workplace mail for each protocol

Accessing the IMAP/POP workspace

To access this workspace from the Workplace Mail workspace, use one of the following procedures:

- Within the Navigator, right-click the **Workplace Mail** entry; then from the menu, click **Workspace** > **IMAP/POP**.

- From the primary Tivoli Enterprise Portal menu, click **View** > **Workspace** > **IMAP/POP**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

J2C Connection Pools workspace

This workspace reports information about resource adapters and connectors that adhere to J2C, the WebSphere application server implementation of the JEE Connector Architecture (JCA).

Data counters for this category contain usage information about the J2C connection pools that enable enterprise beans to connect to and interact with systems such as the Customer Information Control System (CICS®) and the Information Management System (IMS™). This workspace displays data provided by the J2C Connection Pools attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Highest Average Pool Sizes bar chart, which shows the largest average number of managed connections for each J2C connection pool. The Y-axis headings correspond to the row number of the J2C Connection Pools report
- Worst Wait Times bar chart, which shows the worst wait time (in milliseconds) for each of the J2C connection pools. The y-axis headings correspond to the row number of the J2C Connection Pools report
- Highest Allocation Rates bar chart, which displays the highest managed-connection creation, destruction, and allocation rates (in events per second)
- J2C Connection Pools report, which displays information about connectors that adhere to J2C. For example, this report displays the number of managed connections or physical connections and the total number of connections or connection handles

Accessing the J2C Connection Pools workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.

3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **J2C Connection Pools** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Accessing the managing server visualization engine from the J2C Connection Pools workspace

Important: To use this functionality, you need ITCAM for Application Diagnostics Managing Server.

In The Tivoli Enterprise Portal access the J2C connection pools workspace. You can use the **Diagnostic Server Activity Display** link to access the managing server visualization engine. For information about access requirements see "Prerequisites for access" on page 62.

1. In the **J2C connection pools** window, right-click the **choose link** icon  then click **Diagnostic Server Activity Display**.
2. If this is your first time to access the managing server visualization agent during a session, you see a **Welcome to the Application Monitor** page.
3. Depending on the user setup configuration in your environment you might have to type your managing server visualization engine **User Name** and **Password**. If you do, you need to log in only once per session using your **User Name** and **Password**.
4. Click **OK** to display the **Server Activity Display** page in the managing server Visualization engine. You can use link to diagnose application problems, for example, slow transactions or high response times.
5. The results relate directly to the context from where you launched the link in the Tivoli Enterprise Portal. For more information about using the **Server Activity Display** page and additional features, refer to the Composite Application Manager help within the managing server visualization agent Interface.
6. To return to the previous workspace in the Tivoli Enterprise Portal interface at any time choose from the following options:
   - From the Tivoli Enterprise Portal desktop client, including WebStart, click the back arrow on the Portal toolbar.
   - From the Tivoli Enterprise Portal browser client, click the browser back arrow.

For additional information, see:

- "Workspace link to managing server visualization engine" on page 61
- "Access the managing server visualization engine from the Tivoli Enterprise Portal" on page 65

JMS Summary workspace

The JMS Summary workspace displays information about queues being used by your applications using the Java Message Service (JMS) interface.

The JMS Summary workspace also provides information about how WebSphere application server applications are using WebSphere MQ. It displays such information as the number of messages read and written and which queue managers and queues were used during the interval.

This workspace displays data provided by the JMS Summary attributes.

The predefined workspace contains the following items:

- Worst JMS Send Times bar chart, which displays the longest times (in milliseconds) your application spent putting messages onto a queue during the interval
- Worst JMS Receive Times bar chart, which displays the longest times (in milliseconds) your application spent getting messages from a queue during the interval
- Worst JMS Browse Times bar chart, which displays the longest times (in milliseconds) your application spent browsing messages on a queue during the interval
- JMS Summary - Current Interval report, which displays detailed information about how the WebSphere application server uses messaging middleware (that is, WebSphere MQ) using JMS. Details include the send, receive, browse, and publish times for your application. It also includes such information as, which queue managers and queues are being used and how many messages are being read and written

Accessing the JMS Summary workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **JMS Summary** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Accessing the managing server visualization engine from the JMS Summary workspace

Important: To use this functionality, you need ITCAM for Application Diagnostics Managing Server.

In The Tivoli Enterprise Portal access the **JMS Summary** workspace. You can use the **Diagnostic Server Activity Display** link to access the managing server visualization engine. For information about access requirements, see "Prerequisites for access" on page 62.

1. In the **JMS Summary - Current interval** window, right-click the **choose link** icon  then click **Diagnostic Server Activity Display**.
2. If this is your first time to access the managing server visualization agent during a session, you see a **Welcome to the Application Monitor** page.
3. Depending on the user setup configuration in your environment you might have to type your managing server visualization engine **User Name** and **Password**. If you do, you need to log only once per session using your **User Name** and **Password**.
4. Click **OK** to display the **Server Activity Display** page in the managing server Visualization engine. You can use this link to diagnose application problems, for example, slow transactions or high response times.
5. In a z/OS environment, right-click the link icon on a row where the ASID column displays Summary.
   a. Click **Selected JMS - Servant Regions**.
   b. In the **Selected JMS - Servant Regions** table, right-click the link icon on a row.
   c. Click **Diagnostic Server Activity Display**.
6. For more information about the options available in a z/OS environment, refer to "Region workspaces in a z/OS environment" on page 136 and "Accessing a Region workspace" on page 138.
7. The results in this page relate directly to the context from where you launched the link in the Tivoli Enterprise Portal. For more information about using the **Server Activity Display** page, and additional features refer to the Composite Application Manager help within the managing server visualization agent Interface.
8. To return to the previous workspace in the Tivoli Enterprise Portal interface at any time choose from the following options:
   - From the Tivoli Enterprise Portal desktop client, including WebStart, click the back arrow on the Portal toolbar.
   - From the Tivoli Enterprise Portal browser client, click the browser back arrow.

For additional information, see:

- "Workspace link to managing server visualization engine" on page 61.
- "Access the managing server visualization engine from the Tivoli Enterprise Portal" on page 65

JVM Stack Trend workspace

This workspace displays trend data regarding JVM CPU usage, JVM garbage collection, and JVM heap usage.

This workspace displays data provided by the application server and Garbage Collection Analysis attribute groups.

The predefined workspace contains:

- JVM CPU Trend chart indicates the percentage of the JVM CPU used.
- Percent GC Time Used chart

- Heap Usage Trend chart

Accessing the Selected Application - Configuration workspace

Access this workspace using one of the following methods:

- Double click the JVM icon in Resources workspace.
- Right-click the JVM icon in the Resources workspace and select **Link To**, then select **JVM Stack Trend**.

For additional information, see:

- Resources and Applications workspaces
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Log Analysis workspace

This workspace reports application server error and exception conditions as recorded in the application server log file.

This workspace displays data provided by both the Log Analysis attributes and DC Messages attributes.

The predefined workspace contains the following items:

- DC Message Events, which display aggregated information about the messages from WebSphere data collector
- Log Analysis report, which displays application server error and exception conditions as recorded in the application server log file, SystemOut.log. This information includes the exception severity as well as the ID and text of the associated message. In the Log Analysis report, if the PID value is displayed as `-1`, it indicates that the data collector is disconnected. If a WebSphere server shutdown occurs, the connection between the data collector and Tivoli Enterprise Monitoring Agent is closed but the data collector continues to write to log files. Tivoli Enterprise Monitoring Agent processes these records but sets the PID value to `-1`.

Accessing the Log Analysis workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **Log Analysis** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Lotus Workplace Server workspace

The Lotus Workplace Server workspace displays overall statistics for each Lotus Workplace application server being monitored by the Tivoli Enterprise Monitoring Agent.

Important: This workspace does not support linking to ITCAM for Application Diagnostics Managing Server visualization engine.

The predefined workspace contains the following items:

- Heap Usage - History bar chart, which displays free memory size and used memory size (in kilo bytes) within the WebSphere application server heap over time. The chart flyovers display the exact values

  This view displays data provided by the Garbage Collection Analysis attributes.
- Response Time - History graph, which shows the server response time to requests over time

  This view displays data provided by the Request Times and Rates attributes.
- Request Rate - History graph, which shows the rate at which requests have been received by this server over time

  This view displays data provided by the Request Times and Rates attributes.
- Percent CPU Used - History graph, which shows the percentage of the CPU that this server consumed over time

  This view displays data provided by the application server attributes.
- Application server Summary report, which displays overall information about this WebSphere application server, including JVM statistics and CPU usage statistics

  This view displays data provided by the application server attributes.

Accessing the Lotus Workplace Server workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, click the **Lotus Workplace Server** entry of your choice.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Messages Queues workspace

This workspace provides aggregated statistics about the usage information about the message delivery on Lotus Workplace servers.

This workspace displays data provided by the Workplace Mail Queues attributes.

Note:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

Important: This workspace does not support linking to ITCAM for Application Diagnostics Managing Server visualization engine.

The predefined workspace contains the following items:

- Queue Messages bar chart, which displays the number of messages in the ready, retry, unprocessed, and dead state in the queue during the sampling interval
- Workplace Mail Message Queues report, which displays detailed information about the state of messages in each queue

Accessing the Messages Queues workspace

To access this workspace from the Workplace Mail workspace, use one of the following procedures:

- Within the Navigator, right-click the **Workplace Mail** entry; then from the menu, click **Workspace** > **Messages Queues**.
- From the primary Tivoli Enterprise Portal menu, click **View** > **Workspace** > **Messages Queues**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Messaging Engine Communications workspace

This workspace provides aggregated counter statistics for all the messaging engines being hosted by the current application server. WebSphere application server 5.1 based products do not support this workspace.

This workspace displays data provided by the Messaging Engine Communications attributes.

Note:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must

first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Situation Event Console report, which shows the event activity for situations associated with the current Navigator item and any items within the branch. The Navigator alerts you when a situation becomes true by overlaying the Navigator item with an event indicator. This report is useful when multiple alerts are raised and you might not know newly arrived alerts just by looking at the indicator.
- Messaging Engine Communications report, which displays information about the messaging engine communications, including API connections, errors, reads, writes, message written and message read.

Accessing the Messaging Engine Communications workspace

To access this workspace from the Platform Messaging workspace, use one of the following procedures:

- Within the Navigator, right-click the **Platform Messaging** entry; then, from the menu, click **Workspace** > **Messaging Engine Communications**.
- From the primary Tivoli Enterprise Portal menu, click **View** >**Workspace** > **Messaging Engine Communications**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Messaging workspace

In this workspace, you can view of performance counters of the Messaging Engines supported by a server. WebSphere application server 5.1 based products do not support this workspace.

This workspace displays data provided by the Messaging Engines attributes.

Note:

- This workspace reports zeros for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Average Local Wait Time - History graph, which shows the historical time spent by messages on this durable subscription on consumption
- Expired Messages - History graph, which shows the number of report-enabled messages that expired while on this queue

- Incomplete Topic Publications - History graph, which shows the number of publications not yet received by all historical subscribers.
- Total Published - History graph, which shows the historical number of publications to the messaging engines.
- Messaging Engines report, which displays the aggregated information about each messaging engine. A messaging engine is a server component that provides the core messaging functionality of a service integration bus. A messaging engine manages bus resources and provides a connection point for applications

Accessing the Messaging workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **Platform Messaging** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

OS Stack workspace

This workspace displays information about the operating system performance.

This workspace displays data provided by the application server attribute group.

The predefined workspace contains:

- Current OS Stack Summary report which displays:
  - Server name
  - Platform CPU Used (ms)
  - System Paging

  Important: The feature Platform CPU Used (ms) does not apply the z/OS platform.
- CPU Used chart
- System Paging chart

Accessing the Selected Application - Configuration workspace

Access this workspace using one of the following methods:

- Double click the OS icon in Resources workspace.
- Right-click the OS icon in the Resources workspace and select **Link To**, then select **OS Stack Trend**.

For additional information, see:

- Resources and Applications workspaces
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Pool Analysis workspace

This workspace displays information about the usage of several types of pools associated with each application server, including web container pools, ORB pools, J2C connection pools, and database connection pools. This workspace helps you detect resource constraints and potential performance congestion.

Important:

- This workspace reports zeros for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Web Container Pool Usage - History graph, which shows the configured maximum number of web container pooled threads and the average active threads in the web container pool

  This view displays data provided by the Thread Pools attributes.
- ORB Pool Usage - History graph, which shows the configured maximum number of ORB pooled threads and the average active threads in the ORB pool

  This view displays data provided by the Thread Pools attributes.
- Web Container Pool % at Max - History bar chart, which shows the maximum usage percentage for the web container pooled threads over time

  This view displays data provided by the Thread Pools attributes.
- ORB Pool % at Max - History bar chart, which shows the maximum usage percentage for the ORB pooled threads over time

  This view displays data provided by the Thread Pools attributes.
- Percent CPU Used - History graph, which shows the percentage of the CPU used over time

  This view displays data provided by the application server attributes.
- DB Connection % at Max - Current Interval bar chart, which shows the maximum usage percentage for a database connection pool over time

  This view displays data provided by the DB Connection Pools attributes.
- J2C Connection % at Max - Current Interval bar chart, which shows the maximum usage percentage for a J2C connection pool over time

  This view displays data provided by the J2C Connection Pools attributes.

Accessing the Pool Analysis workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **Pool Analysis** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Portal Pages Summary workspace

This workspace reports performances statistics about WebSphere Portal page response times completed on the interval. A historical version of this workspace provides a long-term view of a single portal page that you select.

The following workspace displays only if the request monitoring control level, monitoring level is set to Level2. For more information about the request monitoring control level, see "Application Dashboard (Basic) tab" on page 59.

This workspace displays data provided by the Portal Page Summary attributes.

The predefined workspace contains the following items:

- Worst Response Times bar chart, which displays the worst average response times (in milliseconds) for portlet during the current interval
- Most Popular Portal Pages bar chart, which shows the number of requests for portlet
- Portal Pages report, which displays aggregated information about portal pages, including average response time and request count

Accessing the Portal Pages Summary workspace

To access this workspace from the Portal Summary workspace, use one of the following procedures:

- Within the Navigator, right-click the **Portal Summary** entry; then, from the menu, click **Workspace** > **Portal Pages Summary**.
- From the primary Tivoli Enterprise Portal menu, click **View** > **Workspace** > **Portal Pages Summary**.

Selected Portal Page - History workspace

The Selected Portal Page - History workspace displays the historical information that corresponds to the information in the Portal Pages Summary workspace for a selected portal page. Historical information is collected over a specific time span. See the online help for Tivoli Enterprise Portal for a detailed explanation of historical reporting.

Accessing the Selected Portal Page - History workspace

To access this workspace from the Portal Pages Summary workspace, use one of the following procedures:

- From the Portal Pages report, right-click the link icon and from the menu, click **Selected Portal Page - History**.
- From the Worst Response Times bar chart, or the Most Popular Portal Pages bar chart, right-click any bar; then, from the menu, click **Link To** > **Selected Portal Page - History**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Portal Summary workspace

The workspace reports summarize statistics about response times and functional decomposition of additional requests collected for WebSphere Portal applications. These include statistics about Portal Pages/Gateway Servlet aggregated response times collected on the interval. Others find grained statistics about Portlet, Model Building, Page Loading, Authentication, and Authorization requests response times collected on the same interval. By default, this workspace is configured for long-term historical interval reporting.

The following workspace displays only if the request monitoring control level, monitoring level is set to Level2. For more information about the request monitoring control level, see "Application Dashboard (Basic) tab" on page 59.

This workspace displays data provided by the Portal Summary attributes.

The predefined workspace contains the following items:

- Portal Pages/Gateway Servlet - History graph, which shows the historical average response time (in milliseconds) of portal pages/Gateway Servlet
- Portlet - History graph, which shows the historical average response time (in milliseconds) of portlets
- Model Building - History graph, which shows the historical response time (in milliseconds) of model building
- Page Loading - History graph, which shows the historical response time (in milliseconds) of page loading
- Authentication - History graph, which shows the historical response time (in milliseconds) of authentication
- Authorization - History graph, which shows the historical response time (in Milliseconds) of authorization

Accessing the Portal Summary workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.

4. Within the list of available agents, expand the WebSphere Portal server of your choice.
5. Within that server list of available WebSphere Portal Server workspaces, click the **Portal Summary** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Portlet Summary and Selected Portlet - History workspaces

These workspaces reports performances statistics about WebSphere Portal portlet response times completed on the interval.

Portlet Summary workspace

The Portlet Summary workspace displays only if the request monitoring control level, monitoring level is set to Level2. For more information about the request monitoring control level, see "Application Dashboard (Basic) tab" on page 59.

A historical version of this workspace provides a long-term view of a single portlet that you select. This workspace displays data provided by the Portlet Summary attributes.

The predefined workspace contains the following items:

- Worst Response Times bar chart, which displays the worst average response times (in milliseconds) for portlet in the current interval
- Most Popular Portlets bar chart, which shows the exception and request rates (in events per second) for portlet
- Portlets report, which displays aggregated information about portlets, including average response time, request count and request rate

Accessing the Portlet Summary workspace

To access this workspace from the Portal Summary workspace, use one of the following procedures:

- Within the Navigator, right-click the **Portal Summary** entry; then, from the menu, click **Workspace** > **Portlet Summary**.
- From the primary Tivoli Enterprise Portal menu, click **View** > **Workspace** > **Portlet Summary**.

Selected Portlet - History workspace

The Selected Portlet - History workspace displays the historical information that corresponds to the information in the Portal Summary workspace for a selected portlet. Historical information is collected over a particular measured time span. See the online help for Tivoli Enterprise Portal for a detailed explanation of historical reporting.

Accessing the Selected Portlet - History workspace

To access this workspace from the Portlet Summary workspace, use one of the following procedures:

- From the Portlets report, right-click the link icon and from the menu, click **Selected Portlet - History**.
- From the Worst Response Time bar chart, or the Most Popular Portlets bar chart, right-click any bar; then, from the menu, click **Link To** > **Selected Portlet - History**.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Request Analysis workspace

The workspace reports response times and functional decomposition information about requests (including servlets, JSPs, and EJB methods) that completed during the interval.

A historical version of this workspace provides a long-term view of a single request that you select. This workspace displays data provided by the Request Analysis attributes.

The predefined workspace contains the following items:

- Worst Average Response Times bar chart, which displays the five worst response times for requests processed during the current interval
- Worst Completion Rates bar chart, which displays the 11 requests that have the worst completion rates
- Requests - Current Interval report, which displays detailed information about the response times recorded for each request

Accessing the Request Analysis workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **Request Analysis** entry.

Selected Request - History workspace

The Selected Request - History workspace displays the historical information that corresponds to the information in the Request Analysis workspace for a single request type that you select. Historical information is collected over a specific time span. See the online help for Tivoli Enterprise Portal for a detailed explanation of historical reporting.

Accessing the Selected Request - History workspace

To access this workspace from the Request Analysis workspace, use one of the following procedures:

- From the Requests - Current Interval report, right-click the link icon and from the menu, click **Selected Request - History**.
- From the Worst Average Response Times bar chart, right-click any bar; then, from the menu, click **Link To** > **Selected Request - History**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

The following workspaces are displayed only if the request monitoring control level, monitoring level is set to Level2. For more information about the request monitoring control level, see "Application Dashboard (Basic) tab" on page 59.

- Selected Request - Datasource
- Selected Request - JMS Queues
- Selected Request - Resource Adapters
- Selected Request - Service Components

Accessing the managing server visualization engine from the Request Analysis workspace

Important: To use this functionality, you need ITCAM for Application Diagnostics Managing Server.

In the Tivoli Enterprise Portal access the request analysis workspace, see "Accessing the Request Analysis workspace" on page 107. You can use you can use the following links to access the managing server visualization engine.

- **Diagnostic Recent Completed Requests**
- **Diagnostic In-flight Request Search**
- **Diagnostic SMF Data** (This option is only available if the Tivoli Enterprise Portal is connected to a z/OS data controller.)

For information about access requirements, see "Prerequisites for access" on page 62.

1. In the **Requests - Current Interval** window, right-click the **choose link** icon  then click one of the following options:
   - **Diagnostic Recent Completed Requests**
   - **Diagnostic In-flight Request Search**
2. To view Diagnostic Recent Completed Requests or Diagnostic In-flight Request Search in a z/OS environment, right click the link icon on a row where the ASID column displays Summary.
   a. Click **Selected Request Servant Regions** .
   b. In the **Selected Requests - Servant Regions Current Interval** table, right-click the link icon on a row.
   c. Click **Diagnostic Recent Completed Requests** or **Diagnostic In-flight Request Search**.
3. To view **Diagnostic SMF Data** (z/OS data collector only) right-click the link icon on a row where the ASID column displays Summary.
   a. Click **Selected Request Servant Regions**.
   b. In the **Selected Requests - Servant Regions Current Interval** table, right-click the link icon on a row.
   c. Click **Diagnostic SMF**.

For information about the options available in a z/OS environment, refer to "Region workspaces in a z/OS environment" on page 136 and "Accessing a Region workspace" on page 138

4. If this is your first time to access the managing server visualization agent during the session, you see a **Welcome to the Application Monitor** page.
5. Depending on the user setup configuration in your environment you might have to type your managing server visualization engine **User Name** and **Password**. If you do, you need to log in only once per session using your **User Name** and **Password**.
6. Click **OK** to display the relevant page in the managing server visualization engine.
   - If you click **Diagnostic Recent Completed Requests** you see the **Server Activity Display** page.
   - If you click **Diagnostic In-flight Request Search** you see the **In-Flight Request Search** page.
   - If you click **Diagnostic SMF Data** you see the **SMF Overview** page.
7. The information in these pages relates directly to the context from where you launched the link in the Tivoli Enterprise Portal.
8. To return to the previous workspace in the Tivoli Enterprise Portal interface at any time choose from the following options:
   - From the Tivoli Enterprise Portal desktop client, including WebStart, click the back arrow on the Portal toolbar.
   - From the Tivoli Enterprise Portal browser client, click the browser back arrow.

For additional information, see:

- "Workspace link to managing server visualization engine" on page 61.
- "Access the managing server visualization engine from the Tivoli Enterprise Portal" on page 65

Request Baseline workspace

This workspace displays aggregated information about the request baseline.

The baselining collects statistical information about an application requests completion times and uses this information to assign fair and bad thresholds on the application requests. The product divides the whole request response times into buckets and collects individual hits into each bucket. Use these attributes to get statistics from individual requests collected during baselining interval.

This workspace displays data provided by the Baseline attributes.

The predefined workspace contains:

- Baseline Data report, which shows lower and upper boundaries for each bucket request as well as the breakdown of nested request types in percentage.
- Request Label report, which shows the monitoring configuration settings for selected requests, including auto-threshold settings and actual thresholds calculated from the baseline data.
- Nested Delays Distribution bar chart, which displays a bar for each bucket of response times across the different nested types (JDBC, JCA, JMS, and so on). This chart provides you with additional hints and insight about how to interpret response times distribution displayed in the distribution chart.

- Response Time Distribution bar chart, which displays the distribution of the servlet response times on the baselining interval, also called zones.

You can use the bar charts to customize automatic request time thresholds. See "Enable_Auto_Threshold: set threshold parameters" on page 290.

Accessing the Request Baseline workspace

Complete the following steps to access this workspace: :

1. Access the "Application Configuration workspace" on page 111.
2. In the Application Requests table, right-click the link icon and click **Request Baseline**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

EJB Tier Analysis workspace

The workspace displays detailed information about application tier health for a selected WebSphere application.

The application tier health is derived from the following performance statistics:

- Calculated application request delays in EJB container or custom requests delays compared against corresponding thresholds assigned in application configuration.
- Completion rates for application edge EJB requests.
- Application server ORB thread pool utilization level.
- PMI statistics for application EJB container transactions begin, commit, and rollback rates.

This workspace displays data provided by the Application Health Status attributes.

The predefined workspace contains:

- Application Tier Analysis report, which shows the overall health status of the Application tier for a selected application. For Tivoli Enterprise Monitoring Agent running on z/OS, region ID can be found in the ASID column.
- Container Pool Usage bar chart, which displays the average number of concurrently active threads and the average number of free threads in the pool. This view displays data provided by the Thread Pools attributes.
- Worst Application Tier Delays bar chart, which displays the top 10 delayed requests in the application tier. This view displays data provided by the Request Analysis attributes.
- Worst Application Tier Completion Rates bar chart, which displays the top 10 worst requests in the application tier. This view displays data provided by the Request Analysis attributes.
- Container Transactions - Rates bar chart, which displays the counts of global and local transactions that were started, committed, and undone during the interval. This view displays data provided by the Container Transactions attributes.
- JVM Health - CPU Used % graph, which displays the percentage of the CPU used by the Java Virtual Machine (JVM) during the interval. This view displays data provided by the application server attributes.

- JVM Health - Heap Used % graph, which displays the current heap usage for the monitored JVM. This view displays data provided by the Garbage Collection Analysis attributes.
- JVM Health - GC Active Time % graph, which displays the percentage of real time that the garbage collector was active during the interval. This view displays data provided by the Garbage Collection Analysis attributes.

Accessing the EJB Tier Analysis workspace

To access this workspace from the Application Health Summary workspace, use the following procedures:

- From the Application Health Summary report, right-click the link icon and, from the menu, click **Selected Application - EJB Tier Analysis**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Application Configuration workspace

This workspace displays the information about the configuration details of the selected application.

The workspace contains information about application requests and the corresponding thresholds assigned to them, as well as about status and configuration for application baselining activity. An entry is created for each application in the configuration report when a WebSphere application is discovered by the monitoring agent. The data is also stored in a context file local to monitoring agent where it can persist between monitoring agent restarts.

This workspace displays data provided by the Application Monitoring Configuration attributes.

The predefined workspace contains:

- Longest Request Thresholds - Top 10 bar chart, which displays the 10 longest (in time) request thresholds configured for the given application (Servlet/JSP URL or EJB class/method call).
- Application Requests report, which shows the discovered application requests and thresholds assigned to them. Click the link in the Application Request Configuration report or right-click and select Selected Request - Baseline to go to the Request Baseline Workspace. The link to the Selected Request - Baseline is disabled when the baseline request count is less than or equal to 0.
- Application report, which shows the common details about application configuration, including custom requests monitoring levels for application and current baselining status.

Accessing the Application Configuration workspace

To access this workspace from the Application Health Summary workspace, use the following procedures:

- From the Application Health Summary report, right-click the link icon and from the menu, click **Application Configuration**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Backend Tier Analysis workspace

This workspace displays information about the details of the backend tier for a selected application.

This workspace displays data provided by the Application Health Status attributes.

The predefined workspace contains:

- Backend Tier Analysis report, which shows the overall health status of the backend tier for a selected application. For Tivoli Enterprise Monitoring Agent running on z/OS, region ID can be found in the ASID column.
- Worst Backend Tier Delays bar chart, which displays the top 10 delayed requests in the backend tier. This view displays data provided by the Request Analysis attributes.
- Most Used JDBC resources bar chart, which displays the average time per request used by queries and updates to the data source. This view displays data provided by the Datasources attributes.
- Most Used JMS Resources bar chart, which displays the longest times your application spent in getting messages from a queue, putting messages onto a queue, publishing messages to a queue, or browsing messages on a queue during the interval. This view displays data provided by the JMS Summary attributes.
- Most Used JDBC Pools bar chart, which displays the average percentage of the connection pool in use during the interval. This view displays data provided by the DB Connection Pools attributes.
- Most Used JCA Pools bar chart, which displays the average percent of the pool that is in use for the interval. This view displays data provided by the J2C Connection Pools attributes.
- JVM Health - CPU Used % graph, which displays the percentage of the CPU used by the Java Virtual Machine (JVM) during the interval. This view displays data provided by the application server attributes.
- JVM Health - Heap Used % graph, which displays the current heap usage for the monitored JVM. This view displays data provided by the Garbage Collection Analysis attributes.
- JVM Health - GC Active Time % graph, which displays the percentage of real time that the garbage collector was active during the interval. This view displays data provided by the Garbage Collection Analysis attributes.

Accessing the Backend Tier Analysis workspace

To access this workspace from the Application Health Summary workspace, use the following procedures:

- From the Application Health Summary report, right-click the link icon and from the pop-up menu, click **Backend Tier Analysis**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Application Health History workspace

The workspace displays the information about the historical health status of a selected application. By default, the history data is collected for the last 24 hours.

The workspace displays data provided by the Application Health Status attributes.

The predefined workspace contains:

- Availability/Throughput - History graph, which displays average request processing rate by application over the time. This view displays data provided by the Request Times and Rates attributes.
- Availability/Completion Rate - History graph, which displays the average request completion rate by application over the time; Completion rate is defined as ratio of successfully completed requests count to the total count of requests processed by application on the interval. This view displays data provided by the Request Times and Rates attributes.
- Availability/Average Load- History graph, which displays the average number of concurrent application requests over the time. This view displays data provided by the Request Times and Rates attributes.
- Response Time - History graph, which displays the average application response time over the time. This view displays data provided by the Request Times and Rates attributes.
- Server Resources/CPU Used - History graph, which displays the percent of CPU time used by the application JVM process over the time. This view displays data provided by the application server attributes.
- Server Resources/Paging Rate - History graph, which displays the system paging rate in kilobytes per second over the time. This view displays data provided by the application server attributes.
- Server Resources/GC Active Time - History graph, which displays the percentage of total CPU time for which the garbage collector was active over the time. This view displays data provided by the Garbage Collection Analysis attributes.

Accessing the Application Health History workspace

Complete the following steps to access this workspace from the Application Health Summary:

1. Click **Application Health Summary report**.
2. Right-click the link icon to display the pop-up menu.
3. Click **Application Health history**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Web Tier Analysis workspace

This workspace displays detailed information about the client tier health for a selected WebSphere application.

The client tier health indicator is derived from the following performance statistics:

- Calculated application request delays inside Servlet/JSP or Portal container compared against corresponding thresholds assigned in application configuration.

- Completion rates for edge Servlet/JSP and Portal application requests.
- Application server WebContainer thread pool utilization level.
- PMI statistics for HTTP session counts by application.

This workspace displays data provided by the Application Health Status attributes.

The predefined workspace contains:

- Web Tier Analysis report, which shows the overall health status of application execution in web or portal containers. For Tivoli Enterprise Monitoring Agent running on z/OS, region ID can be found in the ASID column.
- Web Contain bar chart, which displays the current utilization level of the web Container thread pool. This view displays data provided by the Thread Pools attributes.
- HTTP Sessions - Average bar chart, which displays the average number of concurrently active and live HTTP session numbers for the selected application during the interval. This view displays data provided by the Servlet Sessions attributes.
- Worst Web Tier Delays bar chart, which displays the top 10 requests with biggest delays (threshold violations) in the client tier. This view displays data provided by the Request Analysis attributes.
- Worst Web Tier Completion Rates bar chart, which displays the top 10 Servlet/JSP/Portal edge requests with the worst completion rates. This view displays data provided by the Request Analysis attributes.
- JVM Health - CPU Used % graph, which displays the percentage of the host CPU used by the Java Virtual Machine (JVM) during the interval. This view displays data provided by the application server attributes.
- JVM Health - Heap Used % graph, which displays the current heap usage for the monitored JVM. This view displays data provided by the Garbage Collection Analysis attributes.
- JVM Health - GC Time % graph, which displays the percentage of real time that the garbage collector was active during the interval. This view displays data provided by the Garbage Collection Analysis attributes.

Accessing the Web Tier Analysis workspace

Complete the following steps to access this workspace from the Application Health Summary:

1. Click **Application Health Summary report**.
2. Right-click the link icon and from the menu click **Web Tier Analysis**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Datasources - Datasource Trend workspace

The Datasources Trend workspace displays information about datasource connections.

This workspace displays data provided by the Datasources attributes.

The predefined workspace contains the following items:

- Current Datasources report displays datasource name, total wait time, connection rate, connection average wait time and connection max wait time.
- Total Wait Time Trend line chart displays the total time that applications had to wait for a connection to the data source.
- Connection Rate Trend bar chart displays the number of connection requests (per second) created for the data source.
- Connection Average and Max Time Trend line chart displays the average time (in milliseconds) and the worst-case time (in milliseconds) that applications had to wait for a connection.

Selected Request - Datasources workspace

The Selected Request - Datasources workspace displays information about JDBC activity performed by the request you selected in the primary Request Analysis workspace.

This workspace displays data provided by the Selected Request attributes.

The predefined workspace contains the following items:

- Worst Datasources Response Times bar chart, which shows the worst response times (in milliseconds) for data sources accessed by this request
- Selected Request - Datasources report, which displays detailed information about the data sources accessed for the selected request. For Tivoli Enterprise Monitoring Agent running on z/OS, region ID can be found in the ASID column.

Accessing the Selected Request - Datasources workspace

To access this workspace from the Request Analysis workspace, use one of the following procedures:

- From the Requests - Current Interval report, right-click the link icon and from the menu, click **Selected Request - Datasources**.
- From Worst Average Response Times bar chart, right-click any bar; then, from the menu, click **Link To** > **Selected Request - Datasources**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Request - JMS Queues workspace

The Selected Request - JMS Queues workspace displays information about message queues owned by messaging middleware and accessed by the request that you selected in the primary Request Analysis workspace.

This workspace displays data provided by the Selected Request attributes.

The predefined workspace contains the following items:

- Worst JMS Queues Response Times bar chart, which shows the worst response times (in milliseconds) for JMS resources accessed by this request
- Selected Request - JMS Queues report, which displays detailed information about the JMS resources accessed by the selected request. For Tivoli Enterprise Monitoring Agent running on z/OS, region ID can be found in the ASID column.

Accessing the Selected Request - JMS Queues workspace

To access this workspace from the Request Analysis workspace, use one of the following procedures:

- From the Requests - Current Interval report, right-click the link icon and from the menu, click **Selected Request - JMS Queues**.
- From Worst Average Response Times bar chart, right-click any bar; then, from the menu, click **Link To** > **Selected Request - JMS Queues**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Request - Portal Processing workspace

The Selected Request - Portal Processing workspace displays information about portlet, or portal page response times, or both, referenced by the request you selected in the primary Request Analysis workspace.

This workspace displays data provided by the Selected Request attributes.

Note: This workspace appears under all WebSphere application servers, but it has data only under the WebSphere Portal Server.

The predefined workspace contains the following items:

- Worst Portal Processing Response Times bar chart, which shows the worst response times (in milliseconds) for portal sources accessed by this request
- Selected Request - Portal Processing report, which displays detailed information about the portal sources accessed for the selected request. For Tivoli Enterprise Monitoring Agent running on z/OS, region ID can be found in the ASID column.

Accessing the Selected Request - Portal Processing workspace

To access this workspace from the Request Analysis workspace, use one of the following procedures:

- From the Requests - Current Interval report, right-click the link and from the menu, click **Selected Request - Portal Processing**.
- From Worst Average Response Times bar chart, right-click any bar; then, from the menu, click **Link To** > **Selected Request - Portal Processing**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Request - Resource Adapters workspace

The Selected Request - Resource Adapters workspace displays response-time information about the J2C resources adapters referenced by the request you selected in the primary Request Analysis workspace.

This workspace displays data provided by the Selected Request attributes.

The predefined workspace contains the following items:

- Worst Average Response Times bar chart, which shows the worst-performing J2C resource adapter nested requests, in milliseconds
- Selected Request - Resource Adapters report, which displays detailed information about each J2C resource adapter that was accessed by the selected request. For Tivoli Enterprise Monitoring Agent running on z/OS, region ID can be found in the ASID column.

Accessing the Selected Request - Resource Adapters workspace

To access this workspace from the Request Analysis workspace, use one of the following procedures:

- From the Requests - Current Interval report, right-click the link icon and from the menu, click **Selected Request - Resource Adapters**.
- From Worst Average Response Times bar chart, right-click any bar; then, from the menu, click **Link To** > **Selected Request - Resource Adapters**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Request - Service Components workspace

The Selected Request - Service Components workspace displays information about Service Component Architecture (SCA) activity performed by the request you selected in the primary Request Analysis workspace.

This workspace displays data provided by the Selected Request attributes.

The predefined workspace contains the following items:

- Worst Service Components Response Times bar chart, which shows the worst response times (in milliseconds) for data sources accessed by this request
- Selected Request - Service Components report, which displays detailed information about the data sources accessed for the selected request. For Tivoli Enterprise Monitoring Agent running on z/OS, region ID can be found in the ASID column.

Accessing the Selected Request - Service Components workspace

To access this workspace from the Request Analysis workspace, use one of the following procedures:

- From the Requests - Current Interval report, right-click the link icon and from the menu, click **Selected Request - Service Components**.
- From Worst Average Response Times bar chart, right-click any bar; then, from the menu, click **Link To** > **Selected Request - Service Components**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Service Component Elements workspace

This workspace lists performance metrics for all the service components and their elements. Service components contain one or more elements, which are sets of

different steps processed in each service component. In turn, each element has its own set of event natures, which are key points that are reached when processing a service component element.

This workspace displays data provided by the Service Component Elements attributes.

Note:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Worst Service Times bar chart, which shows the numbers of the Average Response Time in milliseconds
- Most Invocations bar chart, which shows the numbers of the invocations per second
- Most Failures bar chart, which shows the numbers of the failed invocation counts
- Service Component Elements report, which shows aggregated data about the average response time, failed count, success count, error rate, and request rate.

Accessing the Service Component Elements workspace

To access this workspace from the Service Components workspace, use one of the following procedures:

- Within the Navigator, right-click the **Service Components** entry; then, from the menu, click **Workspace** > **Service Component Elements**.
- From the primary Tivoli Enterprise Portal menu, click **View** > **Workspace** > **Service Component Elements**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Request - History workspace

The Selected Request - History workspace displays information about historical request instances for the named request you selected in the primary Request Analysis workspace.

This workspace displays data provided by the Selected Request attributes.

The predefined workspace contains the following items:

- Selected Request Response Times - History bar chart, which shows the average response times (in milliseconds) spent within various request types in instances of this named request.
- Selected Request - History sources report, which displays detailed information about historical request instances for the selected request.

Click the  icon to select a time span. The item displays the data for the selected time span.

Accessing the Selected Request - data sources workspace

To access this workspace from the Request Analysis workspace, use one of the following procedures:

- From the Requests - Current Interval report, right-click the link icon and select **Selected Request - History**.
- From Worst Average Response Times bar chart, right-click any bar and select **Link To > Selected Request - History**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Service Components workspace

This workspace provides overview performance of the key service components. WebSphere servers feature their own service components, and each of these components has its own set of event points that can be monitored.

This workspace displays data provided by both the Service Components attributes. This workspace is available only for WebSphere Process Server and WebSphere ESB Server.

Note:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Service Component Architecture - History graph, which shows historical bad request count, the instrumentation level, set instrumentation level type, and summary, when the component name of the service is Service Component Architecture
- Business Rules - History graph, which shows historical bad request count, the instrumentation level, set instrumentation level type, and summary, when the name is Business Rules

- Map - History graph, which shows historical bad request count, the instrumentation level, set instrumentation level type, and summary, when the name is Map
- Mediation - History graph, which shows historical bad request count, the instrumentation level, set instrumentation level type, and summary, when the name is Mediation
- Business State Machine - History graph, which shows historical bad request count, the instrumentation level, set instrumentation level type, and summary, when the name is Business State Machine
- Selector - History graph, which shows historical bad request count, the instrumentation level, set instrumentation level type, and summary, when the name is Selector
- Bad Requests report, which displays a summary of the bad request counts

Accessing the Service Components workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **Service Components** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Servlets/JSPs - Selected Web Application workspace

This workspace displays statistical data regarding the servlets and JSPs invoked by a single Web application.

This workspace displays data provided by the Servlets JSPs attributes.

Note:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Worst Servlet/JSP Response Times bar chart, which displays the worst average response times (in milliseconds) for servlets and JSP invoked by the selected web application
- Most Popular Servlet/JSP bar chart, which shows the servlet and JSP exception and request rates (in events per second) for the selected application
- Worst Servlet/JSP Error Rates bar chart, which shows the worst servlet and JSP error rates for the selected application during the interval
- Servlets/JSPs - Selected Web Application report, which displays performance information about the servlets and JSPs invoked by the application. For example, this report displays the average number of concurrent requests for a servlet and the amount of time it takes a servlet to respond to a request

Accessing the Servlets/JSPs - Selected Web Application workspace

To access this workspace from the Web Applications workspace, use one of the following procedures:

- From the Web Applications report, right-click the link icon and from the menu, click **Servlets/JSPs - Selected Web Application**.
- From the Worst Response Times bar chart, the Most Popular Web Applications bar chart, or the Worst Error Rates bar chart, right-click any bar; then, from the menu, click **Link To** > **Servlets/JSPs - Selected Enterprise Application**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Scheduler workspace

The Scheduler workspace contains data for the Scheduler service. The scheduler service schedules and tracks the starting and stopping of applications.

This workspace displays data provided by the Scheduler attributes.

Note:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Highest Task Failures bar chart, which shows the number of the task failure count. The y-axis headings correspond to the row number of the Scheduler report
- Highest Completed Tasks bar chart, which shows the number of the task finished count. The y-axis headings correspond to the row number of the Scheduler report

- Schedulers report, which displays information about the scheduler data, including task finish count, task failure count, task expiration rate, task finish rate, and task run rate

Accessing the Scheduler workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **Scheduler** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Sessions workspace

This workspace displays information about servlet sessions.

A session is a series of requests to a servlet, originating from the same user at the same browser. Applications running in a web container can use these sessions to track individual users. This workspace displays data provided by the Servlet Sessions attributes.

Note:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Most Active Sessions bar chart, which shows the most frequently referenced servlet sessions for each listed web application
- Largest Total Session Object Sizes bar chart, which shows the total session object sizes (in bytes) and the associated web applications
- Servlet Sessions report, which shows usage data about the servlet sessions, including the rates as which sessions are created and destroyed and their read and write times

Accessing the Sessions workspace

To access this workspace from the Web Applications workspace, use one of the following procedures:

- Within the Navigator, right-click the **Web Applications** entry; then, from the menu, click **Workspace** > **Servlet Sessions**.
- From the primary Tivoli Enterprise Portal menu, click **View** > **Workspace** > **Servlet Sessions**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Thread Pools workspace

This workspace reports information about the various thread pools that support the applications running in your Java Virtual Machine (JVM).

This workspace displays data provided by the Thread Pools attributes.

Note:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Highest Average Pool Sizes bar chart, which shows the largest thread pools in the JVM
- Average Thread Pool Usage bar chart, which shows the average active and free threads for each thread pool
- Thread Pools report, which shows information about the usage statistics for thread pools that belong to a WebSphere application server, such as average and maximum pool sizes and creation and destruction rates

Accessing the Thread Pools workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.

5. Within that server list of available WebSphere application server workspaces, click the **Thread Pools** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Accessing the managing server visualization engine from the Thread Pools workspace

Important: To use this functionality, you need ITCAM for Application Diagnostics Managing Server.

In The Tivoli Enterprise Portal access the Thread Pools workspace. You can use the **Diagnostic Server Activity Display** link to access the managing server visualization engine. For information about access requirements see "Prerequisites for access" on page 62.

1. In the **Thread Pools** window, right-click the **choose link** icon  then click **Diagnostic JVM Thread Display**.
2. If this is your first time to access the managing server visualization agent during a session, you see a **Welcome to the Application Monitor** page.
3. Depending on the user setup configuration in your environment you might have to type your managing server visualization engine **User Name** and **Password**. If you do, you need only to log in using your **User Name** and **Password** once per session.
4. Click **OK** to display the **Diagnostic JVM Thread Display** page in the managing server Visualization engine. You can use link to diagnose application problems, for example, slow transactions or high response times.
5. The results relate directly to the context from where you launched the link in the Tivoli Enterprise Portal. For more information about using the **Diagnostic JVM Thread Display** page and additional features, refer to the Composite Application Manager help within the managing server visualization engine Interface.
6. To return to the previous workspace in the Tivoli Enterprise Portal interface at any time choose from the following options:
   - From the Tivoli Enterprise Portal desktop client, including WebStart, click the back arrow on the Portal toolbar.
   - From the Tivoli Enterprise Portal browser client, click the browser back arrow.

For additional information, see:

- "Workspace link to managing server visualization engine" on page 61
- "Access the managing server visualization engine from the Tivoli Enterprise Portal" on page 65

Thread Pool Trend workspace

The Thread Pool Trend workspace displays information about thread pool size and usage.

This workspace displays data provided by the Selected Request attributes.

This predefined workspace contains the following items:

- Current Thread Pool report displays thread pool name, average active threads, average pool size, percentage of time pool at max and average free threads.
- Average Pool Size Trend bar chart displays the average number of threads in the pool.
- Average Thread Pool Usage Trend bar chart displays the average percentage of time that all threads were in use during the sampling interval.
- Percent of Time Pool Size at Max Trend bar chart displays the percentage of time the pool size is running at the maximum value.

Accessing the Threadpool Trend workspace

Select the **Thread Pools** workspace, in the **Thread Pools** report, click the link icon, and select **Thread Pool Trend**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Web Applications workspace

This workspace displays information about the web applications running in JEE application servers.

This workspace displays data provided by the Web Applications attributes.

Note:

- The **Web Applications** workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- Worse Response Times bar chart, which shows the worst servlet response times (in milliseconds) during the interval
- Most Popular Web Applications bar chart, which shows the servlet exception and request rates (in events per second)
- Worse Error Rates bar chart, which shows the worst servlet error rates during the interval
- Web Applications report, which displays aggregated performance data for each web application, about all servlets and JSPs deployed to that web application, including response and error rates, and response times.

Accessing the Web Applications workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **Web Applications** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Accessing the managing server visualization engine from the Web Applications workspace

Important: To use this functionality, you need ITCAM for Application Diagnostics Managing Server.

In the Tivoli Enterprise Portal access the **WebSphere Agent** workspace. You can use the **Diagnostic Server Activity Display** link to access the managing server visualization engine. For information about access requirements, see "Prerequisites for access" on page 62.

1. In the **Web Applications** window, right-click the **choose link** icon  then click **Diagnostic Server Activity Display**.
2. If this is your first time to access the managing server visualization agent during a session, you see a **Welcome to the Application Monitor** page.
3. Depending on the user setup configuration in your environment you might have to type your managing server visualization engine **User Name** and **Password**. If you do, you need to log in only once per session using your **User Name** and **Password**.
4. Click **OK** to display the **Server Activity Display** page in the managing server Visualization engine. You can use link to diagnose application problems, for example, slow transactions or high response times.
5. The results in this page relate directly to the context from where you launched the link in the Tivoli Enterprise Portal. For more information about using the **Server Activity Display** page and additional features, refer to the Composite Application Manager help within the managing server visualization agent Interface.
6. To return to the previous workspace in the Tivoli Enterprise Portal interface at any time choose from the following options:
   - From the Tivoli Enterprise Portal desktop client, including WebStart, click the back arrow on the Portal toolbar.
   - From the Tivoli Enterprise Portal browser client, click the browser back arrow.

For additional information, see:

- "Workspace link to managing server visualization engine" on page 61

- "Access the managing server visualization engine from the Tivoli Enterprise Portal" on page 65

Web Services workspace

The Web Services workspace displays information about the data counters of the web services.

The examples of the information include the number of loaded web services, the number of requests delivered and processed, the request response time, and the average size of requests. This workspace displays data provided by both the Web Services attributes and the Web Services Gateway attributes.

Note:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains:

- Worst Response Times bar chart, which displays the worst average response times (in milliseconds) for the selected web services
- Most Popular bar chart, which shows the exception and request rates (in events per second) for the selected services
- Web Services report, which displays aggregated performance data for each web service, including requests, response times, and payload sizes
- Web Service Gateway report, which displays aggregated performance data for each Web service gateway, including the number of synchronous and asynchronous requests and responses

Accessing the Web Services workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **Web Services** entry.

Selected Web Services - History workspace

The Selected Web Services - History workspace displays the historical information that corresponds to the information in the Web Services workspace for a selected web service. Historical information is collected over a particular measured time span. See the online help for Tivoli Enterprise Portal for a detailed explanation of historical reporting.

Accessing the Selected Web Services - History workspace

To access this workspace from the Web Services workspace, use one of the following procedures:

- From the Web Services report, right-click the link icon and from the menu, click **Selected Web Services - History**.
- From the Worst Response Times bar chart, or the Most Popular bar chart, right-click any bar; then, from the menu, click **Link To** > **Selected Web Services - History**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

WebSphere Agent workspace

This workspace displays product events that affect the ability of the WebSphere application server agent to collect data.

This workspace displays events occurring within the WebSphere application server agent and WebSphere application servers that are installed on the host computer. It also displays the status of the Tivoli Enterprise Monitoring Agent. The predefined workspace contains the following items:

- Agent Events report, which displays information about agent-level events that affect the ability of the Tivoli Enterprise Monitoring Agent to collect data for the WebSphere application server. You can use this view to see exception and error messages, their IDs, and their severity.

  The Agent Events report also shows the result of issuing a Take Action command. Place your cursor over a truncated message to display the text of the complete message

  This report displays data reported by the WebSphere Agent Events attributes.
- Application Servers Summary report displays information about status of the WebSphere server.

  This report displays data reported by the application server Status attributes.

Accessing the WebSphere Agent workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.

3. Within that node list of available Tivoli Enterprise Monitoring Agents, if the **WebSphere Agent** entry has a name next to it (for example, **WebSphere Agent - Primary**), click the entry. Otherwise, expand the entry and click one of the agent names.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Accessing the managing server visualization engine from the WebSphere Agent workspace

Important: To use this functionality, you need ITCAM for Application Diagnostics Managing Server.

In the Tivoli Enterprise Portal access the WebSphere agent workspace. You can use the **Diagnostic Server Activity Display** or the **Diagnostic In-flight Request Search** link to access the managing server visualization engine. For information about access requirements, see "Prerequisites for access" on page 62.

1. In the **Applications Server Summary** window, right-click the **choose link** icon  then click **Diagnostic Server Activity Display** or **Diagnostic In-flight Request Search**.
2. If this is your first time to access the managing server visualization agent, during the session you see a **Welcome to the Application Monitor** page.
3. Depending on the user setup configuration in your environment, you might have to type your managing server visualization engine **User Name** and **Password**. If you do, you need to log in only once per session using your **User Name** and **Password**.
4. Click **OK** to display the relevant page in the managing server Visualization engine.
   - If you click **Diagnostic In-flight Request Search** you see the **In-Flight Request Search** page in managing server visualization engine.
   - If you click **Diagnostic Server Activity Display** you see the **Server Activity Display** page in the managing server visualization engine.
5. The information in both of these pages relates directly to the context from where you launched the link in the Tivoli Enterprise Portal.
6. To return to the previous workspace in the Tivoli Enterprise Portal interface at any time choose from the following options:
   - From the Tivoli Enterprise Portal desktop client, including WebStart, click the back arrow on the Portal toolbar.
   - From the Tivoli Enterprise Portal browser client, click the browser back arrow.

For additional information, see:

- "Workspace link to managing server visualization engine" on page 61
- "Access the managing server visualization engine from the Tivoli Enterprise Portal" on page 65

WebSphere application server workspace

The WebSphere application server workspace displays overall statistics for each application server being monitored by the Tivoli Enterprise Monitoring Agent.

The predefined workspace contains the following items:

- Heap Usage - History bar chart, which displays free memory size and used memory size (in kilobytes) within the WebSphere application server heap over time. The chart flyovers display the exact values

  This view displays data provided by the Garbage Collection Analysis attributes.
- Response Time - History graph, which shows the server response time to requests over time

  This view displays data provided by the Request Times and Rates attributes.
- Request Rate - History graph, which shows the rate at which requests have been received by this server over time

  This view displays data provided by the Request Times and Rates attributes.
- Percent CPU Used - History graph, which shows the percentage of the CPU that this server used over time

  This view displays data provided by the application server attributes.
- Application server Summary report, which displays overall information about this WebSphere application server, including JVM statistics and CPU usage statistics

  This view displays data provided by the application server attributes. In the application server summary report, each row represents a different region. When you right-click the link for a row, you can choose to go to Selected Region - application server Summary, Selected Region - Request Analysis, Selected Region - Application Health Status, Selected Region - Datasources, Selected Region - Log Analysis or Selected Region - JMS Summary. All these links are disabled when Tivoli Enterprise Monitoring Agent is running on Distributed data collector and enabled when Tivoli Enterprise Monitoring Agent is running on z/OS data collector.

Accessing the WebSphere application server workspace

Complete the following steps to access this workspace:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, click the **WebSphere App Server** entry of your choice.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

WebSphere ESB Server workspace

The WebSphere ESB Server workspace displays overall statistics for each application server being monitored by the Tivoli Enterprise Monitoring Agent.

The predefined workspace contains the following items:

- Heap Usage - History bar chart, which displays free memory size and used memory size (in kilo bytes) within the WebSphere application server heap over time. The chart flyovers display the exact values

This view displays data provided by the Garbage Collection Analysis attributes.

- Response Time - History graph, which shows the server response time to requests over time

  This view displays data provided by the Request Times and Rates attributes.
- Request Rate - History graph, which shows the rate at which requests have been received by this server over time

  This view displays data provided by the Request Times and Rates attributes.
- Percent CPU Used - History graph, which shows the percentage of the CPU that this server consumed over time

  This view displays data provided by the application server attributes.
- Application server summary report, which displays overall information about this WebSphere application server, including JVM statistics and CPU usage statistics

  This view displays data provided by the application server attributes.

Accessing the WebSphere ESB Server workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, click the **WebSphere ESB Server** entry of your choice.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

WebSphere Portal Server workspace

The WebSphere Portal Server workspace displays overall statistics for each application server being monitored by the Tivoli Enterprise Monitoring Agent.

The predefined workspace contains the following items:

- Heap Usage - History bar chart, which displays free memory size and used memory size (in kilo bytes) within the WebSphere application server heap over time. The chart flyovers display the exact values

  This view displays data provided by the Garbage Collection Analysis attributes.
- Response Time - History graph, which shows the server response time to requests over time

  This view displays data provided by the Request Times and Rates attributes.
- Request Rate - History graph, which shows the rate at which requests have been received by this server over time

  This view displays data provided by the Request Times and Rates attributes.
- Percent CPU Used - History graph, which shows the percentage of the CPU that this server consumed over time

  This view displays data provided by the application server attributes.

- Application server summary report, which displays overall information about this WebSphere application server, including JVM statistics and CPU usage statistics

  This view displays data provided by the application server attributes. In the application server summary report, each row represents a different region. When you right-click the link for a row, you can choose to go to Selected Region - application server Summary, Selected Region - Request Analysis, Selected Region - Application Health Status, Selected Region - Datasources, Selected Region - Log Analysis, Selected Region - JMS Summary, Selected Region - Portal Summary, Selected Region - Portlet Summary. All these links are disabled when Tivoli Enterprise Monitoring Agent is running on Distributed data collector and enabled when Tivoli Enterprise Monitoring Agent is running on z/OS data collector.

Accessing the WebSphere Portal Server workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, click the **WebSphere Portal Server** entry of your choice.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

WMQ Client Link Communications workspace

This workspace provides aggregated counter statistics for all of the clients of WMQ Queue Managers that are or have been connected to this application server. WebSphere application server 5.1 based products do not support this workspace.

This workspace displays data provided by the WMQ Client Link Communications attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- WMQ Client Link Communication Errors - History graph, which shows the number of errors that have caused connections to WMQ JMS clients to be dropped
- WMQ Client Link Statistics report, which displays information about the messaging engine communications, including batch sent, message sent, message received, comm errors, writes blocked, and reads blocked

Accessing the WMQ Client Link Communications workspace

To access this workspace from the Platform Messaging workspace, use one of the following procedures:

- Within the Navigator, right-click the **Platform Messaging** entry; then, from the menu, click **Workspace** > **WMQ Client Link Communications**.
- From the primary Tivoli Enterprise Portal menu, click **View** > **Workspace** > **WMQ Client Link Communications**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

WMQ Link Communications workspace

This workspace provides aggregated counter statistics for all of the WMQ Queue Managers that are or have been connected to this application server. WebSphere application server 5.1 based products do not support this workspace.

This workspace displays data provided by the WMQ Link Communications attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- WMQ Link Communication Errors - History graph, which shows the historical number of communication errors that resulted in the disconnection of a network connection to a WMQ Queue Manager
- WMQ Link Statistics report, which displays information about the messaging engine communications, including batches sent, batches received, message sent, message received, and comm errors

Accessing the WMQ Link Communications workspace

To access this workspace from the Platform Messaging workspace, use one of the following procedures:

- Within the Navigator, right-click the **Platform Messaging** entry; then, from the menu, click **Workspace** > **WMQ Link Communications**.
- From the primary Tivoli Enterprise Portal menu, click **View** > **Workspace** > **WMQ Link Communications**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Workload Management workspace

This workspace displays information about the Workload Management (WLM) server and about the WLM client that initiates workload requests to that server.

Workload management optimizes the distribution of client processing tasks. Incoming work requests are distributed to the application servers, enterprise beans, servlets, and other objects that can most effectively process the requests. Workload management also provides failover protection when servers are not available, improving application availability. In a WebSphere application server environment, you implement workload management using clusters, transports, and replication domains.

This workspace displays data provided by both the Workload Management Server attributes and the Workload Management Client attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

The predefined workspace contains the following items:

- WLM Server Incoming Requests bar chart, which shows the incoming strong affinity requests and the incoming nonaffinity requests (per second)
- WLM Client Outgoing Requests bar chart, which shows the outgoing requests (per second)
- Workload Management Server report, which shows detailed information about the WLM server, such as incoming requests and clients served
- Workload Management Client report, which shows information about the clients that initiate workload requests, such as outgoing requests and response times

Accessing the Workload Management workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.

2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.
4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **Workload Management** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Workplace Mail workspace

This workspace provides aggregated statistics of the usage information about the incoming message traffic.

This workspace displays data provided by the Workplace Mail Service attributes.

Important:

- This workspace reports blanks for resource data on the first invocation if PMI data collection is configured for on-demand sampling (that is, if your site set configuration value Resource Data Collection Method to On Demand) or if you have not yet run applications that generate PMI resource data. To report resource data in this workspace after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- Because of high processor usage, the Tivoli Enterprise Monitoring Agent provides on-demand sampling by default. To activate PMI monitoring, you must first select this workspace and then select it again later. Each time you select the workspace, it displays the data collected during the interval between selections.

Important: This workspace does not support linking to ITCAM for Application Diagnostics Managing Server visualization engine.

The predefined workspace contains the following items:

- Connections bar chart, which displays the number of connections to the SMTP server, SMTP client connections, and the maximum number of concurrent LDAP connections during the sampling interval
- Workplace Mail report, which displays detailed information about the workplace mail connections

Accessing the Workplace Mail workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to the node that you want to select.
3. Within that node list of monitored applications, expand the list of WebSphere agents.

4. Within the list of available agents, expand the WebSphere application server of your choice.
5. Within that server list of available WebSphere application server workspaces, click the **Workplace Mail** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Region workspaces in a z/OS environment

For z/OS installations, workspace tables report data at both a region and server instance level.

Important: ITCAM Agent for WebSphere Applications on z/OS is available in separate product packages.

Note: ITCAM Agent for WebSphere Applications 7.2 is not available on z/OS The advantage is that you can view metrics collected at both levels and switch between server instance level and region level. The following table lists the workspaces that show information at both a region and server level.

All workspaces except the Garbage Collection Analysis workspace report data on both levels. The Garbage collection analysis workspace does not have links to the top-level workspaces.

Table 8. Workspaces and the Servant and Selected Regions in a z/OS environment

Workspace Table Name	Link Name	Description
WebSphere App Server - application server Summary	WebSphere App Server - application server Summary - Selected Region - application server Summary Selected Region - Application Health Status Selected Region - Request Analysis Selected Region - Log Analysis Selected Region - Data Sources Selected Region - JMS - Summary	This workspace displays data at regional level. Click the Selected Region links to access region-specific links to other top-level workspaces. When a workspace is linked from the application server summary you can view specific drill-down metrics. To view a report for an individual region, see “Accessing a Region workspace” on page 138

Table 8. Workspaces and the Servant and Selected Regions in a z/OS environment (continued)

Workspace Table Name	Link Name	Description
Application Health - Application Health Summary	Selected Application - Servant regions Selected Application - Health History Selected Application- Web Tier Analysis Selected Application - EJB Tier Analysis Selected Application - Backend Tier Analysis Selected Application - Request Analysis Selected Application - Configuration	In an z/OS environment, the Application Health Summary report displays the total results for the server instances. To view report results by region, click the WebSphere App Server - application server Summary table and right-click a link icon in the table to view the available options.
Request Analysis - Requests Current Interval	Selected Request - Datasource Selected Request - JMS Queues Selected Request - Resource Adaptors Selected Request - History Selected Request - Servant Regions	In an z/OS environment, when you select Request Analysis - Requests Current Interval, this report displays the total results for the server instances. To view a report for an individual Request Analysis region, see "Accessing a Region workspace" on page 138.
Garbage Collection Analysis - Garbage Collection Analysis	Selected Region - History Garbage Collection Analysis - Servant Region (only available when you click a **[Summary]** row)	For Garbage Collection Analysis, there is a summary report of all regions and there are also reports by individual region.
Log Analysis - Log Analysis	Selected Region - Log Analysis	Log Analysis workspace. In a z/OS environment, the log analysis workspace reports data in two ways. When you select the Log analysis workspace the report displays JVM Log Analysis and DC message events from all regions. To view a report for an individual log analysis region, see "Accessing a Region workspace" on page 138.
Data sources - Data sources - Current Interval	Selected Datasource Selected Datasource - History	In an z/OS environment, this report displays the total results for the server instances. To view a report for an individual Data source region, see "Accessing a Region workspace" on page 138.

Table 8. Workspaces and the Servant and Selected Regions in a z/OS environment (continued)

Workspace Table Name	Link Name	Description
JMS Summary - JMS Summary - Current Interval JMS	Selected JMS - Servant Regions	In an z/OS environment, this report displays the total results for the server instances. To view a report for an individual JMS Summary region, see“Accessing a Region workspace.”
WebSphere Portal Server	Selected Region - Portal Server Summary	In an z/OS environment, this report displays the total results for the server instances. To view a report for an individual Portal Server summary, see “Accessing a Region workspace”
Portal Summary	Selected Region - Portal Summary Selected Region - Portlet Summary Selected Portal Page - History Selected Portlet - History Selected Region - Portal Page Summary	In an z/OS environment report displays the total results for the server instances. To view a report for an individual region see “Accessing a Region workspace”

Accessing a Region workspace

To access this workspace, complete the following steps:

1. In the Navigator, expand z/OS system, as appropriate for the node you are monitoring.
2. In the node list, expand the entry that corresponds to the node that you want to select.
3. In that node list of monitored agents, expand the list of the servers.
4. In the list of available servers, click the WebSphere agent of your choice.
5. In the list of available servers, select the Server of your choice.
6. Right-click the selected Server node and select **WebSphere App Server** workspace.
7. Right-click a link icon in the **application server Summary** table to display workspaces connected with the current region.
8. Select the workspace of your choice from the following list:
   - Selected Region application server Summary
   - Selected Region - Application Health Status
   - Selected Region - Request Analysis
   - Selected Region - Log Analysis
   - Selected Region - Data Sources
   - Selected Region - JMS - Summary

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Attributes for ITCAM Agent for WebSphere Applications

IBM Tivoli Composite Application Manager Agent for WebSphere Applications is a Tivoli Enterprise Monitoring Agent that resides within your distributed systems. This agent gathers data about running WebSphere application server processes that have been collected and stored by the ITCAM Data Collector for WebSphere, and stores those data in elements called attributes. Each attribute is a characteristic of an object. For example, the Receive Count attribute in the JMS Summary attribute group counts the number of messages your applications have retrieved from JMS messages queues.

Attribute groups

The IBM Tivoli Composite Application Manager Agent for WebSphere Applications attributes are organized into groups of related items. These attribute groups comprise the attribute tables for this agent. For example, the Garbage Collection Analysis attribute group provides information about the frequency with which the Java Virtual Machine (JVM) invokes its garbage collector.

Attributes and workspaces

Within the Tivoli Enterprise Portal workspaces, these attributes are displayed in, and correspond to, the columns in the reports and the items in the graphic displays for charts and graphs. You can use the collected data to analyze and monitor the performance of your WebSphere application servers and the applications running within them. For an overview of the correlations between the predefined workspaces and the attribute groups, see Attribute Groups Used by the Predefined Workspaces.

Attributes and situations

Various attributes are referenced by the predefined situations of the product. You can also use the IBM Tivoli Composite Application Manager Agent for WebSphere Applications attributes to create your own situations to monitor the performance of your WebSphere application servers and their applications. These situations can monitor your WebSphere application server resources or correlate multiple conditions to alert you to problems that might have occurred when attribute values exceed defined thresholds.

Attribute groups used by the predefined workspaces

A workspace contains graphical data or report columns that correspond directly to particular attributes in an attribute group. The following table shows the correlations between the predefined workspaces and the attribute groups. The primary and secondary workspaces, are listed alphabetically, not in the order in which they appear in the Navigator.

Table 9. Workspaces and the attribute groups they reference

Workspace	Related Attribute Groups
Application Health Summary	Application Health Status
Application Registry	Application Monitoring Configuration
Allocation Failures	Allocation Failure

Table 9. Workspaces and the attribute groups they reference (continued)

Workspace	Related Attribute Groups
Cache Analysis	Dynamic Cache Dynamic Cache Templates
Client Communications	Client Communications
Container Object Pools	Container Object Pools
Container Transactions	Container Transactions
Datasources Selected Datasource - History	Datasources
DB Connection Pools Selected DB Connection Pool - History	DB Connection Pools
DCS Stacks	DCS Stack Counter
Destinations	Topic Spaces Queue
Durable Subscriptions	Durable Subscriptions
EJB Containers	EJB Containers
Enterprise Java Beans	Enterprise Java Beans
Garbage Collections - Selected Allocation Failure	Garbage Collection Cycle
Garbage Collector Analysis	Garbage Collection Analysis
High Availability Manager	High Availability Manager
IMAP/POP	Workplace Mail IMAP/POP
J2C Connection Pools	J2C Connection Pools
JMS Summary	JMS Summary
Log Analysis	Log Analysis
Lotus	application server Request Times and Rates Garbage Collection Analysis
Messages Queues	Workplace Mail Queues
Messaging Engine Communications	Messaging Engine Communications
Platform Messaging	Messaging Engines
Pool Analysis	Thread Pools DB Connection Pools J2C Connection Pools application server
Portal Pages Summary Selected Portal Page - History	Portal Page Summary
Portal Summary	Portal Summary
Portlet Summary Selected Portlet - History	Portlet Summary
Request Analysis Selected Request - History	Request Analysis
Selected Request - Baseline	Baseline
“Selected Request - Service Components workspace” on page 117	Selected Request
Scheduler	Scheduler

Table 9. Workspaces and the attribute groups they reference (continued)

Workspace	Related Attribute Groups
Selected Application - Application Tier Analysis Selected Application - Backend Tier Analysis Selected Application - Health History Selected Application - Client Tier Analysis	Application Health Status
Selected Application - Configuration	Application Monitoring Configuration
Selected Request - Datasources	Selected Request
Selected Request - JMS Queues	Selected Request
Selected Request - Resource Adapters	Selected Request
Servlets/JSPs - Selected Web Application	Servlets JSPs
Sessions	Servlet Sessions
Thread Pools	Thread Pools
Web Applications	Web Applications
Web Services Selected Web Services - History	Web Services Counters Web Services Gateway Counters
WebSphere Agent	WebSphere Agent Events application server Status "Remote Configuration Requests attributes" on page 224
WebSphere App Server	application server Request Times and Rates Garbage Collection Analysis
WebSphere ESB Server	application server Request Times and Rates Garbage Collection Analysis
WebSphere Portal Server	application server Request Times and Rates Garbage Collection Analysis
WebSphere Process Server	application server Request Times and Rates Garbage Collection Analysis
WMQ Client Link Communications	WMQ Client Link Communications
WMQ Link Communications	WMQ Link Communications
Workload Management	Workload Management Client Workload Management Server
Workplace Mail	Workplace Mail Service

Alarm Manager attributes

The **Alarm Manager** attributes provide information for the alarm management. Use these attributes to manage alarms fired by the application for each work manager.

The attributes within this group are used to build the Alarm Manager workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and then select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Alarms Canceled The number of alarms canceled by the application. The valid format is a positive integer.

Alarms Created The total number of alarms created by all asynchronous scopes for the current Work Manager. The valid format is a positive integer.

Alarms Fired The number of alarms fired. The valid format is a decimal (formatted to three decimal places).

Alarms Latency Duration The latency of alarms fired in milliseconds. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Alarms Pending Size The number of alarms waiting to fire. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Alarms Rate The number of alarms firing per second. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Instrumentation Level For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Row Number The row number. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 10. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Whether this row is a summary row of statistical totals for all rows. Valid values are No and Yes.

Work Manager Name The name of the work manager. The value format is an alphanumeric string, with a maximum of 256 characters.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Allocation Failure attributes

The **Allocation Failure** attribute group provides information about the heap-allocation failure that caused the Java Virtual Machine hosting the application server to start its garbage-collection routine.

You can use the Allocation Failure attributes in situations to determine the events that caused the JVM to start garbage collection. The attributes within this group are used to build the Allocation Failures workspace.

Allocation Failure Number The identifier assigned to the current allocation-failure block, which is associated with a bar in the Heap Usage - History bar chart. The valid format is a positive integer.

ASID The identifier (decimal) assigned to the address space running this servant region.

Bytes Needed The number of bytes needed on the heap when this allocation failure occurred. The valid format is a positive integer.

GC Cycle Count The number of garbage-collection cycles caused by this allocation failure. The valid format is a positive integer.

Heap Expanded The total number of kilobytes by which the heap expanded or contracted as a result of garbage collection. The valid format is a positive integer.

Heap Free (%) after GC The percentage of heap space that is available after garbage collection. The valid format is a positive integer.

Heap Status Whether the out-of-heap-space alert has been raised. Valid values are Normal and Out_of_heap_space.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Kbytes Free at Start of GC The number of kilobytes available in the heap before garbage collection began in response to this allocation failure. The valid format is a positive integer.

Kbytes Freed by GC The number of kilobytes freed by the garbage collector for this allocation failure. The valid format is a positive integer.

Kbytes Used The number of kilobytes in the heap that were in use when this allocation failure occurred. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Objects Moved The number of objects the garbage collector moved during compaction. The valid format is a positive integer.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The unique identifier of the JVM process (the class ID of the JVM). The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 11. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the WebSphere application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Time since Last Failure (ms) The time (in milliseconds) since the previous allocation failure. The valid format is a positive integer.

Time to Complete (ms) The time (in milliseconds) required to complete the action that resulted from this allocation failure. The valid format is a positive integer.

Total Kbytes Freed by GC The total number of kilobytes freed by the garbage collector in response to this allocation failure. The valid format is a positive integer.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Application Health Status attributes

The **Application Health Status** attributes provide information for real-time and historical application health status.

The attributes within this group are used to build the Application Health Summary workspace.

Application Health The combined application health level. Valid values are Unknown, Good, Fair, and Bad.

Application ID The unique identifier that is assigned automatically when the application is first configured and is preserved during the whole application life cycle. The valid format is a positive integer or -1 which means that Application ID is an aggregated statistic for all applications.

Application Name The name of the application to which the request belongs. The valid format is an alphanumeric string, with a maximum of 256 characters.

Application Status The status of the monitored application. Valid values are Standby, Discovered, Unknown, Starting, Running, Stopping, Stopped, and Failed.

Application Tier Health The health level of the application tier. Valid values are Unknown, Good, Fair, and Bad. Application tier health indicator is determined from EJB or custom request delays collected on the interval and compared against thresholds configured for application requests.

ASID The identifier (decimal) assigned to the address space running this servant region.

Backend Tier Health The health level of the backend tier. Backend tier health indicator is determined from JDBC, JCA, JNDI, JMS delays collected on the interval and compared against thresholds configured for application requests. Valid values are Unknown, Good, Fair, and Bad.

Client Tier Health The health level of the client tier. Valid values are Unknown, Good, Fair, and Bad. Client tier health indicator is determined from servlet/JSP or portal delays collected on the interval and compared against thresholds configured for application requests.

Completion Level The completion level of the requests during the interval. Valid values are Unknown, Good, Fair, and Bad. This attribute is determined from request data as the percentage of number of failed requests to the total number of application requests on the interval.

Custom Requests The availability indicator of the custom requests. Valid values are Unknown, Good, Fair, and Bad.

EJB Container The health level of the EJB container. Valid values are Unknown, Good, Fair, and Bad. This attribute is determined from EJB delay types collected during the interval and compared against application thresholds.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

JCA The overall health status of JEE Connector Architecture (JCA) resources used by applications. Valid values are Unknown, Good, Fair, and Bad. This attribute is determined from JCA delay types collected during the interval and compared against application thresholds.

JDBC The overall health status of Java DataBase Connectivity (JDBC) resources used by applications. Valid values are Unknown, Good, Fair, and Bad. This attribute is determined from JDBC delay types collected during the interval and compared against application thresholds.

JNDI The overall health status of Java Naming and Directory Interface (JNDI) resources used by applications. Valid values are Unknown, Good, Fair, and Bad. This attribute is determined from JNDI delay types collected during the interval and compared against application thresholds.

JMS The overall health status of Java Message Service (JMS) resources used by applications. Valid values are Unknown, Good, Fair, and Bad. This attribute is determined from JMS delay types collected during the interval and compared against application thresholds.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Portal Container The health level of the portal container. Valid values are Unknown, Good, Fair, and Bad. This attribute is determined from portal delay types collected during the interval and compared against application thresholds.

Response Level The health level of the response time for the requests. Valid values are Unknown, Good, Fair, and Bad. This attribute is determined from application requests response times collected during the interval and compared against application thresholds.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 12. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Indicates that this row is a summary row of statistical totals for all rows.

Web Container The health level of the web container. Valid values are Unknown, Good, Fair, and Bad.

SCA The health level of application SCA access. Valid values are Unknown, Good, Fair, and Bad.

WAS Node Name The name of the WebSphere Application Server node group to which the application server belongs. The valid format is an alphanumeric string, with a maximum of 64 characters.

WAS Cell Name The name of the WebSphere Application Server cell to which the application server belongs. The valid format is an alphanumeric string, with a maximum of 64 characters.

Process ID The process ID for the application server. The valid format is a 4-byte integer.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Application Monitoring Configuration attributes

The **Application Monitoring Configuration** attributes provide information for the Application Monitoring Configuration.

Use these attributes to monitor different WebSphere applications running within an application server. The attributes within this group are used to build the Selected Application - Configuration workspace.

Application Alias The alias name that you can optionally assign for the application. In practice, this attribute enables you to combine multiple applications under the same common alias and report their request in the Tivoli Enterprise Portal as it would come from same application. This attribute is blank by default. You can assign the value to it from Take Actions at any time in the application monitoring life cycle. The valid format is an alphanumeric string, with a maximum of 256 characters.

App ID The unique identifier that is assigned automatically when the application is first configured and is preserved during the whole application life cycle. The valid format is a positive integer.

Application Name The name of the application to which the request belongs. You can define the pattern of this name in the Application Registry workspace. The valid format is an alphanumeric string, with a maximum of 256 characters.

Bad Completion Rate (%) The bad completion rate threshold for the requests. The valid format is an alphanumeric string, with a maximum of 256 characters.

Baselining Elapsed Time The number of seconds during which the application baselining has been running. The valid format is a positive integer.

Baselining Status The status of the application baselining process. Valid values are Idle, Running, and Standby.

Baselining Scheduled Stop Time The date and time baselining is scheduled to finish. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 13. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Baselining Start Time The date and time when the application baselining was started. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 14. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day

Table 14. Format of the 12-character timestamp (continued)

Character String	Meaning
YY	Year
HH	Hour
MM	Minute
SS	Second

Baselining Update Interval The number of seconds that defines how often active baselining data is incrementally updated to the monitoring agent. The valid format is a positive integer.

Fair Completion Rate (%) The fair completion rate threshold for the requests. The valid format is an alphanumeric string, with a maximum of 256 characters.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Monitoring Status The current application monitoring status. Valid values are Discovered, Enabled, Disabled, and Standby.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Data Monitoring Level The custom request aggregation level for all application requests. Valid values are Default, Disabled, Level1, and Level2. This attribute is set to Default when the application is first discovered.

Request Data Sampling Rate The custom request aggregation rate for all application requests. The valid format is a positive integer.

Reflex Automation Mode When reflex automation mode is enabled, application monitoring level is automatically updated on WASAppHealth* situation event.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 15. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Application server status attributes

The **application server Status** attributes provide status information for all WebSphere application servers (and the WebSphere administrative server) being monitored by the agent.

The attributes within this group are used to build the WebSphere Agent workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and then select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Origin Node The server name subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Cluster Name The name of the server group (cluster) that this application server belongs to. The valid format is an alphanumeric string, with a maximum of 128 characters.

Cluster Type Indicates the type of the server group (cluster) the application server belongs to.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 128 characters.

Process ID The process identifier of the Java virtual machine. The valid format is a positive integer.

Regions Number The number of z/OS regions connected. This applies to z/OS environments only.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 16. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Mode The mode of the WebSphere application server.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Server Origin Node Name Indicates the origin node name of the server subnode.The valid format is an alphanumeric string, with a maximum of 128 characters.

Server Subnode Name The name of the server node in the navigation tree. The valid format is an alphanumeric string, with a maximum of 32 characters.

Server Type The type of server process. The valid values are:

Table 17. Types of server processes

Server Type	Definition
Unknown	The server type cannot be determined
AppServer	A process that executes applications
AdminServer	The administrative server you use when configuring WebSphere application server environments
NodeAgent	The WebSphere application server node agent
JMSServer	The WebSphere application server JMS server
DeploymentMgr	The WebSphere application server deployment (cell) manager
ManagedProcess	A stand-alone WebSphere application server process
UnManagedProcess	A WebSphere application server process that is managed by a WebSphere application server deployment manager through a node agent

Start Date and Time The date and time when the WebSphere application server started. The valid format is a timestamp. This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Status The status of the WebSphere application server. Valid values are Connected and Disconnected.

WAS Cell Name The name of the WebSphere application server cell to which this application server belongs. The valid format is an alphanumeric string, with a maximum of 64 characters.

WAS Configuration Repository Directory Name The name of the WebSphere application server configuration repository directory, which normally resides in the config subdirectory of the product installation root directory. The valid format is an alphanumeric string, with a maximum of 128 characters.

WAS Node Name The name of the WebSphere application server node group to which this application server belongs. The valid format is an alphanumeric string, with a maximum of 64 characters.

VE Host/port The valid format is an alphanumeric string, with a maximum of 256 characters.

Probe ID The valid format is an alphanumeric string, with a maximum of 128 characters.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Application server attributes

The **application server** attributes provide the status and summary data for a specific WebSphere application server instance.

The attributes provide performance data for the WebSphere application server runtime (JVM memory), thread pools, HTTP sessions, and configuration parameters. They also provide some information from other attribute groups to give an overall view of the WebSphere application server. Use the application server attributes in situations to monitor the health and performance of a WebSphere application server.

The attributes within this group are used to build the WebSphere application server and the Pool Analysis Workspace workspaces.

Important:

- The attributes in this attribute group contain zeros for performance data if your site sets the configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and you have not yet run applications that generate performance data. To report performance data in these attributes when you have installed and configured the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.

- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; this means the attributes in this attribute group initially contain zeros until you select the workspace and then select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

ASID The identifier (decimal) assigned to the address space running this servant region.

CPU Used (ms) Indicates the number of milliseconds the JVM CPU used during the interval. The valid format is a positive integer.

CPU Used (%) Indicates the percentage of the JVM CPU used during the interval. For UNIX users, this attribute has a meaningful value only if the Tivoli Enterprise Monitoring Agent is running with superuser authority. The valid format is a decimal (formatted to one decimal place).

Platform CPU Used (ms) Indicates the number of milliseconds the host platform (OS) CPU used during the interval. This feature does not apply to the z/OS platform.

Garbage Collection Monitoring The monitoring level for garbage-collection data. Valid values are Disabled and Enabled.

Instrumentation Level The JVM instrumentation level. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Hung Threads Total Total number of detected hung threads. The valid format is a positive integer.

Hung Threads Blocked Number of hung threads detected in the BLOCKED state. The valid format is a positive integer.

Hung Threads Waiting Number of hung threads detected in the WAITING state. The valid format is a positive integer.

Hung Threads Timed Waiting Number of hung threads detected in the TIMED_WAITING state. The valid format is a positive integer.

JVM Memory Free (Kbytes) The JVM free memory size in Kbytes.

JVM Memory Total (Kbytes) The JVM total memory size in Kbytes.

JVM Memory Used (Kbytes) The JVM used memory size in Kbytes.

JVM Memory Free (bytes) The JVM free memory size (in bytes). The valid format is a positive integer.

JVM Memory Total (bytes) The JVM total memory size (in bytes). The valid format is a positive integer.

JVM Memory Used (bytes) The JVM used memory size (in bytes). The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The process identifier of the Java virtual machine. The valid format is a positive integer.

Probe ID The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Data Monitoring Level The monitoring level for request data stored by the data collector. Valid values are Disabled, Level1 edge request data, such as servlets and JSPs are displayed), and Level2 (nested request data such as JDBC and JMS requests are also displayed).

Request Data Sampling Rate (%) The percentage of Level1 requests (that is, edge requests) being sampled. The valid format is a positive integer.

Resource Data Monitoring The monitoring level for resource (that is, PMI) data stored by the data collector. Valid values are Disabled and Enabled.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12 character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 18. Format of the 12 character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Instance Name The name of the WebSphere application server. This is a logical grouping of one or more server instances (called a "generic server" or "cluster") any one of which can run an application. The valid format is an alphanumeric string, with a maximum of eight characters.

Server Mode Indicates the mode of the WebSphere application server.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Server Type The type of the WebSphere application server. Valid values are Unknown, AppServer, AdminServer, NodeAgent, JMSServer, DeploymentManager, ManagedProcess, and UnManagedProcess.

Server Subnode Name Indicates the sub node name of the application server.

Start Date and Time The date and time when the WebSphere application server started. The valid format is a timestamp. This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Status The status of the WebSphere application server. Valid values are Connected and Disconnected.

Summary Indicates that this row is a summary row of statistical totals for all rows.

System Paging Rate (Kbytes/sec) The system paging rate in kilobytes per second during the interval. The valid format is a positive integer.

WAS Node Name The name of the WebSphere Application Server node group to which the application server belongs. The valid format is an alphanumeric string, with a maximum of 64 characters.

WAS Cell Name The name of the WebSphere Application Server cell to which the application server belongs. The valid format is an alphanumeric string, with a maximum of 64 characters.

Version The version of WebSphere application server. The valid format is an alphanumeric string, with a maximum of eight characters.

VE Host/port The valid format is an alphanumeric string, with a maximum of 256 characters.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Baseline attributes

The **Baseline** attributes provide information for baseline extract data for the given application.

The baselining collects statistical information about an application requests completion times and uses this information to assign fair and bad thresholds on the application requests. The product divides the whole request response times into buckets and collects individual hits into each bucket. Use these attributes to get statistics from individual requests collected during baselining interval.

The attributes within this group are used to build the Selected Request - Baseline workspace.

Application ID The unique identifier that is assigned automatically when the application is first configured and is preserved during the whole application life cycle. The valid format is a positive integer.

Bad Hits Percentage The percentage of bucket hits in the metric bad value zone. The valid format is a positive integer.

Bucket Number The bucket number of the baselining data. The valid format is a positive integer.

EJB Container Percent The average percent of time that bucket requests were executed inside EJB container. The valid format is a positive integer.

Fair Hits Percentage The percentage of bucket hits in the metric fair value zone. The valid format is a positive integer.

Good Hits Percentage The percentage of bucket hits in the metric good value zone. The valid format is a positive integer.

Hits Percentage The percentage of hits for the bucket during the baselining. The valid format is a positive integer.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

JCA Percent The average percent of time that bucket requests spent for JCA access. The valid format is a positive integer.

JDBC Percent The average percent of time that bucket requests spent for JDBC access. The valid format is a positive integer.

JMS Percent The average percent of time that bucket requests spent for JMS access. The valid format is a positive integer.

JNDI Percent The average percent of time that bucket requests spent for JNDI access. The valid format is a positive integer.

Lower Boundary (msec) The lower boundary of bucket response times in milliseconds. The valid format is a positive integer.

Metric ID The metric identifier of the baselining data. The valid format is a positive integer.

Metric Type The metric type of the baselining data. Valid formats are Request, Error, and Resource.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Portal Percent The average percent of time that bucket requests were executed inside portal container. The valid format is a positive integer.

Response Time Mean (msec) The mean time of bucket response times. The valid format is a positive integer.

SCA Percent The average percent of time that bucket requests spent for SCA access. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 19. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Hits Percentage The percentage of bucket hits in the metric selection value zone. The valid format is a positive integer.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Servlet Container Percent The average percent of time that bucket requests were executed inside the servlet container. The valid format is a positive integer.

Total Hits The total hits number for the bucket during the baselining. The valid format is a positive integer.

Upper Boundary (msec) The upper boundary of bucket response times. The valid format is a positive integer.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Client Communications attributes

The **Client Communications** attributes display overall statistics about server-side monitoring and a client-side API to retrieve performance data.

The attributes within this group are used to build the Client Communications workspace.

Restriction: Attributes in this group are only provided for IBM WebSphere application server version 6.0 or later.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

API Connections The number of API sessions being used by clients that are currently network connected to this application server. Some of these API connections might be being used by internal system processes on behalf of a client. The valid format is a positive integer.

Buffered Read (bytes) The number of bytes of data that have been received from the network and are held pending further processing. Large values might indicate that the application server is unable to process data fast enough to keep up with the clients attached. The valid format is a positive integer.

Buffered Write (bytes) The number of bytes of data being held pending transmission. Large values might indicate network congestion or clients which are unable to process data fast enough to keep up with the application server. The valid format is a positive integer.

Clients Attached The number of distinct client processes currently network connected to this application server. The valid format is a positive integer.

Errors The communication errors that have occurred and resulted in a network connection to a client being disconnected. The valid format is a positive integer.

Instrumentation Level The instrumentation level for the client communications. For WebSphere 5, the valid values are None, Low, Medium, High, and Maximum; for WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Message Read (bytes) The number of bytes of message data received from client processes over network connections. This does not include data used to negotiate the transmission of messages. The valid format is a positive integer.

Messages Received at JMS 0 Priority (bytes) The number of messages received at JMS priority 0. The valid format is a positive integer.

Messages Received at JMS 1 Priority (bytes) The number of messages received at JMS priority 1. The valid format is a positive integer.

Messages Received at JMS 2 Priority (bytes) The number of messages received at JMS priority 2. The valid format is a positive integer.

Messages Received at JMS 3 Priority (bytes) The number of messages received at JMS priority 3. The valid format is a positive integer.

Messages Received at JMS 4 Priority (bytes) The number of messages received at JMS priority 4. The valid format is a positive integer.

Messages Received at JMS 5 Priority (bytes) The number of messages received at JMS priority 5. The valid format is a positive integer.

Messages Received at JMS 6 Priority (bytes) The number of messages received at JMS priority 6. The valid format is a positive integer.

Messages Received at JMS 7 Priority (bytes) The number of messages received at JMS priority 7. The valid format is a positive integer.

Messages Received at JMS 8 Priority (bytes) The number of messages received at JMS priority 8. The valid format is a positive integer.

Messages Received at JMS 9 Priority (bytes) The number of messages received at JMS priority 9. The valid format is a positive integer.

Messages Sent at JMS 0 Priority (bytes) The number of messages transmitted at JMS priority 0. The valid format is a positive integer.

Messages Sent at JMS 1 Priority (bytes) The number of messages transmitted at JMS priority 1. The valid format is a positive integer.

Messages Sent at JMS 2 Priority (bytes) The number of messages transmitted at JMS priority 2. The valid format is a positive integer.

Messages Sent at JMS 3 Priority (bytes) The number of messages transmitted at JMS priority 3. The valid format is a positive integer.

Messages Sent at JMS 4 Priority (bytes) The number of messages transmitted at JMS priority 4. The valid format is a positive integer.

Messages Sent at JMS 5 Priority (bytes) The number of messages transmitted at JMS priority 5. The valid format is a positive integer.

Messages Sent at JMS 6 Priority (bytes) The number of messages transmitted at JMS priority 6. The valid format is a positive integer.

Messages Sent at JMS 7 Priority (bytes) The number of messages transmitted at JMS priority 7. The valid format is a positive integer.

Messages Sent at JMS 8 Priority (bytes) The number of messages transmitted at JMS priority 8. The valid format is a positive integer.

Messages Sent at JMS 9 Priority (bytes) The number of messages transmitted at JMS priority 9. The valid format is a positive integer.

Message Written (bytes) The number of bytes of message data sent to client processes over network connections. This does not include data used to negotiate the transmission of messages. The valid format is a positive integer.

Messaging Engine Name The name of the message engine. The value format is an alphanumeric string, with a maximum of 256 characters.

Multicast Send Messages The number of messages transmitted using multicast protocols. The valid format is a positive integer.

Multicast Write The number of bytes transmitted using multicast protocols. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Reads The number of read operations used to receive data from client processes through network connections. The valid format is a positive integer.

Reads Blocked The number of read operations that could not be completed immediately. This number can be used as an indicator of network congestion when communicating with client processes. The valid format is a positive integer.

Received at High Priority (bytes) The number of bytes of data received at a high priority. Message data cannot be transmitted with this priority, so typically these bytes of data comprise control transmissions used to negotiate the flow of messages. The valid format is a positive integer.

Received at Highest Priority (bytes) The number of bytes of data received at the highest possible priority. Message data cannot be transmitted with this priority, so typically these bytes of data comprise control transmissions used to negotiate the flow of messages. The valid format is a positive integer.

Received at JMS 0 Priority (bytes) The number of bytes of data received at the priority used by JMS priority 0 messages. Typically this is an accurate measure of the number of bytes of message data received at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Received at JMS 1 Priority (bytes) The number of bytes of data received at the priority used by JMS priority 1 messages. Typically this is an accurate measure of the number of bytes of message data received at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Received at JMS 2 Priority (bytes) The number of bytes of data received at the priority used by JMS priority 2 messages. Typically this is an accurate measure of the number of bytes of message data received at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Received at JMS 3 Priority (bytes) The number of bytes of data received at the priority used by JMS priority 3 messages. Typically this is an accurate measure of the number of bytes of message data received at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Received at JMS 4 Priority (bytes) The number of bytes of data received at the priority used by JMS priority 4 messages. Typically this is an accurate measure of the number of bytes of message data received at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Received at JMS 5 Priority (bytes) The number of bytes of data received at the priority used by JMS priority 5 messages. Typically this is an accurate measure of the number of bytes of message data received at this priority level. However, from

time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Received at JMS 6 Priority (bytes) The number of bytes of data received at the priority used by JMS priority 6 messages. Typically this is an accurate measure of the number of bytes of message data received at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Received at JMS 7 Priority (bytes) The number of bytes of data received at the priority used by JMS priority 7 messages. Typically this is an accurate measure of the number of bytes of message data received at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Received at JMS 8 Priority (bytes) The number of bytes of data received at the priority used by JMS priority 8 messages. Typically this is an accurate measure of the number of bytes of message data received at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Received at JMS 9 Priority (bytes) The number of bytes of data received at the priority used by JMS priority 9 messages. Typically this is an accurate measure of the number of bytes of message data received at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Received at Low Priority (bytes) The number of bytes of data received at a low priority. Message data cannot be transmitted with this priority, so typically these bytes of data comprise control transmissions used to negotiate the flow of messages. The valid format is a positive integer.

Received at Lowest Priority (bytes) The number of bytes of data received at the lowest possible priority. Message data cannot be transmitted with this priority, so typically these bytes of data comprise control transmissions used to negotiate the flow of messages. The valid format is a positive integer.

Received at Very High Priority (bytes) The number of bytes of data received at a high priority. Message data cannot be transmitted with this priority, so typically these bytes of data comprise control transmissions used to negotiate the flow of messages. The valid format is a positive integer.

Received at Very Low Priority (bytes) The number of bytes of data received at a low priority. Message data cannot be transmitted with this priority, so typically these bytes of data comprise control transmissions used to negotiate the flow of messages. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 20. Format of the 12-character timestamp

Character String	Meaning
MM	Month

Table 20. Format of the 12-character timestamp (continued)

Character String	Meaning
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Sent at High Priority (bytes) The number of bytes of data transmitted at a high priority. Message data cannot be transmitted with this priority, so typically these bytes of data comprise control transmissions used to negotiate the flow of messages. The valid format is a positive integer.

Sent at Highest Priority (bytes) The number of bytes of data transmitted at the highest possible priority for transmission. Message data cannot be transmitted with this priority, so typically these bytes of data comprise control transmissions used to negotiate the flow of messages. The valid format is a positive integer.

Sent at JMS 0 Priority (bytes) The number of bytes of data transmitted at the priority used by JMS priority 0 messages. Typically this is an accurate measure of the number of bytes of message data transmitted at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Sent at JMS 1 Priority (bytes) The number of bytes of data transmitted at the priority used by JMS priority 1 messages. Typically this is an accurate measure of the number of bytes of message data transmitted at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Sent at JMS 2 Priority (bytes) The number of bytes of data transmitted at the priority used by JMS priority 2 messages. Typically this is an accurate measure of the number of bytes of message data transmitted at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Sent at JMS 3 Priority (bytes) The number of bytes of data transmitted at the priority used by JMS priority 3 messages. Typically this is an accurate measure of the number of bytes of message data transmitted at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Sent at JMS 4 Priority (bytes) The number of bytes of data transmitted at the priority used by JMS priority 4 messages. Typically this is an accurate measure of the number of bytes of message data transmitted at this priority level. However,

from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Sent at JMS 5 Priority (bytes) The number of bytes of data transmitted at the priority used by JMS priority 5 messages. Typically this is an accurate measure of the number of bytes of message data transmitted at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Sent at JMS 6 Priority (bytes) The number of bytes of data transmitted at the priority used by JMS priority 6 messages. Typically this is an accurate measure of the number of bytes of message data transmitted at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Sent at JMS 7 Priority (bytes) The number of bytes of data transmitted at the priority used by JMS priority 7 messages. Typically this is an accurate measure of the number of bytes of message data transmitted at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Sent at JMS 8 Priority (bytes) The number of bytes of data transmitted at the priority used by JMS priority 8 messages. Typically this is an accurate measure of the number of bytes of message data transmitted at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Sent at JMS 9 Priority (bytes) The number of bytes of data transmitted at the priority used by JMS priority 9 messages. Typically this is an accurate measure of the number of bytes of message data transmitted at this priority level. However, from time to time, control transmissions used to negotiate the flow of messages might be transmitted at this priority level. The valid format is a positive integer.

Sent at Low Priority (bytes) The number of bytes of data transmitted at a low priority. Message data cannot be transmitted with this priority, so typically these bytes of data comprise control transmissions used to negotiate the flow of messages. The valid format is a positive integer.

Sent at Lowest Priority (bytes) The number of bytes of data transmitted at the lowest priority. Message data cannot be transmitted with this priority, so typically these bytes of data comprise control transmissions used to negotiate the flow of messages. The valid format is a positive integer.

Sent at Very High Priority (bytes) The number of bytes of data transmitted at a high priority. Message data cannot be transmitted with this priority, so typically these bytes of data comprise control transmissions used to negotiate the flow of messages. The valid format is a positive integer.

Sent at Very Low Priority (bytes) The number of bytes of data transmitted at a low priority. Message data cannot be transmitted with this priority, so typically these bytes of data comprise control transmissions used to negotiate the flow of messages. The valid format is a positive integer.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Whether this row is a summary row of statistical totals for all messaging engines. Valid values are No and Yes.

Total Read (bytes) The number of bytes of data received from client processes. This includes both message data and data used to negotiate the transmission of messages. The valid format is a positive integer.

Total Written (bytes) The number of bytes of data sent to client processes. This includes both message data and data used to negotiate the transmission of messages. The valid format is a positive integer.

Writes The number of write operations used to transmit data to client processes via network connections. The valid format is a positive integer.

Writes Blocked The number of write operations that could not be completed immediately. This number can be used as an indicator of network congestion when communicating with client processes. The valid format is a positive integer.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Container Object Pools attributes

Use the **Container Object Pools** attributes in situations to monitor the effectiveness of the object cache and of resource usage.

These attributes provide aggregated information for each defined EJB container that aggregates bean object pool performance for all Enterprise beans deployed to that container and aggregated information for the application server that aggregates bean object pool performance data for all Enterprise beans deployed to the application server. The attributes within this group are used to build the Container Object Pools workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Average Objects Discarded The average number of objects discarded each time the bean object pool was emptied of idle objects during the interval. The valid format is a decimal (formatted to three decimal places).

Objects Discarded Count The number of objects joined in Average Objects Discarded. The valid format is a 4-byte integer. If the number is too big to be stored, the value -2 is used.

Average Objects in Pool The average number of objects in the bean object pool during the interval. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Discard Count The number of times the object returned to the bean-object pool was discarded because the bean object pool was already full during the interval. The valid format is a positive integer.

Discard Rate (per sec) The bean object pool discard rate (per second) for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Drain Count The number of times the bean object pool was found idle and an attempt was made to remove idle objects during the interval. The valid format is a positive integer.

Drain Rate (per sec) The number of times (per second) that the bean object pool was found idle during the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Find Count The number of times a retrieval call found an available object in the bean object pool during the interval. The valid format is a positive integer.

Find Rate (per sec) The availability of bean object pool retrievals (per second) for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Get Count The number of calls retrieving an object from the bean object pool during the interval. The valid format is a positive integer.

Get Rate (per sec) The number of bean objects retrieved (per second) for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Instrumentation Level The instrumentation level for this container. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Container Name The name of the container. The valid format is an alphanumeric string, with a maximum of 64 characters.

Return Count The number of calls returning an object to the bean object pool during the interval. The valid format is a positive integer.

Return Rate (per sec) The bean objects returned (per second) for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 21. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the WebSphere application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Set Instrumentation Level Type Indicates the WebSphere resource category, which is used by the agent to modify the Instrumentation Level for transaction data collection.

Summary of All Containers Whether this row is a summary row of statistical totals aggregated over all bean object pools in the application server. Valid values are No and Yes.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Container Transactions attributes

The **Container Transactions** attribute group provides performance information about transactions that run in each defined EJB container and an aggregated value for all transactions that run in the application server.

Use the Container Transactions attributes in situations to monitor transaction activity for each EJB container and for the application server. The attributes within this group are used to build the Container Transactions workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Global Transaction before Completion Duration (ms) The average duration before completion for global transactions during the interval. The valid format is a decimal (formatted to three decimal places).

Global Transaction before Completion Duration Count The count of times that were averaged for Global Transaction before Completion Duration. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Global Transaction Commit Duration (ms) The time (in milliseconds) that the transaction required for its resolution phase during the interval. The valid format is a decimal (formatted to three decimal places).

Global Transaction Commit Duration Count The count of times that were averaged for Global Transaction Commit Duration. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Global Transaction Commit Rate (per sec) The number of times (per second) global transactions were committed during the interval. The valid format is a decimal (formatted to three decimal places).

Global Transaction Duration (ms) The average duration (in milliseconds) for global transactions during the interval. The valid format is a decimal (formatted to three decimal places).

Global Transaction Duration Count The count of times that were averaged for Global Transaction Duration. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Global Transaction Optimize Rate (per sec) The number of times (per second) that global transactions were converted to single phase since the previous sample. The valid format is a decimal (formatted to three decimal places).

Global Transaction Prepare Duration (ms) The average preparation duration (in milliseconds) for global transactions during the interval. The valid format is a decimal (formatted to three decimal places).

Global Transaction Prepare Duration Count The count of times that were averaged for Global Transaction Prepare Duration. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Global Transaction Rollback Rate (per sec) The number of times (per second) that global transactions were undone because they could not complete during the interval. The valid format is a decimal (formatted to three decimal places).

Global Transaction Timeout Rate (per sec) The number of global transaction timeouts (per second) since the previous sample. The valid format is a decimal (formatted to three decimal places).

Global Transaction Timeouts The number of global transactions that timed out during the interval. The valid format is a positive integer.

Global Transactions Active The number of concurrently active global transactions running in the container during the interval. Global transactions involve multiple resource managers. The valid format is a decimal (formatted to three decimal places).

Global Transactions Begin Rate (per sec) The number of times global transactions were started (per second) during the interval. The valid format is a decimal (formatted to three decimal places).

Global Transactions Begun The total number of global transactions that the server began during the interval. The valid format is a positive integer.

Global Transactions Committed The number of global transactions that were completed during the interval. The valid format is a positive integer.

Global Transactions Involve Rate (per sec) The number of times (per second) global transactions were involved during the interval. The valid format is a positive integer.

Global Transactions Involved The number of global transactions that were involved at the server during the interval, including transactions that were begun or imported. The valid format is a positive integer.

Global Transactions Rolled Back The total number of global transactions that were undone because they could not complete during the interval. The valid format is a positive integer.

Global Transactions Optimized The number of global transactions converted to single phase for optimization since the previous sample. The valid format is a positive integer.

Instrumentation Level The instrumentation level for this container. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Local Transaction before Completion Duration (ms) The average duration before completion for local transactions during the interval. The valid format is a decimal (formatted to three decimal places).

Local Transaction before Completion Duration Count The count of times that were averaged for Local Transaction before Completion Duration. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Local Transaction Commit Duration (ms) The average duration for commit for local transactions during the interval. The valid format is a decimal (formatted to three decimal places).

Local Transaction Commit Duration Count The count of times that were averaged for Local Transaction Commit Duration. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Local Transaction Commit Rate (per sec) The number of local transactions (per second) committed during the interval. The valid format is a decimal (formatted to three decimal places).

Local Transaction Duration (ms) The average duration (in milliseconds) of local transactions during the interval. The valid format is a decimal (formatted to three decimal places).

Local Transaction Duration Count The count of times that were averaged for Local Transaction Duration. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Local Transaction Rollback Rate (per sec) The number of times (per second) that local transactions were undone because they could not be completed during the interval. The valid format is a decimal (formatted to three decimal places).

Local Transaction Timeout Rate (per sec) The number of local transactions that timed out per second during the interval. The valid format is a decimal (formatted to three decimal places).

Local Transaction Timeouts The number of local transactions that timed out during the interval. The valid format is a positive integer.

Local Transactions Active The number of concurrently active local transactions running in the container during the interval. Local transactions involve a single resource manager. The valid format is a decimal (formatted to three decimal places).

Local Transactions Begin Rate (per sec) The number of times (per second) local transactions were started during the interval. The valid format is a positive integer.

Local Transactions Begun The number of local transactions begun at the server since the previous sample. The valid format is a positive integer.

Local Transactions Committed The number of local transactions committed during the interval. The valid format is a positive integer.

Local Transactions Rolled Back The number of local transactions that were undone during the interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and

SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 22. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Set Instrumentation Level Type Indicates the WebSphere resource category, which is used by the agent to modify the Instrumentation Level for transaction data collection.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Data sources attributes

The **Data sources** attributes provide database usage information.

These attributes provide traffic information such as, response times for database requests, the frequencies at which database connections are created and destroyed, and how often databases are accessed. The attributes within this group are used to build the Datasources workspace.

Important: The attributes within this attribute group contain meaningful values only if your site has set the request data monitoring level to Level2 to collect data on data source requests.

Application ID The unique identifier that is assigned automatically when the application is first configured and is preserved during the whole application life cycle. The valid format is a positive integer or -1 which means that Application ID is aggregated statistic for all applications.

ASID The identifier (decimal) assigned to the address space running this servant region.

Average Processing Time (ms) The total average processing time (in milliseconds) that the data source is used by an application. The valid format is a decimal (formatted to three decimal places).

Processing Time Count The count of times that were averaged for Average Processing Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Average Query Processing Time (ms) The average time (in milliseconds) per request used by queries to the data source. The valid format is a decimal (formatted to three decimal places).

Average Update Processing Time (ms) The average time (in milliseconds) per request used by updates to the data source. The valid format is a decimal (formatted to three decimal places).

Connection Average Wait Time (ms) The average time (in milliseconds) that applications had to wait for a connection. The valid format is a decimal (formatted to three decimal places).

Connection Count The number of connections to the data source. The valid format is a positive integer.

Connection Max Wait Time (ms) The worst-case time (in milliseconds) that applications had to wait for a connection. The valid format is a positive integer.

Connection Rate (per sec) The number of connection requests (per second) created for the data source. The valid format is a decimal (formatted to three decimal places).

Connection Total Wait Time (ms) The total time (in milliseconds) that applications had to wait for a connection to the data source. The valid format is a positive integer.

Database Product The name of the database product. The valid format is an alphanumeric string, with a maximum of 128 characters.

Database Product Version The version of the database product. The valid format is an alphanumeric string, with a maximum of 128 characters.

Datasource Name The name of the data source. The valid format is an alphanumeric string, with a maximum of 256 characters.

Datasource Label A shortened version of Datasource Name, used to display the data source name in the chart view. The valid format is an alphanumeric string, with a maximum of 12 characters.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Origin Node The name of the application server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The unique identifier of the process running the Java Virtual Machine (JVM). The valid format is a positive integer.

Query Count The number of queries performed against the data source. The valid format is a positive integer.

Query Rate (per sec) The number of queries (per second) being made to the data source. The valid format is a decimal (formatted to three decimal places).

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 23. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Sampling Rate (%) The percentage of edge requests-such as servlets and JSPs-that were sampled for data source requests during the interval. The valid format is a positive integer.

Server Name The name of the WebSphere application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Indicates that this row is a summary row of statistical totals for all rows.

Total Query Processing Time (ms) The total time (in milliseconds) used to process queries made to the data source. The valid format is a positive integer.

Total Update Processing Time (ms) The total time (in milliseconds) used to update the data source. The valid format is a positive integer.

Total Wait Time (ms) The time (in milliseconds) that applications had to wait for connections to the data source. The valid format is a positive integer.

Update Count The number of updates performed against the data source. The valid format is a positive integer.

Update Rate (per sec) The number of updates (per second) made to the data source. The valid format is a decimal (formatted to three decimal places).

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

DB Connection Pools attributes

The **DB Connection Pools** attributes provide information about the database connection pool for each defined data source, and an aggregated value that aggregates over all data sources.

Examples of DB Connection Pools include; the number of threads waiting for a connection and the number of connections created and released. Use the DB Connection Pools attributes to analyze JDBC performance for WebSphere application server applications. The attributes within this group are used to build the DB Connection Pools and the Pool Analysis workspaces.

Important:

- The attributes within this attribute group contain zeros for performance data if your site set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and then select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Application ID Indicates JEE application ID.

Average Free Pool Size Indicates the average size of the pool based upon the number of free connections.

Average Pool Size The average size of the pool (based upon the number of connections) during the interval. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Average Usage Time (ms) The average time (in milliseconds) a connection was in use; blank if no transactions are completed during the interval. The valid format is a decimal (formatted to three decimal places).

Usage Time Count The count of times that were averaged for Average Usage Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Average Wait Time (ms) The average time (in milliseconds) a client waited for a connection; blank if no transactions are completed during the interval. The valid format is a decimal (formatted to three decimal places).

Wait Time Count The count of times that were averaged for Average Wait Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Average Waiting Threads The average number of threads waiting for a connection during the interval. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Connection Allocation Rate (per sec) The connections allocated (per second) for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Connection Creation Rate (per sec) The connections created (per second) during the interval. The valid format is a decimal (formatted to three decimal places).

Connection Destruction Rate (per sec) The connections released (per second) during the interval. The valid format is a positive integer.

Connection Handle Indicates the number of Connection objects in use for a particular connection pool.

Connection Used The number of managed connection objects in use for a particular EIS product name. The valid format is a positive integer.

Connections Allocated The number of connections allocated during the interval. The valid format is a positive integer.

Connections Created The number of connections created during the interval. The valid format is a positive integer.

Connections Destroyed The number of connections released during the interval. The valid format is a positive integer.

Connections Granted The sum of connections allocated and connections created during the interval. The valid format is a positive integer.

Datasource Label The abbreviated name of the data source. The valid format is an alphanumeric string, with a maximum of 32 characters.

Datasource Name The name of the data source. The valid format is an alphanumeric string, with a maximum of 256 characters.

Instrumentation Level The instrumentation level for the database connection pool for the data source. For WebSphere 5, the valid values are None, Low, Medium, High, and Maximum; for WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

JDBC Time (ms) Indicates the amount of time spent running in the JDBC driver which includes time spent in the JDBC driver, network, and database.

JDBC Time Count The count of times that were used for JDBC Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Maximum Pool Size The maximum number of connections that can be created in this connection pool. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Pool Size Indicates the size of the connection pool.

Percent of Time Pool at Max The average percentage of time the number of connections in the pool reached the maximum number during the interval. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Percent Used The average percentage of the connection pool in use during the interval. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Percent Used Bad The bad percent of pool usage by application. The valid format is a positive integer.

Percent Used Fair The fair percent of pool usage by application. The valid format is a positive integer.

Percent Used Good The good percent of pool usage by application. The valid format is a positive integer.

Prep Statement Cache Discard Rate (per sec) The cache discards (per second) of prepared statements during the interval. The valid format is a decimal (formatted to three decimal places).

Prep Statement Cache Discards The number of prepared statements discarded from the cache during the interval. The valid format is a positive integer.

Pool Size Indicates the size of the connection pool.

Return Count The number of connections that applications returned to the pool during the interval. The valid format is a positive integer.

Return Rate (per sec) The number of connections (per second) returned since the previous sample. The valid format is a decimal (formatted to three decimal places).

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and

SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 24. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Set Instrumentation Level Type Indicates the WebSphere resource category, which is used by the agent to modify the Instrumentation Level for transaction data collection.

Summary of All DB Connections Whether this row is a summary row of statistical totals collected for all the DB connection pools. Valid values are No and Yes.

Thread Timeout Rate (per sec) The number of threads (per second) that timed out during the interval. The valid format is a decimal (formatted to three decimal places).

Threads Timed Out The number of threads that timed out while waiting for a connection during the interval. The valid format is a positive integer.

Total Usage (ms) The total time (in milliseconds) the connection object used. The valid format is a decimal (formatted to three decimal places).

Total Wait (ms) The total time (in milliseconds) the connection object waited. The valid format is a decimal (formatted to three decimal places).

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

DC Messages attributes

The **DC Messages** attributes provide message information from WebSphere data collector.

The attributes within this group are used to build the Log Analysis workspace.

ASID The identifier (decimal) assigned to the address space running this servant region.

Component The name of the component that caused the error. The value format is an alphanumeric string, with a maximum of 32 characters.

Event Date and Time The date and time the event occurred. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 25. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

File Name The name of the file. The valid format is an alphanumeric string, with a maximum of 256 characters.

Message Description The description of the message. The valid format is an alphanumeric string, with a maximum of 256 characters.

Message ID The unique identifier of the message. The valid format is an alphanumeric string, with a maximum of eight characters.

Method Name The name of the method. The valid format is an alphanumeric string, with a maximum of 256 characters.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 128 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID Indicates the process ID of the JVM.

Sequence Number The sequence number in the JMX notifications stream. The valid format is a positive integer.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Severity The severity of the message. Valid values are Info, Warning, Error, and Severe.

Thread ID The identifier of the thread where the event occurred. The valid format is an alphanumeric string, with a maximum of 16 characters.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

DCS Stack attributes

The **DCS Stack** attributes reports information about the statistical data within the entire WebSphere application server domain, including multiple nodes and servers.

Examples of DCS Stack attributes include; the incoming and outgoing message size, the number of incoming and outgoing messages, congestion events, and message buffer reallocations. The attributes within this group are used to build the DCS Stacks workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Average Incoming Message Size The average size (in bytes) of the messages that were received by the DCS stack. The valid format is a positive integer.

Average Incoming Message Size Count The count of individual message sizes that were averaged for Average Incoming Message Size. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Average Outgoing Message Size The average size (in bytes) of the messages that were sent through the DCS stack. The valid format is a positive integer.

Average Outgoing Message Size Count The count of individual message sizes that were averaged for Average Outgoing Message Size. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Coalesce Time The amount of time it actually takes to coalesce a view. The valid format is a decimal (formatted to three decimal places).

Coalesce Time Count The count of times that were used for Coalesce Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

DCS Stack Name The name of the Topic Space. The value format is an alphanumeric string, with a maximum of 256 characters.

Group Size The size of the group the local member belongs to. The valid format is a positive integer.

High Severity Congestion Events The number of times that a high severity congestion event for outgoing messages was raised. The valid format is a positive integer.

Incoming Messages The number of messages received by the DCS stack. The valid format is a decimal (formatted to three decimal places).

Instrumentation Level The instrumentation level for the DCS stack. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Join View Change Time The time to do a merge view change. The DCS stack is blocked during this time. The valid format is a decimal (formatted to three decimal places).

Join View Change Time Count The count of times that were used for Join View Change Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Maximum Incoming Message Size The maximal size (in bytes) of the messages that were received by the DCS stack. The valid format is a positive integer.

Maximum Outgoing Message Size The maximal size (in bytes) of the messages that were sent through the DCS stack. The valid format is a positive integer.

Message Buffer Reallocations The number of message buffer reallocations due to inadequate buffer size. If this number is larger than 20 percent of the number of sent messages, contact IBM Support. The valid format is a positive integer.

Minimum Incoming Message Size The minimal size (in bytes) of the messages that were received by the DCS stack. The valid format is a positive integer.

Minimum Outgoing Message Size The minimal size (in bytes) of the messages that were sent through the DCS stack. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Outgoing Messages The number of messages sent through the DCS stack. The valid format is a positive integer.

Remove View Change Time The time to do a split view change. The DCS stack is blocked during this time. The valid format is a decimal (formatted to 3 decimal places).

Remove View Change Time Count The count of times that were used for Remove View Change Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Row Number The row number. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 26. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Sent Messages The number of messages sent through the DCS stack. The valid format is a positive integer.

Summary Whether this row is a summary row of statistical totals for all rows. Valid values are No and Yes.

Suspicions The number of times that the local member suspected other members. The valid format is a positive integer.

Synchronization Completion Time The amount of time needed to guarantee that all view members are synchronized. The valid format is a decimal (formatted to three decimal places).

Synchronization Completion Time Count The count of times that were used for Synchronization Completion Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Synchronization Timeouts The number of times that the synchronization procedure timed out. The valid format is a positive integer.

View Changes The number of times that this member underwent view changes. The valid format is a positive integer.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Durable Subscriptions attributes

The **Durable Subscriptions** attributes display overall statistics about the durable subscriptions of a selected topic.

A durable subscription can be used to preserve messages published on a topic while the subscriber is not active. The attributes within this group are used to build the Durable Subscriptions workspace.

Important:

- The attributes in this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.
- Attributes in this group are only provided for IBM WebSphere application server version 6.0 or later.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Aggregate Message Wait Time The time spent by messages in the bus at consumption. If this time is not what was expected, view the message using the admin console to decide what action needs to be taken. The valid format is a positive integer.

Aggregate Message Wait Time Count The count of times that were used for Aggregate Message Wait Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Assured Persistent Messages Consumed The number of Assured Persistent messages consumed, for the lifetime of this messaging engine. The valid format is a positive integer.

Available Message The number of messages waiting to be consumed. The valid format is a positive integer.

Best Effort Non-persistent Messages Consumed The number of best effort non-persistent messages consumed, for the lifetime of this messaging engine. The valid format is a positive integer.

Express® Non-persistent Messages Consumed The number of express non-persistent messages consumed, for the lifetime of this messaging engine. The valid format is a positive integer.

Instrumentation Level The instrumentation level for the Durable Subscriptions. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Local Oldest Message Age The longest time any message has spent on this subscription. If this time is not what was expected, view the message using the admin console to decide what action needs to be taken. The valid format is a positive integer.

Local Oldest Message Age Count The count of individual message ages that were used for Local Oldest Message Age. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Local Message Wait Time The time spent by messages on this durable subscription at consumption. If this time is not what was expected, view the message using the admin console to decide what action needs to be taken. The valid format is a positive integer.

Local Message Wait Time Count The count of times that were used for Local Message Wait Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Messaging Engine Name The name of the message engine. The value format is an alphanumeric string, with a maximum of 256 characters.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Reliable Non-persistent Messages Consumed The number of reliable non-persistent messages consumed, for the lifetime of this messaging engine. The valid format is a positive integer.

Reliable Persistent Messages Consumed The number of Reliable Persistent messages consumed, for the lifetime of this messaging engine. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 27. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute

Table 27. Format of the 12-character timestamp (continued)

Character String	Meaning
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Subscription Name The name of the subscriptions. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Whether this row is a summary row of statistical totals for all rows. Valid values are No and Yes.

Topic Space Name The name of the topic space. The valid format is an alphanumeric string, with a maximum of 256 characters.

Total Messages Consumed The total number of messages consumed from this durable subscription. The valid format is a positive integer.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Dynamic Cache attributes

The **Dynamic Cache** attribute group provides information about the dynamic cache.

WebSphere application server consolidates several caching activities, including servlets, web services, and WebSphere commands, into one service called the dynamic cache. These caching activities work together to improve application performance and share many configuration parameters, which are set in an application server dynamic cache service. The dynamic cache works within an application server Java Virtual Machine (JVM), intercepting calls to cacheable objects, for example, through a servlet service method or an execute method of a command. It either stores the object output to, or serves the object content from, the dynamic cache.

The attributes within this group are used to build the Cache Analysis workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.

- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Cache Instance Name Indicates the cache instance name.

Cache Instance Type Indicates Cache instance type.

Current In-Memory Cache Size The number of cache entries currently in memory. The valid format is a positive integer.

In-Memory and Disk Timeout Rate (per sec) The rate (per second) of total in-memory and disk timeouts for the sampling interval. The valid format is a decimal (formatted to three decimal places).

In-Memory and Disk Timeouts The total number of in-memory and disk timeouts during the sampling interval. The valid format is a positive integer.

Instrumentation Level The instrumentation level for the dynamic cache. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Maximum In-Memory Cache Size The maximum number of cache entries in memory. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 28. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the WebSphere application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Set Instrumentation Level Type Indicates the WebSphere resource category, which is used by the agent to modify the Instrumentation Level for transaction data collection.

Summary of Cache Indicates that this row is a summary row of statistical totals collected for all the cache object types.

PMI Enable The valid format is a 4-byte integer.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Dynamic Cache Templates attributes

The **Dynamic Cache Templates** attribute group provides information about the cache template data.

A cache template is an object type defined by a cache policy specified in the WebSphere application server cachespec.xml file. A cache policy specifies the cache rules indicating what is cached, the invalidation, timeout conditions, and other data. The attributes within this group are used to build the Cache Analysis workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Cache Instance Name The cache instance name.

Cache Instance Type The cache instance type.

Cache Miss Rate (per sec) The rate (per second) of requests for this cacheable object type that were not found in the cache during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Cache Misses The number of requests for this cacheable object type that were not found in the cache (in memory, on disk or on other cooperating caches). This would have caused the underlying servlet or command to be executed in order to obtain the results. The valid format is a positive integer.

Cache Object Type The name of the object type specified in the cache policy of the cache spec XML file. The valid format is an alphanumeric string, with a maximum of 256 characters.

Client Request Rate (per sec) The request rate (per second) for this cacheable object type made by clients directly accessing this application server. The valid format is a decimal (formatted to three decimal places).

Client Requests The number of requests for this cacheable object type made by clients directly accessing this application server. The valid format is a positive integer.

Cluster Request Rate (per sec) The request rate (per second) for this cacheable object type made by cooperating caches in this cluster. The valid format is a decimal (formatted to three decimal places).

Cluster Requests The number of requests for this cacheable object type made by cooperating caches in this cluster. The valid format is a positive integer.

Current Cache Size The current number of entries for this cacheable object type present in the dynamic cache. The valid format is a positive integer.

Disk Hit Rate (per sec) The rate (per second) of the requests for this cacheable object type served from disk during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Disk Hits The number of requests for this cacheable object type that were served from disk. This applies only when the disk offload is turned on for the dynamic cache. The valid format is a positive integer.

Explicit Disk Invalidations Rate (per sec) The rate at which the entries of this cacheable object type were removed from disk due to explicit invalidations issued by the clients. The valid format is a decimal (formatted to three decimal places).

Explicit Disk Invalidations The number of entries of this cacheable object type that were removed from disk due to explicit invalidations issued by the clients (directly accessing the application server and by remote JVMs in the cluster). The valid format is a positive integer.

Explicit Local Invalidation Rate (per sec) The rate at which the explicit invalidations were received for this cacheable object type from clients accessing the application server directly, either programmatically or by a cache policy. The valid format is a decimal (formatted to three decimal places).

Explicit Local Invalidations The number of explicit invalidations received for this cacheable object type from clients accessing the application server directly, either programmatically or by a cache policy. The valid format is a positive integer.

Explicit Memory Invalidation Rate (per sec) The rate at which the entries of this cacheable object type were removed from memory due to explicit invalidations issued by the clients. The valid format is a decimal (formatted to three decimal places).

Explicit Memory Invalidations The number of entries of this cacheable object type that were removed from memory due to explicit invalidations issued by the clients (directly accessing the application server and by remote JVMs in the cluster). The valid format is a positive integer.

Explicit Remote Invalidation Rate (per sec) The rate at which explicit invalidations were received for this cacheable object type from cooperating JVMs in the cluster. The valid format is a decimal (formatted to three decimal places).

Explicit Remote Invalidations The number of explicit invalidations received for this cacheable object type from cooperating JVMs in the cluster. The valid format is a positive integer.

Instrumentation Level The PMI instrumentation level set for collecting dynamic cache data. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Least Recently Used Invalidation Rate (per sec) The rate (per second) at which entries of this cacheable object type were evicted from memory by a least-recently used algorithm. The valid format is a decimal (formatted to three decimal places).

Least Recently Used Invalidations The number of entries of this cacheable object type that were evicted from memory by a least-recently-used algorithm. This happens when the in-memory cache becomes full and subsequent requests for new entries must be accommodated. The entries removed from memory are passivated to disk if disk overflow is enabled. If this number is high, consider increasing the in-memory cache size. The valid format is a positive integer.

Memory Hit Rate (per sec) The rate (per second) of the requests for this cacheable object type served from memory during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Memory Hits The number of requests for this cacheable object type served from memory. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Remote Cache Entries Received The number of entries received from cooperating dynamic caches in this cluster. The valid format is a positive integer.

Remote Cache Entry Receive Rate (per sec) The rate (per second) of entries received from cooperating dynamic caches in this cluster for the sampling interval. The valid format is a decimal (formatted to three decimal places).

Remote Hit Rate (per sec) The rate (per second) of the requests for this cacheable object type served from other JVMs in the cluster during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Remote Hits The requests for this cacheable object type served from other JVMs in the cluster. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 29. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the WebSphere application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Set Instrumentation Level Type Indicates the WebSphere resource category, which is used by the agent to modify the Instrumentation Level for transaction data collection.

Summary of Cache Templates Whether this row is a summary row of statistical totals collected for all the cache object types. The valid values are No and Yes.

Template Row Number The number of the row in the report that displays in the workspace, which is associated with a bar in the Ten Worst Hits Rate bar chart. The valid format is an integer.

Timeout Invalidation Rate (per sec) The rate (per second) at which entries are removed from the cache (memory or disk) because their timeout has expired. The valid format is a decimal (formatted to three decimal places).

Timeout Invalidations The number of entries of this cacheable object type that were removed from memory or disk because their timeout (as specified in the cache spec XML file) has expired. The valid format is a positive integer.

Total Explicit Invalidation Rate (per sec) The rate at which invalidations were issued for entries for this cacheable object type explicitly by the clients. The valid format is a decimal (formatted to three decimal places).

Total Explicit Invalidations The number of invalidations issued for entries of this cacheable object type explicitly by the clients (directly accessing the application server and by remote JVMs in this cluster). The valid format is a positive integer.

Total Hit Rate (per sec) The total hit rate per second. The valid format is a decimal (formatted to three decimal places).

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

EJB Containers attributes

The **EJB Containers** attributes provide aggregated information for each defined EJB container that aggregates bean performance data for all Enterprise beans deployed to that container.

The attributes also provide aggregated information for the application server that aggregates bean performance data for all Enterprise beans deployed to the application server. These attributes provide load values, response times, and lifecycle activities for Enterprise beans. Use the EJB Containers attributes in situations to monitor application server load and resource usage.

The attributes within this group are used to build the EJB Containers workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Activate Count The number of times a bean instance was activated during the interval. The valid format is a positive integer.

Activation Rate (per sec) The bean activations (per second) during the interval. The valid format is a decimal (formatted to three decimal places).

Active Method Count The average number of bean methods concurrently active during the interval. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Average Concurrently Live Beans The average number of bean objects concurrently live during the sampling interval. The valid format is a decimal

(formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Average Concurrently Ready Beans The average number of beans concurrently active during the last interval. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Container Name The name of the container. The valid format is an alphanumeric string, with a maximum of 64 characters.

Create Average Time (ms) The average method response time for creates during the interval. The valid format is a decimal (formatted to three decimal places).

Create Time Count The count of times that were averaged for Create Average Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Create Count The number of bean create calls during the interval. The valid format is a positive integer.

Creation Rate (per sec) The bean create calls (per second) during the interval. The valid format is a decimal (formatted to three decimal places).

Destroy Count The number of times bean objects were destroyed by garbage collection during the interval. The valid format is a positive integer.

Destruction Rate (per sec) The rate at which the beans are destroyed by garbage collection (per second) during the interval. The valid format is a decimal (formatted to three decimal places).

Entity Bean Load Count The number of times an entity bean data was loaded during the interval. The valid format is a positive integer.

Entity Bean Load Rate (per sec) The number of entity beans (per second) that were loaded during the interval. The valid format is a decimal (formatted to three decimal places).

Entity Bean Store Count The number of times entity bean data was written to the database during the interval. The valid format is a positive integer.

Entity Bean Store Rate (per sec) The entity bean stores (per second) during the interval. The valid format is a decimal (formatted to three decimal places).

Instantiate Count The number of times bean objects were instantiated during the interval. The valid format is a positive integer.

Instantiation Rate (per sec) The number of times bean objects were instantiated (per second) during the interval. The valid format is a decimal (formatted to three decimal places).

Instrumentation Level The instrumentation level for this EJB container. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Method Average Response Time (ms) The average response time (in milliseconds) on remote interface methods for all beans during the interval. The valid format is a decimal (formatted to three decimal places).

Method Response Time Count The count of bean response times averaged for Method Average Response Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Method Invocation Count The number of method invocations during the interval. The valid format is a positive integer.

Method Invocation Rate (per sec) The rate of invocations (per second) during the interval. The valid format is a decimal (formatted to three decimal places).

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Passivate Count The number of times a bean instance was passivated during the interval. The valid format is a positive integer.

Passivation Rate (per sec) The bean passivations (per second) during the interval. The valid format is a decimal (formatted to three decimal places).

Removal Rate (per sec) The bean remove calls (per second) during the interval. The valid format is a decimal (formatted to three decimal places).

Remove Average Time (ms) The average method response time for removes during the interval. The valid format is a decimal (formatted to three decimal places).

Remove Time Count The count of times that were averaged for Remove Average Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Remove Count The number of bean remove calls during the interval. The valid format is a positive integer.

Request Count The number of requests during the interval. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 30. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Set Instrumentation Level Type Indicates the WebSphere resource category, which is used by the agent to modify the Instrumentation Level for transaction data collection.

Summary of All Containers Whether this row is a summary row of statistical totals collected for all EJB containers. The valid values are No and Yes.

Total (ms) The total time used during the interval. The valid format is a decimal (formatted to three decimal places).

Total Create (ms) The total time (in milliseconds) of bean create calls during the interval. The valid format is a decimal (formatted to three decimal places).

Total Method Invocation (ms) The total time (in milliseconds) of method invocations during the interval. The valid format is a decimal (formatted to three decimal places).

Total Remove (ms) The total time (in milliseconds) of bean remove calls during the interval. The valid format is a decimal (formatted to three decimal places).

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Enterprise Java Beans attributes

The **Enterprise Java Beans** attributes provide performance information about each Enterprise Java Bean (EJB) deployed to the application server.

These attributes provide information about bean activity and bean object pool activity. Use the Enterprise Java Beans attributes in situations to monitor performance and problems for an individual bean. The attributes within this group are used to build the Enterprise Java Beans workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and reselect it later. Each time you reselect the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Activate Count The number of times a bean instance was activated during the interval. The valid format is a positive integer.

Activation Rate (per sec) The bean instance activations (per second) during the interval. The valid format is a decimal (formatted to three decimal places).

Active Method Count The average number of invocations being processed concurrently for all the methods during the interval. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Application EJB Module Name The name of the Web Application or EJB Module. The valid format is an alphanumeric string, with a maximum of 64 characters.

Average Concurrently Live Beans The average number of live bean objects during the interval, which include objects that were instantiated but not yet destroyed. This is a load value providing data on the average level as a function of time. It is the average number of bean objects that exist in the run time, whether active or pooled. This is a measure of how many resources the home interface is consuming. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Average Concurrently Ready Beans The average number of active beans during the interval. This is a load value providing data on the average level as a function of time. It is the average number of bean instances of the home that are in the ready state. This is a measure of how busy the server is. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Average Objects Discarded The average number of objects that were discarded each time the bean object pool was emptied of idle objects during the interval. The valid format is a decimal (formatted to three decimal places).

Objects Discarded Count The count of objects used for Average Objects Discarded. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Average Objects in Pool The average number of objects in the bean object pool during the interval. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Bean Name The name of the Enterprise JavaBean (EJB). This name prefixes the application name and the EJB compress name. The valid format is an alphanumeric string, with a maximum of 128 characters.

Bean Type The type of bean. Valid values are Stateless, Stateful, Entity, and Message Driven.

Create Average Time (ms) The average method response time to create bean objects during the interval. The valid format is a decimal (formatted to three decimal places).

Create Time Count The count of times that were averaged for Create Average Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Create Count The number of create calls during the interval. The valid format is a positive integer.

Creation Rate (per sec) The create calls (per second) during the interval. The valid format is a decimal (formatted to three decimal places).

Destroy Count The average number of times bean objects were destroyed by garbage collection during the interval. The valid format is a positive integer.

Destruction Rate The rate of destructions (per second) for bean objects by the garbage collector during the interval. The valid format is a decimal (formatted to three decimal places).

Discard Count The number of times the returned object to the bean object pool was discarded because the bean object pool was already full during the interval. The valid format is a positive integer.

Discard Rate (per sec) The bean object pool discards (per second) during the interval. The valid format is a decimal (formatted to three decimal places).

Drain Count The number of times the bean object pool was found idle and an attempt was made to remove idle objects during the interval. The valid format is a positive integer.

Drain Rate (per sec) The drain rate (per second) for the bean object pool during the interval. The valid format is a decimal (formatted to three decimal places).

Entity Bean Load Count The number of times bean data was loaded during the interval. The valid format is a positive integer.

Entity Bean Load Rate (per sec) The bean data loads (per second) during the interval. The valid format is a decimal (formatted to three decimal places).

Entity Bean Store Count The number of times bean data was written to the database during the interval. The valid format is a positive integer.

Entity Bean Store Rate (per sec) The rate at which data was written (per second) to the database for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Find Count The number of times a retrieval call found an object available in the bean object pool during the interval. The valid format is a positive integer.

Find Rate (per sec) The bean object pool retrieve availability (per second) for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Get Count The number of calls that retrieved an object from the bean object pool during the interval. The valid format is a positive integer.

Get Rate (per sec) The number of times bean objects were retrieved (per second) during the interval. The valid format is a decimal (formatted to three decimal places).

Instantiate Count The number of times bean objects were created during the interval. The valid format is a positive integer.

Instantiation Rate (per sec) The bean objects created (per second) for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Instrumentation Level The instrumentation level of this enterprise bean. The valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Bean Object Pool Instrumentation Level The instrumentation level of the object pool for this enterprise bean. The valid values are None, Low, Medium, High, Basic, Extended, All, Custom, Maximum.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Method Average Response Time (ms) The average response time (in milliseconds) for all methods of the remote interface for this bean during the interval. The valid format is a decimal (formatted to three decimal places).

Method Response Time Count The count of times that were averaged for Method Average Response Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Method Invocation Rate (per sec) The invocations (per second) for all methods during the sampling interval. The Method Invocation Rate (per sec) is a load value that provides data on the average level as a function of time. This is a measure of how busy the server is. The valid format is a decimal (formatted to three decimal places).

Method Invocations The total number of remote interface method invocations during the interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Passivate Count The average number of bean objects passivated during the sampling interval. Minimum instrumentation level required to collect these data: Extended. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Passivation Rate (per sec) The number of passivations (per second) during the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Removal Rate (per sec) The remove calls (per second) for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Remove Average Time (ms) The average method response time to remove bean objects during the interval. The valid format is a decimal (formatted to three decimal places).

Remove Time Count The count of times that were averaged for Remove Average Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Remove Count The number of remove calls during the interval. The valid format is a positive integer.

Return Count The number of calls that returned an object to the bean object pool during the interval. The valid format is a positive integer.

Return Rate (per sec) The bean object pool returns (per second) for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 31. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute

Table 31. Format of the 12-character timestamp (continued)

Character String	Meaning
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Set Instrumentation Level Type Indicates the WebSphere resource category, which is used by the agent to modify the Instrumentation Level for transaction data collection.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Garbage Collection Analysis attributes

The **Garbage Collection Analysis** attribute group provides information about the garbage collector in the Java Virtual Machine that is hosting the application server.

The garbage collection attributes report the number of times the collector ran during the interval and the resulting number of objects that the collector freed. Use the Garbage Collection Analysis attributes in situations to monitor garbage-collection performance and possible problems. The attributes within this group are used to build the Garbage Collection Analysis and the WebSphere application server workspaces.

ASID The identifier (decimal) assigned to the address space running this servant region.

GC Rate (per min) The rate (per minute) at which the Java Virtual Machine is invoking its garbage-collection routine. The valid format is a decimal (formatted to three decimal places).

Heap Used (%) The percentage of heap used at the end of the interval. The valid format is a decimal (formatted to one decimal place).

Max Heap KBytes The maximum heap size for the JVM (the -Xmx parameter, if specified) The valid format is a 4-byte integer.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Kbytes Free The total number of free kilobytes in the heap at the end of the last garbage-collection cycle during the interval. The valid format is a positive integer.

Kbytes Total Freed by GC The total number of kilobytes freed by the garbage collector during the interval. The valid format is a positive integer.

Kbytes Used The number of kilobytes in the heap that were in use at the end of the last garbage collection cycle during the interval. The valid format is a positive integer.

Kbytes Used Delta The difference between the Kbytes Used value for this interval and the Kbytes Used value for the prior interval. The valid format is a positive or negative integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Objects Freed The number of objects the garbage collector freed during the interval (only supported for IBM JDK). The valid format is a positive integer. Not monitored on non-IBM Java Virtual Machines, including objects commonly used on HP-UX and Solaris platforms.

Objects Moved The number of objects the garbage collector moved during the interval (only supported for IBM JDK). The valid format is a positive integer. Not monitored on non-IBM Java Virtual Machines, including objects commonly used on HP-UX and Solaris platforms.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The unique identifier of the JVM process (the class ID of the JVM). The valid format is a positive integer.

Real Time (ms) The total real time (in milliseconds) the garbage collector required during the most recent cycle. The valid format is a positive integer.

Real Time (%) The percentage of real time that the garbage collector was active during the interval. The valid format is a decimal (formatted to one decimal place).

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 32. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the WebSphere application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Indicates that this row is a summary row of statistical totals for all rows.

Times Run The number of times the garbage collector ran during the interval. The valid format is a positive integer.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Garbage Collection Cycle attributes

The **Garbage Collection Cycle** attribute group provides information about a single garbage-collection cycle that the Java Virtual Machine hosting the application server performed.

The Garbage Collection Cycle attributes report the free heap space both before and after garbage collection, the heap space freed, and the number of objects moved during garbage collection. Use the Garbage Collection Cycle attributes in situations to examine the results of a particular garbage collection.

The attributes within this group are used to build the Garbage Collections - Selected Allocation Failure workspace.

Important: This information is only collected for systems using an IBM JVM.

Allocation Failure Number The identifier assigned to the allocation-failure block for which the JVM ran the current garbage-collection cycle, which is associated with a bar in the Heap Usage - History bar chart. If your Java code called System.gc to start garbage collection, this number is 0. The valid format is a positive integer.

ASID The identifier (decimal) assigned to the address space running this servant region.

Compact (ms) The time (in milliseconds) required for the compaction phase of the garbage-collection cycle. The valid format is a positive integer.

Compaction Reason The code describing the reason garbage collection was initiated. The valid format is a positive integer. The compaction codes are:

Table 33. Reasons for initiating garbage collection

Compaction Code	Definition
1	Insufficient free space for the allocation request following the mark and sweep phases.
2	The heap is fragmented and benefits from a compaction.
3	Less than 15% free space available.
4	A call to System.gc requested garbage collection.

Table 33. Reasons for initiating garbage collection (continued)

Compaction Code	Definition
5	Less than 5% free space available.
6	Less than 128 K free space available.
7	Parameter Xcompactgc specified.
8	The transient heap has less than 5% free space available.
9	The heap is fragmented (this code marks additional reasons for compaction apart from compaction code 2).

Final References The number of final reference objects collected during this garbage-collection cycle. The valid format is a positive integer.

Garbage Collection Date and Time The date and time the Java Virtual Machine invoked the garbage collector. The valid format is a 16-character timestamp. This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Note to Solaris and HP-UX users: Since allocation-failure information is not recorded on these platforms, this column is always empty on these platforms.

Garbage Collection Number The number of this garbage-collection cycle. The valid format is a positive integer.

Heap Capacity (Kbytes) The total number of kilobytes allocated to the main heap after this garbage-collection cycle. The valid format is a positive integer.

Heap Free (%) after GC The percentage of heap space that is available after this garbage-collection cycle. The valid format is a decimal (formatted to one decimal place).

Heap Space Free (Kbytes) The number of kilobytes available within the heap after this garbage-collection cycle. The valid format is a positive integer.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

KBytes Free at Start of GC The number of kilobytes available in the heap before garbage collection began. The valid format is a positive integer.

Kbytes Freed The number of kilobytes freed by the garbage collector. The valid format is a positive integer.

Kbytes Moved The number of kilobytes moved on the heap during this compaction. The valid format is a positive integer.

Kbytes Used The number of kilobytes in the heap that were in use after this garbage-collection cycle. The valid format is a positive integer.

Mark (ms) The time (in milliseconds) required for the mark phase of the garbage-collection cycle. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Objects Moved The number of objects the garbage collector moved during this compaction. The valid format is a positive integer.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Phantom References The number of phantom reference objects collected during this garbage-collection cycle. "Phantom" refers to a specific Java class that defines object reachability. The valid format is a positive integer.

Process ID The unique identifier of the JVM process (the class ID of the JVM). The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 34. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the WebSphere application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Soft References The number of soft reference objects collected during this garbage-collection cycle. "Soft" refers to a specific Java class that defines object reachability. The valid format is a positive integer.

Sweep (ms) The time (in milliseconds) required for the sweep phase of the garbage-collection cycle. The valid format is a positive integer.

Time to Complete (ms) The time (in milliseconds) required to complete this garbage-collection cycle. The valid format is a positive integer.

Weak References The number of weak reference objects collected during this garbage-collection cycle. "Weak" refers to a specific Java class that defines object reachability. The valid format is a positive integer.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

High Availability Manager attributes

The **High Availability Manager** attributes provide aggregated information about the high availability managers.

The attributes within this group are used to build the High Availability Manager workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and then select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Bulletin-Board Rebuild Time The time taken (in milliseconds) to rebuild the global state of the bulletin-board. During this time no messages are received by the subscribers. If this time is too high, and is unacceptable, you might want to increase the number of coordinators. The valid format is a decimal (formatted to three decimal places).

Bulletin-Board Rebuild Time Count The count of times that were used for Bulletin-Board Rebuild Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Bulletin-Board Subjects The total number of subjects managed. The valid format is a positive integer. This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Bulletin-Board Subscriptions The total number of bulletin-board subscriptions. The valid format is a positive integer. This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Group State Rebuild Time The time taken (in milliseconds) to rebuild the global group state. During the rebuild time, no fail-over can happen. If this time is too high and is unacceptable for the desired availability, you might want to increase the number of coordinators. For proper operation of this counter, you must host the active coordinator in an application server other than the deployment manager. The valid format is a decimal (formatted to three decimal places).

Group State Rebuild Time Count The count of times that were used for Group State Rebuild Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Instrumentation Level The instrumentation level for availability manager counters. For WebSphere 5, the valid values are None, Low, Medium, High, and Maximum; for WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Local Bulletin-Board Subjects The total number of subjects being posted locally. The number includes the proxy postings (if any) done by the core group bridge service on behalf of servers belonging to different WebSphere cells. The valid format is a positive integer. This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Local Bulletin-Board Subscriptions Indicates the total number of bulletin-board subscriptions being posted locally.

Local Groups The total number of local groups. The valid format is a positive integer. This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Row Number The row number. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 35. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Whether this row is a summary row of statistical totals for all rows. Valid values are No and Yes.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

J2C Connection Pools attributes

The **J2C Connection Pools** attribute group provides information about connectors that adhere to J2C, the WebSphere application server implementation of the J2C architecture.

Data counters for this category contain usage information about the J2C architecture that enables enterprise beans to connect and interact with procedural backend systems, such as Customer Information Control System (CICS) and Information Management System (IMS). Examples include the number of managed connections or physical connections and the total number of connections or connection handles.

The attributes within this group are used to build the J2C Connection Pools workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Application ID Indicates JEE application ID.

Average Free Connections The average number of free Managed Connections for the interval. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Average Pool Size The average number of Managed Connections for the interval. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Average Usage Time (ms) The average time (in milliseconds) that connections are in use (measured from when the connection is allocated to when it is returned). The valid format is a decimal (formatted to three decimal places).

Usage Time Count The count of times that were averaged for Average Usage Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Average Wait Time (ms) The average waiting time (in milliseconds) until a connection is granted for the interval. The valid format is a decimal (formatted to three decimal places).

Wait Time Count The count of times that were averaged for Average Wait Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Concurrent Waiting Threads The average number of threads concurrently waiting for a connection for the interval. The valid format is a positive integer. This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Connection Allocation Rate (per sec) The rate (per second) of application connections allocated from Managed Connections for the sampling interval. The valid format is a decimal (formatted to three decimal places).

Connection Creation Rate (per sec) The rate (per second) of Managed Connections created for the sampling interval. The valid format is a decimal (formatted to three decimal places).

Connection Destruction Rate (per sec) The rate (per second) of Managed Connections destroyed for the sampling interval. The valid format is a decimal (formatted to three decimal places).

Connection Factory Name The name of the connection factory. The valid format is an alphanumeric string, with a maximum of 256 characters.

Connection Handles The number of open application connections that have been allocated from the managed connections. The valid format is a positive integer.

Connection Pool Timeout Rate (per sec) The rate (per second) of connection pool timeouts for the sampling interval. The valid format is a decimal (formatted to three decimal places).

Connection Pool Timeouts The number of faults, such as timeouts, in connection pools for the sampling interval. The valid format is a positive integer.

Connection Return Rate (per sec) The rate (per second) of allocated application connections that have been returned for the sampling interval. The valid format is a decimal (formatted to three decimal places).

Connection Type The J2C connection type. The valid format is an alphanumeric string, with a maximum of 32 characters.

Connections Allocated The number of application connections allocated from Managed Connections. The valid format is a positive integer.

Connections Created The total number of Managed Connections created during the sampling interval. The valid format is a positive integer.

Connections Destroyed The number of Managed Connections destroyed during the sampling interval. The valid format is a positive integer.

Connections Granted The number of Managed Connections granted during the interval. The valid format is a positive integer.

Connections Returned The number of allocated application connections that have been returned (closed) during the sampling interval. The valid format is a positive integer.

Connections Used The number of Managed Connection objects available in a particular connection pool. This number includes all Managed Connection objects that have been created but not destroyed. The valid format is a positive integer.

Factory Label The abbreviated name of the connection factory. The valid format is an alphanumeric string, with a maximum of 32 characters.

Instrumentation Level The instrumentation level for the J2C connection pools. For WebSphere 5, the valid values are None, Low, Medium, High, and Maximum; for WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval Time The length (in seconds) of the sampling interval. The valid format is a positive integer.

Maximum Pool Size The maximum number of managed connections that can be created in this connection pool (blank for each individual managed connection). The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Percent of Time Pool at Max The average percent of the time that all connections are in use for the interval. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Percent Used Bad The bad percent of pool usage by application. The valid format is a positive integer.

Percent Used Fair The fair percent of pool usage by application. The valid format is a positive integer.

Percent Used Good The good percent of pool usage by application. The valid format is a positive integer.

Pool Used (%) The average percent of the pool that is in use for the interval. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Row Number The number of the row within the report, which corresponds to a bar in the Highest Miss Rates bar chart. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 36. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the WebSphere application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Set Instrumentation Level Type Indicates the WebSphere resource category, which is used by the agent to modify the Instrumentation Level for transaction data collection.

Summary of J2C Connections Whether this row is a summary row of statistical totals collected for all the J2C connection pools. Valid values are No and Yes.

Total Usage (ms) The total time (in milliseconds) the connection object used. The valid format is a decimal (formatted to three decimal places).

Total Wait (ms) The total time (in milliseconds) the connection object waited. The valid format is a decimal (formatted to three decimal places).

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

JMS Summary attributes

The **JMS Summary** attributes provide information about how WebSphere application server applications are interacting with messaging middleware (WebSphere MQ) using the Java Messaging Service (JMS). It provides such information as which queue managers and queues are being used and how many messages are being read and written.

The attributes within this group are used to build the JMS Summary workspace.

Important: The attributes within this attribute group contain meaningful values only if your site has set the request data monitoring level to Level2 to collect data on JMS requests.

Application ID The unique identifier that is assigned automatically when the application is first configured and is preserved during the whole application life cycle. The valid format is a positive integer or -1 which means that Application ID is aggregated statistic for all applications.

ASID The identifier (decimal) assigned to the address space running this servant region.

Average Processing Time (ms) The average time (in milliseconds) per request using the JMS. The valid format is a decimal (formatted to three decimal places).

Processing Time Count The count of times that were averaged for Average Processing Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Browse Average Time (ms) The average time (in milliseconds) for each browse request from the queue. The valid format is a decimal (formatted to three decimal places).

Browse Count The number of messages browsed from the queue. The valid format is a positive integer.

Browse Rate (per sec) The number of messages (per second) browsed from a JMS queue. The valid format is a decimal (formatted to three decimal places).

Browse Total Time (ms) The total time (in milliseconds) consumed by browse requests from the queue. The valid format is a positive integer.

Full Name The complete name of the message queue, which consists of the queue manager name concatenated to the queue name and separated by a slash. The valid format is an alphanumeric string, with a maximum of 100 characters.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

JMS Connection Label A shortened version of the full name. The valid format is an alphanumeric string, with a maximum of 12 characters.

Manager Name The name of the WebSphere MQ queue manager (not available currently). This attribute is blank if WebSphere MQ is not being used. The valid format is an alphanumeric string, with a maximum of 48 characters.

Name The name of the WebSphere MQ queue. The valid format is an alphanumeric string, with a maximum of 48 characters.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Origin Node The name of the application server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The unique identifier of the JVM process (the class ID of the JVM). The valid format is a positive integer.

Publish Average Time (ms) The average time (in milliseconds) for each publish request to be sent to the queue. The valid format is a decimal (formatted to three decimal places).

Publish Count The number of publish requests sent to the queue. The valid format is a positive integer.

Publish Rate (per sec) The number of publish requests (per second) sent to a JMS queue. The valid format is a decimal (formatted to three decimal places).

Publish Total Time (ms) The total time (in milliseconds) consumed by all publish requests for the queue. The valid format is a positive integer.

Receive Average Time (ms) The average time (in milliseconds) for each get from the queue. The valid format is a decimal (formatted to three decimal places).

Receive Count The number of destructive gets from the queue. The valid format is a positive integer.

Receive Rate (per sec) The number of destructive gets (per second) made from the queue. The valid format is a decimal (formatted to three decimal places).

Receive Total Time (ms) The total time (in milliseconds) consumed by gets from the queue. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 37. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Send Average Time (ms) The average time (in milliseconds) for each put to the queue. The valid format is a decimal (formatted to three decimal places).

Send Count The number of messages put to the queue. The valid format is a positive integer.

Send Rate (per sec) The number of messages (per second) put to the queue. The valid format is a decimal (formatted to three decimal places).

Send Total Time (ms) The total time (in milliseconds) consumed by puts to the queue. The valid format is a positive integer.

Server Name The name of the WebSphere application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Indicates that this row is a summary row of statistical totals for all rows.

Total Time (ms) The total time (in milliseconds) spent accessing the queue. The valid format is a positive integer.

Type The type of message manager. The valid values are Queue and Topic.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Log Analysis attributes

The **Log Analysis** attributes provide application server error and exception conditions which are recorded in the application server log files.

The log files are SystemOut.log and SystemErr.log. Use the Log Analysis attributes in situations to monitor errors and exception conditions and their severity.

The attributes within this group are used to build the Log Analysis workspace.

ASID The identifier (decimal) assigned to the address space running this servant region.

Component The name of the component that caused the error. The valid format is an alphanumeric string, with a maximum of 32 characters.

Error Date and Time The date and time the event occurred. The valid format is a timestamp. This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Job ASID The identifier (hexadecimal) assigned to the address space running this servant region. The valid format is an alphanumeric string, with a maximum of four characters.

Job Name The job name assigned to this servant region. The valid format is an alphanumeric string, with a maximum of eight characters.

Message ID The identifier assigned to the message. The valid format is an alphanumeric string, with a maximum of 12 characters.

Message Origin Where the message originates; that is, the log file name and line number. The valid format is an alphanumeric string, with a maximum of 32 characters. This field is not empty only on the z/OS system.

Message Text The text of the message. The valid format is alphanumeric string, with a maximum of 256 characters. All error message text data that goes beyond 256 characters are truncated and are not shown in the portal.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The process identifier of the Java virtual machine. The valid format is an alphanumeric string, with a maximum of eight characters. In a z/OS system, this field displays in hexadecimal format.

Sequence Number The sequence number in the JMX notifications stream. The valid format is positive integer.

Server Instance Name The name of the application server instance. This is the name of a single address space that can run application code (called a "specific server" or simply a "server"). The valid format is an alphanumeric string, with a maximum of eight characters.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Severity The severity of the message. The valid values are:

Table 38. Message severities and their meanings

Severity	Definition
Informational	A message intended to convey only user information
Unconditional	A message of type Unconditional
Dump	A message of type Dump
SystemOut	A message written directly to System.out by the user application or internal components
SystemError	A message written directly to System.err by the user application or internal components
User	A message of type User
EntryMethod	A message written upon entry to a method
ExitMethod	A message written upon exit from a method
Event	A message of type Event
Debug	A message of type Debug
Audit	An audit message

Table 38. Message severities and their meanings (continued)

Severity	Definition
Warning	A warning message
Error	An error message
Terminate	A message of type Terminate (exit process)
Fatal	A fatal message
Unknown	A placeholder that indicates the message type was not recognized

Thread ID The unique identifier of the thread where the event occurred. The valid format is an alphanumeric string, with a maximum of 16 characters.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Listener Port attributes

Origin Node The server name subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Sample Date and Time The date and time at which the agent has collected data.

Interval Time Indicates the length of the interval in seconds. The valid format is a 4-byte integer.

Name Name of the Listener Port. The valid format is an alphanumeric string, with a maximum of 256 characters.

Status The status of the Listener Port: Started or Stopped.

JMS Connection Factory The JNDI name for the JMS ConnectionFactory in use by this Listener Port. The valid format is an alphanumeric string, with a maximum of 256 characters.

JMS Destination The JNDI name for the JMS Queue or Topic in use by this Listener Port. The valid format is an alphanumeric string, with a maximum of 256 characters.

Max Sessions The value of max sessions in use by this Listener Port. The valid format is a 4-byte integer.

Max Retries The value of max retries in use by this Listener Port. The valid format is a 4-byte integer.

Max Messages The value of max messages in use by this Listener Port. The valid format is a 4-byte integer.

Messaging Engine Communications attributes

The **Messaging Engine Communications** attributes display statistics for all the messaging engines being hosted by the current application server.

The attributes within this group are used to build the Messaging Engine Communications workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.
- Attributes in this group are only provided for IBM WebSphere application server version 6.0 or later.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

API Connections The number of sessions being used by messaging engines that are currently network connected to this application server. The valid format is a positive integer.

Buffered Reads (bytes) The number of bytes of data that have been received from the network and are held pending further processing. Large values might indicate that the application server is unable to process data fast enough to keep up with the other application server processes hosting messaging engines. The valid format is a positive integer.

Buffered Writes (bytes) The number of bytes of data being held pending transmission. Large values might indicate network congestion or application server processes hosting messaging engines which are unable to process data fast enough to keep up with the application server. The valid format is a positive integer.

Errors The communication errors that have occurred and resulted in a network connection to a messaging engine being disconnected. The valid format is a positive integer.

Instrumentation Level The instrumentation level for the Messaging Engine Communications. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Message Read (bytes) The number of bytes of message data received from application server processes hosting messaging engines over network connections. This does not include data used to negotiate the transmission of messages. The valid format is a positive integer.

Message Written (bytes) The number of bytes of message data sent to application server processes hosting messaging engines over network connections. This does not include data used to negotiate the transmission of messages. The valid format is a positive integer.

Messaging Engine Attached The number of distinct application server processes hosting messaging engines currently network connected to this application server. The valid format is a positive integer.

Messaging Engine Name The name of the message engine. The value format is an alphanumeric string, with a maximum of 256 characters.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Reads The number of read operations used to receive data from application server processes hosting messaging engines via network connections. The valid format is a positive integer.

Reads Blocked The number of read operations that could not be completed immediately. This number can be used as an indicator of network congestion when communicating with application server processes hosting messaging engines. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 39. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Whether this row is a summary row of statistical totals for all messaging engine communications. Valid values are No and Yes.

Total Read (bytes) The Number of bytes of data received from application server processes hosting messaging engines. The valid format is a positive integer.

Total Written (bytes) The Number of bytes of data sent to application server processes hosting messaging engines. The valid format is a positive integer.

Writes The number of write operations used to transmit data to application server processes hosting messaging engines via network connections. The valid format is a positive integer.

Writes Blocked The number of write operations that could not be completed immediately. This number can be used as an indicator of network congestion when communicating with application server processes hosting messaging engines. The valid format is a positive integer.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Messaging Engines attributes

The **Messaging Engines** attributes display aggregated information about the performance of the messaging engines supported by WebSphere server.

The attributes within this group are used to build the Messaging Engines workspace.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Important: Attributes in this group are only provided for IBM WebSphere application server version 6.0 or later.

Average Local Wait Time (ms) The time spent by messages on this durable subscription at consumption. If this time is not what was expected, view the message using the admin console to decide what action needs to be taken. The valid format is a positive integer.

Local Wait Time Count The count of times that were averaged for Average Local Wait Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Expired Messages The number of report enabled messages that expired while on this queue. The valid format is a positive integer.

Incomplete Topic Publications The number of publications not yet received by all current subscribers. If this number is unexpected, view the publication using the admin console to take action. The valid format is a positive integer.

Instrumentation Level The instrumentation level for the messaging engines. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Messaging Engine Name The name of the messaging engine. The valid format is an alphanumeric string, with a maximum of 256 characters.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 40. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Status The status of the messaging engine. The valid format is a positive integer.

Summary of All Applications Whether this row is a summary row of statistical totals for all messaging engines. Valid values are No and Yes.

Total Published The total number of publications to the messaging engines. The valid format is a positive integer.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Portal Page Summary attributes

The **Portal Page Summary** attributes provide information about response times statistics for all portal page requests that completed on monitored WebSphere Portal server during the interval.

The attributes within this group are used to build the Portal Pages Summary workspace.

ASID The identifier (decimal) assigned to the address space running this servant region.

Average Response Time (ms) The average response time (in milliseconds) of requests are processed by the portal pages during the current interval. The valid format is a decimal (formatted to three decimal places).

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The unique identifier of the JVM process (the class ID of the JVM). The valid format is a positive integer.

Portal Page Name The name of the portal page. The value format is an alphanumeric string, with a maximum of 128 characters.

Request Count The count of requests processed by the portlet page during the current interval. The valid format is a positive integer.

Row Number The number of the row. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 41. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Indicates that this row is a summary row of statistical totals for all rows.

Total Response (ms) The total time (in milliseconds) of responses. The valid format is a decimal (formatted to three decimal places).

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Portal Summary attributes

The **Portal Summary** attributes provide aggregated response times statistics about all portal pages and portlet requests that completed on monitored WebSphere Portal server during the interval.

The attributes within this group are used to build the Portal Summary workspace.

ASID The identifier (decimal) assigned to the address space running this servant region.

Authentication Request Count The number of authentication requests during the interval. The valid format is a positive integer.

Authentication Total (ms) The total time (in milliseconds) of authentication requests completed during the interval. The valid format is a decimal (formatted to three decimal places).

Authorization Request Count The number of authorization requests during the interval. The valid format is a positive integer.

Authorization Total (ms) The total time (in milliseconds) of authorization requests completed during the interval. The valid format is a decimal (formatted to three decimal places).

Average Response Time of Portal Pages (ms) The average response time (in milliseconds) of all portal pages/Gateway Servlet requests completed during the interval. The valid format is a decimal (formatted to three decimal places).

Average Response Time of Portlets (ms) The average response time (in milliseconds) of all portlets requests completed during the interval. The valid format is a decimal (formatted to three decimal places).

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Model Building Request Count The number of model building requests during the interval. The valid format is a positive integer.

Model Building Total (ms) The total time (in milliseconds) of model building requests completed during the interval. The valid format is a decimal (formatted to three decimal places).

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Page Loading Request Count The number of page loading requests during the interval. The valid format is a positive integer.

Page Loading Total (ms) The total time (in milliseconds) of page loading requests completed during the interval. The valid format is a decimal (formatted to three decimal places).

Portal Page Request Count The number of portal page requests during the interval. The valid format is a positive integer.

Portal Pages Total Response (ms) The total response time (in milliseconds) of all portal pages/Gateway Servlet requests completed during the interval. The valid format is a decimal (formatted to three decimal places).

Portlets Request Count The number of portlets requests during the interval. The valid format is a positive integer.

Process ID The unique identifier of the JVM process (the class ID of the JVM). The valid format is a positive integer.

Portlets Total Response(ms) The total response time (in milliseconds) of all portlets requests completed during the interval. The valid format is a decimal (formatted to three decimal places).

Response Time of Authentication (ms) The response time (in milliseconds) of authentication. The valid format is a positive integer.

Response Time of Authorization (ms) The response time (in milliseconds) of authorization. The valid format is a positive integer.

Response Time of Model Building (ms) The response time (in milliseconds) of model building. The valid format is a positive integer.

Response Time of Page loading (ms) The response time (in milliseconds) of page loading. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 42. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Indicates that this row is a summary row of statistical totals for all rows.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Portlet Summary attributes

The **Portlet Summary** attributes provide information about response times of all portlet requests that completed on monitored WebSphere Portal.

The attributes within this group are used to build the Portlet Summary workspace.

ASID The identifier (decimal) assigned to the address space running this servant region.

Average Response Time (ms) The average response time for portlet during the current interval. The valid format is a decimal (formatted to three decimal places).

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Portlet Name The name of the portlet. The value format is an alphanumeric string, with a maximum of 256 characters.

Process ID The unique identifier of the JVM process (the class ID of the JVM). The valid format is a positive integer.

Request Count The count of requests for portlet during the current interval. The valid format is a positive integer.

Request Rate The rate at which the requests processed by portlet during the current interval. The valid format is a decimal (formatted to three decimal places).

Row Number The number of the row. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 43. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Indicates that this row is a summary row of statistical totals for all rows.

Total Response (ms) The total response time for portlet during the current interval. The valid format is a decimal (formatted to three decimal places).

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Queue attributes

The **Queue** attributes provide aggregated information about the point to point messaging.

The attributes within this group are used to build the Destinations workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.
- Attributes in this group are only provided for IBM WebSphere application server version 6.0 or later.

Aggregate Message Wait Time The time spent by messages in the bus at consumption. If this time is not what was expected, view the message using the admin console to decide what action needs to be taken. The valid format is a positive integer.

Aggregate Message Wait Time Count The count of times that were used for Aggregate Message Wait Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Assured Persistent Messages Consumed The number of assured persistent messages consumed, for the lifetime of this messaging engine. The valid format is a positive integer.

Assured Persistent Messages Produced The number of assured persistent messages produced, for the lifetime of this messaging engine. The valid format is a positive integer.

Available Message The number of messages available for a queue for consumption. If this number is close to the destination high messages value, review the high messages value. The valid format is a positive integer.

Best Effort Non-persistent Messages Consumed The number of best effort non-persistent messages consumed, for the lifetime of this messaging engine. The valid format is a positive integer.

Best Effort Non-persistent Messages Produced The number of best effort non-persistent messages produced, for the lifetime of this messaging engine. The valid format is a positive integer.

Express Non-persistent Messages Consumed The number of express non-persistent messages consumed, for the lifetime of this messaging engine. The valid format is a positive integer.

Express Non-persistent Messages Produced The number of express non-persistent messages produced, for the lifetime of this messaging engine. The valid format is a positive integer.

Instrumentation Level The instrumentation level for the database connection pool for the data source. Valid values are None, Low, Medium, High, Basic, Extended, All, Custom, and Maximum. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Local Consumer The number of currently attached local consumers. The valid format is a positive integer.

Local Consumer Attaches The number of times an attachment has been made to this queue by local consumers. The lifetime of this value is the lifetime of the messaging engine. The valid format is a positive integer.

Local Message Wait Time The time spent by messages on this queue at consumption. If this time is not what was expected, view the message using the admin console to decide what action needs to be taken. The valid format is a positive integer.

Local Message Wait Time Count The count of times that were used for Local Message Wait Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Local Oldest Message Age The longest time any message has spent on this queue. If this time is not what was expected, view the message using the admin console to decide what action needs to be taken. The valid format is a positive integer.

Local Producer The number of currently attached local producers. The valid format is a positive integer.

Local Producer Attaches The number of times an attachment has been made to this queue by local producers. The lifetime of this value is the lifetime of the messaging engine. The valid format is a positive integer.

Messaging Engine Name The name of the messaging engine. The value format is an alphanumeric string, with a maximum of 256 characters.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Queue Name The name of the queue. The value format is an alphanumeric string, with a maximum of 256 characters.

Reliable Non-persistent Messages Consumed The number of reliable non-persistent messages consumed, for the lifetime of this messaging engine. The valid format is a positive integer.

Reliable Non-persistent Messages Produced The number of reliable non-persistent messages produced, for the lifetime of this messaging engine. The valid format is a positive integer.

Reliable Persistent Messages Consumed The number of reliable persistent messages consumed, for the lifetime of this messaging engine. The valid format is a positive integer.

Reliable Persistent Messages Produced The number of reliable persistent messages produced, for the lifetime of this messaging engine. The valid format is a positive integer.

Report Enabled Messages Expired The number of report enabled messages that expired while on this queue. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 44. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day

Table 44. Format of the 12-character timestamp (continued)

Character String	Meaning
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Whether this row is a summary row of statistical totals for all rows. Valid values are No and Yes.

Total Messages Consumed The total number of messages consumed from this queue, for the lifetime of this messaging engine. The valid format is a positive integer.

Total Messages Produced The total number of messages produced to this queue, for the lifetime of this messaging engine. The valid format is a positive integer.

Unavailable Message The number of messages locked or uncommitted. This means messages that have been added or removed but the transaction has not been committed yet. If this number is high, check which messages are locked and why.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Remote Configuration Requests attributes

The **Remote Configuration Requests** attributes provide information about remote configuration.

The attributes within this group are used to build the WebSphere Agent workspace.

Command Indicates the Command of the request.

Node Name The system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Origin Node The server name subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Identifier The Request ID. The valid format is an alphanumeric string, with a maximum of 48 characters.

Package Count Indicates the package count for this request/response.

Package Index Indicates the current index of the packages.

Request Context Indicates the request context.

Response Context Indicates the response context.

Return Value Indicates the return value of the request.

Target Agent Code Two-letter agent product code that specifies information about the product being configured.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Request Analysis attributes

The **Request Analysis** attributes provide response times and functional decomposition information about requests (servlets, JSPs, SCA requests, Portal requests, EJB methods, and web services) that ran on the application server.

The attributes within this group are used to build the Request Analysis workspace.

Application Name The name of the application to which the request belongs. The valid format is an alphanumeric string, with a maximum of 256 characters.

Important: The application name is, in the present version, not provided for SCA requests.

Application Time (ms) On monitoring level 1, the average time (in milliseconds) this request spent processing application requests other than JCA, JMS, JNDI, JDBC, web service, and SCA requests. This field can have a zero value if the total time is less than the number of requests, due to truncation. On monitoring level 2, the average time (in milliseconds) this request spent processing Servlet and EJB requests. The valid format is a positive integer.

Application Time Count The count of times that were averaged for Application Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Application Time Percent The percentage of time this request spent processing application requests other than JCA, JMS, JNDI, JDBC requests, web services, and SCA. The valid format is a decimal (formatted to one decimal place).

Application Time Percent Count The count of individual percentages that were averaged for Application Time Percent. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Application Bad Delay (msec) The delay time (in milliseconds) in the application tier collected during the interval. This column is non-zero value when application delay exceeds the bad threshold configured for it. The valid format is a positive integer.

Application Fair Delay (msec) The delay time (in milliseconds) in the application tier collected during the interval. This column is non-zero value when application delay exceeds the fair threshold configured for it. The valid format is a positive integer.

Application Good Delay (msec) The delay time (in milliseconds) in the application tier collected during the interval. This column is non-zero when application delay is less than fair threshold configured for it. The valid format is a positive integer.

Application Tier Delay Type This attribute defines the request type based on its delay time in the application tier. Valid values are Unknown, Good, Fair, and Bad.

Application Tier Response (msec) The actual response time in milliseconds in the application tier collected during the interval. The valid format is a positive integer.

Average Response (ms) The average time (in milliseconds) required each time this request ran during the interval. The valid format is a positive integer.

ASID The identifier (decimal) assigned to the address space running this servant region.

Backend Bad Delay (msec) The delay time (in milliseconds) in the backend tier collected during the interval. This column is non-zero value when backend delay exceeds the bad threshold configured for it. The valid format is a positive integer.

Backend Fair Delay (msec) The delay time (in milliseconds) in the backend tier collected during the interval. This column is non-zero value when backend delay exceeds the fair threshold configured for it. The valid format is a positive integer.

Backend Good Delay (msec) The delay time (in milliseconds) in the backend tier collected during the interval. This column is non-zero when backend delay is less than fair threshold configured for it. The valid format is a positive integer.

Backend Tier Delay Type This attribute defines the request type based on its delay time in the backend tier. Valid values are Unknown, Good, Fair, and Bad.

Backend Tier Response (msec) The actual response time in milliseconds in the backend tier collected during the interval. The valid format is a positive integer.

Client Bad Delay (msec) The delay time (in milliseconds) in the client tier collected during the interval. This column is non-zero value when client delay exceeds the bad threshold configured for it. The valid format is a positive integer.

Client Fair Delay (msec) The delay time (in milliseconds) in the client tier collected during the interval. This column is non-zero value when client delay exceeds the fair threshold configured for it. The valid format is a positive integer.

Client Good Delay (msec) The delay time (in milliseconds) in the client tier collected during the interval. This column is non-zero when client delay is less than fair threshold configured for it. The valid format is a positive integer.

Client Tier Delay Type This attribute defines the request type based on its delay time in the client tier. Valid values are Unknown, Good, Fair, and Bad.

Client Tier Response (msec) The actual response time in milliseconds in the client tier collected during the interval. The valid format is a positive integer.

Completion Count The number of requests that successfully completed during the interval. The valid format is a positive integer.

Custom Request Count The number of custom requests. The valid format is a positive integer.

Custom Request Time (ms) The average time (in milliseconds) the custom requests spent. The valid format is a positive integer.

Custom Request Time (%) The percentage of time the custom requests spent. The valid format is a decimal (formatted to one decimal place).

EJB Count The number of times this request invoked an Enterprise Java Bean (EJB) request. The valid format is a positive integer.

EJB Time (ms) The average time (in milliseconds) this request spent processing Enterprise Java Bean (EJB) requests. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

EJB Time (%) The percentage of time this request spent processing Enterprise Java Bean (EJB) requests. The valid format is a decimal (formatted to one decimal place).

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

JCA Count The number of times this request invoked a JEE Connector Architecture (JCA) request. The valid format is a positive integer.

JCA Time (ms) The average time (in milliseconds) this request spent processing JEE Connector Architecture (JCA) requests. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

JCA Time (%) The percentage of time this request spent processing JEE Connector Architecture (JCA) requests. The valid format is a decimal (formatted to one decimal place).

JMS Count The number of times this request invoked a Java Message Service (JMS) request. The valid format is a positive integer.

JMS Time (ms) The average time (in milliseconds) this request spent processing Java Message Service (JMS) requests. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

JMS Time (%) The percentage of time this request spent processing Java Message Service (JMS) requests. The valid format is a decimal (formatted to one decimal place).

JNDI Count The number of times this request invoked a Java Naming and Directory Interface (JNDI) request. The valid format is a positive integer.

JNDI Time (ms) The average time (in milliseconds) this request spent processing Java Naming and Directory Interface (JNDI) requests. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

JNDI Time (%) The percentage of time this request spent processing Java Naming and Directory Interface (JNDI) requests. The valid format is a decimal (formatted to one decimal place).

Level 2 Request Count The number of times this request was run with Mod Level 2 turned on. The valid format is a positive integer.

Level 2 Total Time (ms) The total time (in milliseconds) this request was run with Mod Level 2 turned on. The valid format is a positive integer.

Longest Response (ms) The maximum time (in milliseconds) it took this request to run during the interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Origin Node The name of the application server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Portal Processing Count The number of times the request invoked a WebSphere Portal page or portlet request. The valid format is a positive integer.

Portal Processing Time (ms) The average time (in milliseconds) the request spent in processing WebSphere Portal page or portlet requests. This field can have a zero value if the total time is less than the number of requests. The valid format is a positive integer.

Portal Processing Time (%) The percentage of time the request spent in processing WebSphere Portal page or portlet requests. The valid format is a decimal (formatted to one decimal place).

Process ID The process identifier of the Java virtual machine. The valid format is a positive integer.

Request Bad Response Threshold (msec) The threshold that defines the bad requests. A request that spends more time to complete than this threshold to complete is a bad request. The valid format is a positive integer.

Request Completion (%) The percentage of the requests that completed successfully during the interval. The valid format is a positive integer.

Request Completion Level The completion level of the requests during the interval. Valid values are Unknown, Good, Fair, and Bad.

Request Count The number of times this request ran during the interval. The valid format is a positive integer.

Request Detail The URI for servlet requests, or the method name for EJBs. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Fair Response Threshold (msec) The threshold that defines the fair requests. A request that spends more time than this threshold and less time than the *Request Bad Response Threshold (msec)* attribute to complete is a fair request. The valid format is a positive integer.

Request Bad Delay (msec) The delay time (in milliseconds) collected during the interval. This column is non-zero value when the whole request response time exceeds the bad threshold configured for it. The valid format is a positive integer.

Request Fair Delay (msec) The delay time (in milliseconds) collected during the interval. This column is non-zero value when the whole request response time exceeds the fair threshold configured for it. The valid format is a positive integer.

Request Good Delay (msec) The delay time (in milliseconds) collected during the interval. This column is non-zero value when the whole request response time is less than fair threshold configured for it. The valid format is a positive integer.

Request Delay Type The type of the request delay. Valid values are Unknown, Good, Fair, and Bad.

Request Label A shortened version of Request Name, used to display the request name in the chart view. The valid format is an alphanumeric string, with a maximum of 32 characters.

Request Name The URL for servlet requests, or the fully qualified class name for EJBs. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Rate (per sec) The number of requests completed per second during the interval. If the sampling rate is less than 100%, this number is extrapolated to estimate 100% of completed requests. The valid format is a decimal (formatted to three decimal places).

Request Type The type of request being run. Valid values are Servlet, EJB_Method, Custom, All_Workloads, Unknown, Portlet, SCA, web service provider, and web service client.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 45. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Sampling Rate (%) The percentage of requests being sampled. The valid format is a positive integer.

SCA Count The number of times this request invoked a Service Component Architecture (SCA) request. The valid format is a positive integer.

SCA Time (ms) The average time (in milliseconds) this request spent processing Service Component Architecture (SCA) requests. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

SCA Time (%) The percentage of time this request spent processing Service Component Architecture (SCA) requests. The valid format is a decimal (formatted to one decimal place).

Server Name The name of the WebSphere application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Servlet Count The number of times this request invoked a Servlet request. The valid format is a positive integer.

Servlet Time (ms) The average time (in milliseconds) this request spent processing Servlet requests. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

Servlet Time (%) The percentage of time this request spent processing Servlet requests. The valid format is a decimal (formatted to one decimal place).

SQL Connect Count The number of times this request connected to a JDBC database. The valid format is a positive integer.

SQL Connect Time (ms) The average time (in milliseconds) this request spent connecting to a JDBC database. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

SQL Connect Time (%) The percentage of time this request spent connecting to a JDBC database. The valid format is a decimal (formatted to one decimal place).

SQL Execute Count The number of times this request executed a JDBC database. The valid format is a positive integer.

SQL Execute Time (ms) The average time (in milliseconds) this request spent executing a JDBC database. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

SQL Execute Time (%) The percentage of time this request spent executing a JDBC database. The valid format is a decimal (formatted to one decimal place).

SQL Query Count The number of times this request queried a JDBC database. The valid format is a positive integer.

SQL Query Time (ms) The average time (in milliseconds) this request spent querying a JDBC database. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

SQL Query Time (%) The percentage of time this request spent querying a JDBC database. The valid format is a decimal (formatted to one decimal place).

SQL Update Count The number of times this request updated a JDBC database. The valid format is a positive integer.

SQL Update Time (ms) The average time (in milliseconds) this request spent updating a JDBC database. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

SQL Update Time (%) The percentage of time this request spent updating a JDBC database. The valid format is a decimal (formatted to one decimal place).

Summary Indicates that this row is a summary row of statistical totals for all rows.

Total Time (ms) The total CPU time (in milliseconds) this request consumed during the interval. The valid format is a positive integer.

Web Service Count The number of times this request invoked a Web Service request. The valid format is a positive integer.

Web Service Time (ms) The average time (in milliseconds) this request spent processing Web Service requests. This field can have a zero value if the total time is less than the number of requests. The valid format is a positive integer.

Web Service Time (%) The percentage of time this request spent processing Web Service requests. The valid format is a decimal (formatted to one decimal place).

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Requests Monitoring Configuration attributes

The **Requests Monitoring Configuration** attributes provide information for all requests monitored in application. Use these attributes to monitor application edge requests. The agent supports three types of edge requests, Servlet/JSP, EJB, and Portal.

The attributes within this group are used to build the Request Baseline workspace.

Application Name The name of the application to which the request belongs. The valid format is an alphanumeric string, with a maximum of 256 characters.

Application ID The unique identifier that is assigned automatically when the application is first configured and is preserved during the whole application life cycle. The valid format is a positive integer.

Application Tier Threshold (msec) The response time threshold in the application tier in milliseconds. The valid format is a positive integer.

Auto Threshold Bad Projection (%) The bad response time projection used for auto threshold. The valid format is a positive integer.

Auto Threshold Fair Ratio The percentage to derive the fair response time threshold from the baseline selection. The valid format is a positive integer.

Auto Threshold Fair Projection (%) The fair response time projection used for auto threshold. The valid format is a positive integer.

Auto Threshold Mode The request auto threshold mode. Valid values are Default, Custom, and Disabled.

Auto Threshold Deviation (%) The maximum allowed deviation of requests baseline data used for auto threshold. The valid format is a positive integer.

Auto Threshold Percent (%) The minimum percent of requests baseline data used for auto threshold. The valid format is a positive integer.

Backend Tier Threshold (msec) The response time threshold in the backend tier in milliseconds. The valid format is a positive integer.

Bad Response Threshold (msec) The time (in milliseconds) that defines the bad requests. A request that spends more time than this threshold to complete is a bad request. Use this attribute with `Fair Response Threshold (msec)` attribute and `Fair Response Zone (msec)` attribute. The valid format is a positive integer.

Bad Errors Rate Threshold The value of bad error rate percentage. The valid format is a positive integer.

Baselined Request Count The total number of requests accumulated in the baseline. This counter shows the data since the baseline starts. The valid format is a positive integer.

Client Tier Threshold (msec) The response time threshold in the client tier in milliseconds. The valid format is a positive integer.

Fair Response Threshold (msec) The time (in milliseconds) that defines the fair requests. A request that spends less time than this threshold to complete is a good request. Use this attribute with `Fair Response Zone (msec)` attribute and `Bad Response Threshold (msec)` attribute. The valid format is a positive integer.

Fair Response Zone (msec) The time span (in milliseconds) that defines the fair requests. This time span is between the fair response time threshold and the bad response time threshold. If the response time of a request falls into this time span, the request is a fair request. Use this attribute with `Fair Response Threshold (msec)` attribute and `Bad Response Threshold (msec)` attribute. The valid format is a positive integer.

Fair Errors Rate Threshold The value of fair error rate percentage. The valid format is a positive integer.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Detail The request detail name. The valid format is an alphanumeric string, with a maximum of 256 characters.

Request ID The unique identifier of the request that belongs to the application. The valid format is a positive integer.

Request Label A shortened version of Request Name, used to display the request name in the chart view. The valid format is an alphanumeric string, with a maximum of 24 characters.

Request Name The URL for servlet requests, or the fully qualified class name for EJBs. The valid format is an alphanumeric string, with a maximum of 256 characters.

Request Type The type of request being run. Valid values are All, Servlet/JSP, EJB, Portal, SCA Target, Web Service Provider, and Web Service Client.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 46. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Request Times and Rates attributes

The **Request Times and Rates** attribute group provides information about historical request throughput and average response time for a particular application server.

The attributes within this group are used to build the WebSphere App Server workspace.

Application Name The name of the application to which the request belongs. The valid formats are as follows:

- An alphanumeric string, with a maximum of 256 characters.
- An empty string means that this sample is aggregated data for all applications

ASID The identifier (decimal) assigned to the address space running this servant region.

Average Load The average number of concurrent requests during the interval. The valid format is a decimal (formatted to three decimal places).

Average Request Completion Rate The average request completion rate (that is, the request throughput). If the sampling rate is less than 100%, this number is extrapolated to estimate 100% of completed requests. The valid format is a positive integer.

Average Request Response Time The average request response time, in milliseconds. The valid format is a positive integer.

Error Rate (%) The error rate of the request during the interval. The valid format is a decimal (formatted to three decimal places).

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID Indicates the process ID of the JVM.

Request Count The number of requests processed during the current interval. The valid format is a positive integer.

Request Data Monitoring Level Indicates request data monitoring level for application.

Request Type The type of request being run. Valid values are Servlet, EJB_Method, Custom, All_Workloads, Unknown, Portlet, SCA Target, Web Service Provider, and Web Service Client.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 47. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Sampling Rate (%) The percentage of edge requests-such as servlets and JSPs-that were sampled during the interval. The valid format is a positive integer.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Indicates that this row is a summary row of statistical totals for all rows.

Total (ms) The total time used (in milliseconds) during the interval. The valid format is a decimal (formatted to three decimal places).

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Request attributes

The **Selected Request** attribute group provides detailed information about requests for database (that is, JDBC), messaging (that is, JMS), or EIS (that is, J2C) services by transactions.

The attributes within this group are used to build these workspaces:

- Selected Request - Datasources
- Selected Request - JMS Queues
- Selected Request - Resource Adapters
- Selected Request - Portal Processing
- "Selected Request - Service Components workspace" on page 117

Important: The attributes within this attribute group contain meaningful values only if your site has set the request data monitoring level to Level2 to collect data on nested requests.

Activity Category The type of request. Valid values are n/a (not applicable), JDBC, JMS, JCA, and Unknown.

Activity Detail Detailed information about the activity performed by the selected request, for example, the SQL statement being processed. The valid format is an alphanumeric string, with a maximum of 128 characters.

Activity Label An abbreviated version of Activity Name, used to display the activity name in the chart view. The valid format is an alphanumeric string, with a maximum of 32 characters.

Activity Name The resource that the request is accessing, for example, the data source name. The valid format is an alphanumeric string, with a maximum of 128 characters.

Activity Type The type of the resource being requested. Valid values are:

Table 48. Activity types

Type	Definition
n/a	not applicable
Servlet	A call to a doGet or doPost methods of a servlet
EJB_Method_Call	A call to a business method for an EJB class
Obtain_SQL_Connection_from_Datasource	A call to obtain a connection from a JDBC data source
SQL_Query	A Query request to a JDBC data source
SQL_Update	An Update request to a JDBC data source
SQL_Other	Any other request to a JDBC data source
JMS_Message_Browse	A call to browse a message from a JMS queue
JMS_Message_Get	A call to receive a message from a JMS queue (that is, a destructive get)
JMS_Message_Put	A call to put a message from a JMS queue
JMS_Publish_Message	A call to publish a publication to a JMS queue
JCA_CCI_Execute_interaction	A request by a JEE application to execute a JCA interaction (a JDBC, JMS, or other JCA-supported operation) against a backend system
JNDI_Lookup	A call to JNDI to build an InitialContext or to perform a lookup
Unknown	The activity type cannot be determined
Portlet_Processing	A call for portlet processing request
Portlet_Authorization	A call for portlet authorization request
Portal_Authentication	A call for portal authentication request
Portal_Model_Building	A call for portal page model building request
Portal_Page_Loading	A call for portal page loading request
Portal_Page_Rendering	A call for portal page rendering request
Portal_Legacy_Action	A call for portal legacy action request
Portal_Standard_Action	A call for portal standard action (JSR-88) request
SCA	A call for Service Component Architecture (SCA) request
Web Service Provider	A call to a web service provide
Web Service Client	A call to a web service client

ASID The identifier (decimal) assigned to the address space running this servant region.

Average Response (ms) The average time (in milliseconds) executing this request, per occurrence. The valid format is a decimal (formatted to one decimal place).

Delay Percent The percentage of execution time this activity consumed on average when processing this request. The valid format is a decimal (formatted to one decimal place).

Delay Percent Count The count of individual delays used for Delay Percent. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Longest Response (ms) The worst-case response time (in milliseconds) experienced by this request. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Occurrences The number of times this request was executing during the interval. The valid format is a positive integer.

Origin Node The name of the application server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The unique identifier of the JVM process (the class ID of the JVM). The valid format is a positive integer.

Request Detail The URI for servlet requests, or the method name for EJBs. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Name The URL for servlet requests, or the fully qualified class name for EJBs. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Type The type of transaction being run. Valid values are Servlet, EJB_Method, Custom, All_Workloads, Unknown, and Portlet.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 49. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute

Table 49. Format of the 12-character timestamp (continued)

Character String	Meaning
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Sampling Rate (%) The percentage of edge requests-such as servlets and JSPs-that were sampled for nested requests during the interval. The valid format is a positive integer.

Server Name The name of the WebSphere application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Indicates that this row is a summary row of statistical totals for all rows.

Total Time (ms) The total CPU time (in milliseconds) consumed by this request. The valid format is a positive integer.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Servlet Sessions attributes

The **Servlet Sessions** attribute group provides information about servlet sessions.

A session is a series of requests to a servlet, originating from the same user at the same browser. Applications running in a Web container use Sessions to monitor the actions of individual users. The attributes within this group are used to build the Sessions workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Average Concurrently Active Sessions The average number of concurrently active sessions during the sampling interval. A session is active if WebSphere application server is currently processing a request that uses the session. The valid format is a

decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Average Concurrently Live Sessions The average number of sessions cached in memory during the sampling interval. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Average Serializable Session Object Size (bytes) The average size (in bytes) of the serializable attributes of in-memory sessions. This number is at a session level only and includes only session objects that contain at least one serializable attribute object (a session can contain some attributes that are serializable and some that are not). This value is a measurement of the data at the end of the PMI sampling interval, not of the data in the entire sampling interval. The valid format is a positive integer.

Average Session Lifetime (ms) The average session lifetime (in milliseconds), calculated by subtracting the time the session was created from the time it was invalidated. The valid format is a decimal (formatted to three decimal places).

Session Lifetime Count The count of times that were averaged for Average Session Lifetime . The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Broken Session Affinities The number of HTTP session affinities that broke, not counting WebSphere application server intentional breaks of session affinity. This is the number of requests received for sessions that were last accessed from another web application and can indicate failover processing or a corrupted plug-in configuration. The valid format is a positive integer.

Broken Session Affinity Rate (per sec) The rate (per second) of the number of HTTP session affinities that break, not counting the WebSphere application server intentional breaks of session affinity, during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Cache Discard Rate (per sec) The rate (per second) at which session objects have been forced out of the cache during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Cache Discards The number of session objects that have been forced out of the cache. An LRU algorithm removes old entries to make room for new sessions and cache misses (this applies only to persistent sessions). The valid format is a positive integer.

Enterprise Application Name The name of the Enterprise application running the servlet. The valid format is an alphanumeric string, with a maximum of 256 characters.

External Read Size (bytes) The size (in bytes) of the session data read from the persistent store (applicable only to serialized, persistent sessions). The valid format is a decimal (formatted to three decimal places).

External Read Time (ms) The time (in milliseconds) taken to read the session data from the persistent store (applicable only to persistent sessions). For multirow sessions, the metrics are for the attributes; for single-row sessions, the metrics are for the whole session. When using a JMS persistent store, the user has the choice of whether to serialize the data being replicated; if the data are not serialized, this counter is not available. The valid format is a decimal (formatted to three decimal places).

External Write Size (bytes) The size (in bytes) of session data written to the persistent store (applicable only to serialized, persistent sessions). The valid format is a decimal (formatted to three decimal places).

External Write Time (ms) The time (in milliseconds) taken to write the session data from the persistent store (applicable only to serialized, persistent sessions). The valid format is a decimal (formatted to three decimal places).

Failed Session Request Rate (per sec) The rate (per second) that a request for a new session could not be handled because it would exceed the maximum session count for the sampling interval. The valid format is a decimal (formatted to three decimal places).

Failed Session Requests This attribute collects data from the NoRoomForNewSessionCount metric in the Servlet Sessions Counters PMI module. The number of times a request for a new session could not be handled because it would exceed the maximum session count; this applies only to a session in memory with AllowOverflow=false. The valid format is a positive integer.

Instrumentation Level The web instrumentation level for this web application. For WebSphere 5, the valid values are None, Low, Medium, High, and Maximum; for WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Max Serializable Session Object Size (bytes) The maximum size (in bytes) of the serializable attributes of in-memory sessions. This number is at a session level only and includes only session objects that contain at least one serializable attribute object (a session can contain some attributes that are serializable and some that are not). This value is a measurement of the data at the end of the PMI sampling interval, not of the data in the entire sampling interval. The valid format is a positive integer.

Min Serializable Session Object Size (bytes) The minimum size (in bytes) of the serializable attributes of in-memory sessions. This number is at a session level and includes only session objects that contain at least one serializable attribute object (a session can contain some attributes that are serializable and some that are not). This value is a measurement of the data at the end of the PMI sampling interval, not of the data in the entire sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Nonexistent Session Request Rate (per sec) The rate (per second) of requests for a session that no longer exists (presumably because the session timed out) during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Nonexistent Session Requests The number of requests for a session that no longer exists (presumably because the session timed out). Use this counter to determine if the timeout is too short. The valid format is a positive integer.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 50. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the WebSphere application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Session Creation Rate (per sec) The rate (per second) of sessions created during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Session Invalidation Rate (per sec) The rate (per second) at which sessions were invalidated during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Sessions Created The number of sessions created during the sampling interval. The valid format is a positive integer.

Sessions Invalidated The number of sessions invalidated during the sampling interval. The valid format is a positive integer.

Set Instrumentation Level Type Indicates the WebSphere resource category, which is used by the agent to modify the Instrumentation Level for transaction data collection.

Summary of Servlet Sessions Whether this row is a summary row of statistical totals collected for the servlet sessions. The valid values are No and Yes.

Time since Last Activated The time difference (in the locale-specific format, for example hh:mm:ss.msecs) between the previous and current access timestamps. Does not include session timeouts. The valid format is a timestamp.

Total Serializable Session Object Size (bytes) The total size (in bytes) of all the in-memory session objects. This includes only the serializable attributes in the session object; at least one such attribute must be present to be included in this total. This value is a measurement of the data at the end of the PMI sampling interval, not of the data in the entire sampling interval. The valid format is a positive integer.

Serializable Session Object Size Count The count of object sizes that were used for Total Serializable Session Object Size. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Web Application Archive The name of the web application WAR file. The valid format is an alphanumeric string, with a maximum of 128 characters.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Servlets JSPs attributes

The **Servlets JSPs** attributes provide performance information for servlets and Java server pages (JSPs).

Examples of Servlets JSPs attributes include the average number of concurrent requests for a servlet and the amount of time it takes for a servlet to complete a request. Use the Servlets JSPs attributes in situations to monitor performance and the usage of servlets and JSPs.

The attributes within this group are used to build the Servlets/JSPs - Selected Web Application workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and then select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Average Concurrent Requests The average number of concurrent requests for the servlet or JSP during the interval. The valid format is a decimal (formatted to three

decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Average Response Time (ms) The time (in milliseconds) it took the servlet to perform a task during the interval. The valid format is a decimal (formatted to three decimal places).

Response Time Count The count of times that were averaged for Average Response Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Enterprise Application Name The name of the Enterprise application. The valid format is an alphanumeric string, with a maximum of 128 characters.

Error Count The number of errors or exceptions that have occurred in the servlet during the interval. The valid format is a positive integer.

Error Rate (per sec) The servlet exceptions or errors (per second) since the previous sample. The valid format is a decimal (formatted to three decimal places).

Instrumentation Level The instrumentation level for this servlet. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Count The number of total requests for the servlet during the interval. The valid format is a positive integer.

Request Rate (per sec) The servlet requests (per second) since the previous sample. The valid format is a decimal (formatted to three decimal places).

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 51. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Virtual Host Name The name of the virtual host. The valid format is an alphanumeric string, with a maximum of 64 characters.

Servlet/JSP Name The name of the current servlet or JSP. The valid format is an alphanumeric string, with a maximum of 128 characters.

Date and Time the Servlet Was Loaded The date and time when the servlet was loaded.

JSP Path Name The name of the JSP path. The valid format is an alphanumeric string, with a maximum of 128 characters.

Total (ms) The total time (in milliseconds) used during the interval. The valid format is a decimal (formatted to three decimal places).

Type Whether this entry represents a servlet or Java server page (JSP). The valid values are Servlet and JSP.

Web Application Archive The name of the web application WAR file. The valid format is an alphanumeric string, with a maximum of 128 characters.

Set Instrumentation Level Type The WebSphere resource category, which is used by the agent to modify the Instrumentation Level for transaction data collection. Valid values are: ORBThreadPool, HTTPSession, DBPool, Servlet, Transaction, ObjectPool, EJB, EJBMethod, AllResources, JVMMemory, ThreadPool, WCThreadPool, WebApplicationSubModule, DynamicCache, J2CPool, ORB, WLM, ServletSessions.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Scheduler attributes

The **Scheduler** attributes display data for the Scheduler service.

The attributes within this group are used to build the Scheduler workspace.

Instrumentation Level The instrumentation level for the Scheduler. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Poll Count The number of polls which are collected on the intervals. The valid format is a positive integer.

Poll Duration The average alarms during the latency. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Poll Query Duration The duration of poll query. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Row Number The row number. The valid format is a positive integer.

Run Duration The run duration. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 52. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Scheduler Name The name of the scheduler. The valid format is an alphanumeric string, with a maximum of 256 characters.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Whether this row is a summary row of statistical totals for all rows. Valid values are No and Yes.

Task Collision Rate The rate of the task collision. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Task Delay Duration The duration of the task delay. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Task Expiration Rate The rate of the task expiration. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Task Failure Count The number of the failed tasks. The valid format is a positive integer.

Task Finish Count The number of the finished tasks which are collected on the intervals. The valid format is a positive integer.

Task Finish Rate The rate of the finished tasks. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Task Run Rate The rate of the run tasks. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Service Component Elements attributes

The **Service Component Elements** attributes provide aggregated information about the performance data for all the service components and their elements.

The attributes within this group are used to build the Service Component Elements workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and then select it again later. Each time you select the workspace, these attributes are updated with the latest data.
- Attributes in this group are only provided for IBM WebSphere application server version 6.0 or later.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Average Response Time (ms) The average response time (in milliseconds) in the current interval. The valid format is a decimal (formatted to three decimal places).

Component The type of the component. The value format is an alphanumeric string, with a maximum of 256 characters.

Component Name The component name of the service. The value format is an alphanumeric string, with a maximum of 256 characters.

Element The type of the element. The valid format is a positive integer.

Element Name The name of the element. The value format is an alphanumeric string, with a maximum of 256 characters.

Error Rate (per sec) The computed error rate. The valid format is a decimal (formatted to three decimal places).

Failed Count The failed invocations. The valid format is a positive integer.

Instrumentation Level The instrumentation level for the service component elements. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Count The number of requests during the interval. The valid format is a positive integer.

Request Rate (per sec) The rate of requests during the interval per second. The valid format is a decimal (formatted to three decimal places).

Row Number The row number. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 53. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Success Count The successful invocations. The valid format is a positive integer.

Summary Whether this row is a summary row of statistical totals for all rows. Valid values are No and Yes.

Total (ms) The total time used (in milliseconds) during the interval. The valid format is a decimal (formatted to three decimal places).

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Service Components attributes

The **Service Components** attributes provide aggregated information about the overview performance of the key service components.

The attributes within this group are used to build the Service Components workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling. Thus the attributes within this attribute group initially contain zeros

until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.

- Attributes in this group are only provided for IBM WebSphere application server version 6.0 or later.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Count The bad request count. The valid format is a positive integer.

Instrumentation Level The instrumentation level for the service components. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Name The type of the component. Valid values are Service_Component_Architecture, Business Rules, Map, Mediation, Business State Machine, and Selector.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 54. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Whether this row is a summary row of statistical totals for all rows. Valid values are No and Yes.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Thread Pools attributes

The **Thread Pools** attribute group provides information about the data source, as well as connection statistics, for database connection pools in a WebSphere application server. Use it to monitor pools activity and to spot potential throttling.

The attributes within this group are used to build the Pool Analysis and Thread Pools workspaces.

Important:

- The attributes within this attribute group contain zeros for performance data if your site set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and then select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Application ID Indicates JEE application ID.

Average Active Threads The average number of concurrently active threads during the sampling interval. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Average Free Threads The average number of free threads in the pool. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Average Pool Size The average number of threads in the pool. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Important: This value might exceed Maximum Pool Size in certain configurations where the pool is enabled to grow beyond the specified maximum size.

Instrumentation Level The instrumentation level for the thread pools. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Maximum Pool Size The configured maximum number of threads allowed in the pool. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Percent of Time Pool at Max The average percentage of time that all threads were in use during the sampling interval. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Percent Used Bad The bad percent of pool usage by application. The valid format is a positive integer.

Percent Used Fair The fair percent of pool usage by application. The valid format is a positive integer.

Percent Used Good The good percent of pool usage by application. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 55. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the WebSphere application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Set Instrumentation Level Type Indicates the WebSphere resource category, which is used by the agent to modify the Instrumentation Level for transaction data collection.

Summary of Thread Pools Whether this row is a summary row of statistical totals collected for all thread pools. The valid values are No and Yes.

Thread Creation Rate (per sec) The rate (per second) at which threads were created during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Thread Destruction Rate (per sec) The rate (per second) at which threads were destroyed during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Thread Pool Name The name of the thread pool. The valid format is an alphanumeric string, with a maximum of 256 characters.

Threads Created The number of threads created during the sampling interval. The valid format is a positive integer.

Threads Destroyed The number of threads destroyed during the sampling interval. The valid format is a positive integer.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Topic Spaces attributes

The **Topic Spaces** attributes provide aggregated information about publish/subscribe messaging.

The attributes within this group are used to build the Destinations workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.
- Attributes in this group are only provided for IBM WebSphere application server version 6.0 or later.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Assured Persistent Local Subscription Hits The cumulative total of subscriptions which have matched assured persistent publications. The valid format is a positive integer.

Assured Persistent Messages Published The number of Assured Persistent messages published. The valid format is a positive integer.

Best Effort Non-persistent Local Subscription Hits The cumulative total of subscriptions which have matched best effort non-persistent publications. The valid format is a positive integer.

Best Effort Non-persistent Messages Published The number of best effort non-persistent messages published. The valid format is a positive integer.

Durable Local Subscription The number of durable subscriptions. The valid format is a positive integer.

Express Non-persistent Local Subscription Hits The cumulative total of subscriptions which have matched express non-persistent publications. The valid format is a positive integer.

Express Non-persistent Messages Published The number of express non-persistent messages published. The valid format is a positive integer.

Incomplete Publication The number of publications not yet received by all current subscribers. If this number is unexpected, view the publication using the admin console to take actions. The valid format is a positive integer.

Instrumentation Level The instrumentation level for the topic spaces. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Local Oldest Publication The longest time any publication has spent on this topic space. If this time is not what was expected, view the message using the admin console to decide what action needs to be taken. The valid format is a positive integer.

Local Publisher The number of local publishers to topics in this topic space. The valid format is a positive integer.

Local Publisher Attaches The number of times an attachment has been made to this topic space by local producers. The lifetime of this value is the lifetime of the messaging engine. The valid format is a positive integer.

Messaging Engine Name The name of the message engine. The value format is an alphanumeric string, with a maximum of 256 characters.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Non-Durable Local Subscription The number of non-durable subscriptions. The valid format is a positive integer.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Reliable Non-persistent Local Subscription Hits The cumulative total of subscriptions which have matched reliable non-persistent publications. The valid format is a positive integer.

Reliable Non-persistent Messages Published The number of reliable non-persistent messages published. The valid format is a positive integer.

Reliable Persistent Local Subscription Hits The cumulative total of subscriptions which have matched reliable persistent publications. The valid format is a positive integer.

Reliable Persistent Messages Published The number of reliable persistent messages published. The valid format is a positive integer.

Report Enabled Publication Expired The number of report-enabled incomplete publications that expired while on this topic space. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 56. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Whether this row is a summary row of statistical totals for all rows. Valid values are No and Yes.

Topic Space Name The name of the topic space. The valid format is an alphanumeric string, with a maximum of 256 characters.

Total Local Subscription The number of local subscriptions to topics in this topic space. The valid format is a positive integer.

Total Local Subscription Hits The cumulative total of subscriptions which have matched topic space publications. The valid format is a positive integer.

Total Messages Published The total number of publications to this topic space. The valid format is a positive integer.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Web Applications attributes

Use the **Web Applications** attributes to create situations that monitor web application performance and application server loads.

The Web Applications attributes provide aggregated information for each web application and for the application server running that application. These performance data describe all servlets and JSPs deployed to that web application as well as performance data for all servlets and JSPs running in the application server. Examples include the number of loaded servlets and JSPs and total requests. The attributes within this group are used to build the Web Applications workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Average Concurrent Requests The average number of concurrent requests for servlets and JSPs during the interval. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Average Response Time (ms) The average time (in milliseconds) required for a servlet to perform a task during the interval. Calculated by dividing the total responses by Request Count; if Request Count is zero, this value is set to blank. The valid format is a decimal (formatted to three decimal places).

Virtual Host Name The name of the virtual host. The valid format is an alphanumeric string, with a maximum of 64 characters.

Enterprise Application Name The name of the Enterprise application. The valid format is an alphanumeric string, with a maximum of 128 characters.

Error Count The number of errors or exceptions that have occurred in the servlet. The valid format is a positive integer.

Error Rate (per sec) The servlet exceptions or errors (per second) for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Instrumentation Level The web instrumentation level for this web application. For WebSphere 5, the valid values are None, Low, Medium, High, and Maximum. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Count The number of total requests for the servlet during the interval. The valid format is a positive integer.

Request Rate (per sec) The servlet requests (per second) for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 57. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Servlets Loaded The number of servlets loaded during the interval. The valid format is a positive integer.

Servlets Reloaded The number of servlets reloaded during the interval. The valid format a positive integer.

Set Instrumentation Level Type Indicates the WebSphere resource category, which is used by the agent to modify the Instrumentation Level for transaction data collection.

Subinstrumentation Level The subinstrumentation level for the web application servlet submodule. For WebSphere application server 5 the valid values are None, Low, Medium, High, and Maximum.

Note: Subinstrumentation Level is not supported in WebSphere application server 6.0 or higher. The Tivoli Enterprise Monitoring agent uses the Instrumentation Level instead.

Summary of All Applications Whether this row is a summary row of statistical totals for all web applications executed during the interval. The valid values are Yes and No.

Total (ms) The total time used during the interval. The valid format is a decimal (formatted to three decimal places).

Response Time Count The number of calls for which the response times are averaged in the Average Response Time field. The valid format is a 4-byte integer. The value -2 is used if the number is very large and can not be provided.

Web Application Archive The name of the web application WAR file. The valid format is an alphanumeric string, with a maximum of 128 characters.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Web Services attributes

The **Web Services** attributes display aggregated information about the web services, including the number of loaded web services, the number of requests delivered and processed, the request response time, and the average size of requests.

The attributes within this group are used to build the Web Services workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling. Thus the attributes within this attribute group initially contain zeros until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see “WebSphere PMI Attribute Mapping” on page 373.

Dispatched Requests The number of requests the service dispatched or delivered. The valid format is a positive integer.

Dispatch Response Time The average response time, in milliseconds, to dispatch a request. The valid format is a decimal (formatted to three decimal places).

Dispatch Response Time Count The count of times that were averaged for Dispatch Response Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Instrumentation Level The instrumentation level for the web services counters. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Payload Size The average payload size in bytes of a received request or reply. The valid format is a positive integer.

Payload Size Count The count of sizes that were averaged for Payload Size. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Processed Requests The number of requests the service successfully processed. Valid format is a positive integer.

Received Requests The number of requests the service received. The valid format is a positive integer.

Reply Payload Size The average payload size (in bytes) of a reply. The valid format is a positive integer.

Reply Payload Size Count The count of sizes that were averaged for Reply Payload Size. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Reply Response Time The average response time, in milliseconds, to prepare a reply after dispatch. The valid format is a decimal (formatted to three decimal places).

Reply Response Time Count The count of times that were averaged for Reply Response Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Request Payload Size The average payload size, in bytes, of a request. The valid format is a positive integer.

Request Payload Size Count The count of sizes that were averaged for Request Payload Size. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Request Response Time The average response time, in milliseconds, to prepare a request for dispatch. The valid format is a decimal (formatted to three decimal places).

Request Response Time Count The count of times that were averaged for Request Response Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Response Time The average response time (in milliseconds) for a successful request. The valid format is a decimal (formatted to three decimal places).

Response Time Count The count of times that were averaged for Response Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 58. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Whether this row is a summary row of statistical totals for all rows. Valid values are No and Yes.

Total Dispatch (ms) The total time (in milliseconds) the service dispatches requests. The valid format is a decimal (formatted to three decimal places).

Total Prepare (ms) The total time (in milliseconds) the service prepares requests. The valid format is a decimal (formatted to three decimal places).

Total Processing (ms) The total time (in milliseconds) the service processes requests. The valid format is a decimal (formatted to three decimal places).

Web Service The name of the web service. The valid format is an alphanumeric string, with a maximum of 256 characters.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Web Services Gate Way attributes

The **Web Services Gate Way** attributes display aggregated information about the Web Services Gateway, including synchronous requests, asynchronous requests, synchronous responses, and asynchronous responses.

The attributes within this group are used to build the Web Services workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling; thus the attributes within this attribute group initially contain zeros until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Asynchronous Requests The number of asynchronous requests made. The valid format is a positive integer.

Asynchronous Responses The number of asynchronous responses made. The valid format is a positive integer.

Instrumentation Level The instrumentation level for the Web Services Gateway counters. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and

SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 59. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary Whether this row is a summary row of statistical totals for all rows. Valid values are No and Yes.

Synchronous Requests The number of synchronous requests made. The valid format is a positive integer.

Synchronous Responses The number of synchronous responses made. The valid format is a positive integer.

Web Service The name of the web service. The valid format is an alphanumeric string, with a maximum of 256 characters.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

WebSphere Agent Events attributes

The **WebSphere Agent Events** attributes provide information about agent-level events that affect the ability of the Tivoli Enterprise Monitoring Agent to collect data about WebSphere application server. These attributes provide exception and error messages, their IDs, and their severities.

The attributes within this group are used to build the WebSphere Agent workspace.

Event Date and Time The date and time the event occurred. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 60. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Message Description The message description. The valid format is an alphanumeric string, with a maximum of 256 characters.

Message ID The message ID. The valid format is an alphanumeric string, with a maximum of eight characters.

Node Name The system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Sequence Number The sequence number of the message. The valid format is a positive integer.

Severity The severity of the event. Valid values are Info, Warning, Error, and Severe.

Function The valid format is an alphanumeric string, with a maximum of 32 characters.

File Name The name of the file. The valid format is an alphanumeric string, with a maximum of 8 characters.

Line Number The number of the line. The valid format is a 4-byte integer.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

WMQ Client Link Communications attributes

The **WMQ Client Link Communications** attributes display aggregated information for all the clients of WMQ Queue Managers that are or have been connected to this application server.

The attributes within this group are used to build the WMQ Client Link Communications workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling. Thus the attributes within this attribute group initially contain zeros until you select the workspace and reselect it later. Each time you reselect the workspace, these attributes are updated with the latest data.
- Attributes in this group are only provided for IBM WebSphere application server version 6.0 or later.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

API Calls Serviced The number of MQ API call requests serviced on behalf of WMQ JMS clients. The valid format is a positive integer.

Batches Sent The number of batches of messages sent to network attached WMQ JMS clients. The valid format is a positive integer.

Clients Attached The current number of WMQ JMS clients attached to this application server. The valid format is a positive integer.

Comms Errors The number of errors that have caused connections to WMQ JMS clients to be dropped. The valid format is a positive integer.

Instrumentation Level The instrumentation level for the WMQ client link communications. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Messages Received The number of messages received from network attached WMQ JMS clients. The valid format is a positive integer.

Messages Sent The number of messages sent to network attached WMQ JMS clients. The valid format is a positive integer.

Messaging Engine Name The name of the message engine. The value format is an alphanumeric string, with a maximum of 256 characters.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Reads Blocked The number of read operations that could not be completed immediately. This number can be used as an indicator of network congestion when communicating with WMQ JMS clients. The valid format is a positive integer.

Received (bytes) The number of bytes of data received from network attached WMQ JMS clients. This includes bytes of message data as well as bytes of data used to control the flow of messages. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 61. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Sent (bytes) The number of bytes of data sent to network attached WMQ JMS clients. This includes bytes of message data as well as bytes of data used to control the flow of messages. The valid format is a positive integer.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Writes Blocked The number of write operations that could not be completed immediately. This number can be used as an indicator of network congestion when communicating with WMQ JMS clients. The valid format is a positive integer.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

WMQ Link Communications attributes

The **WMQ Link Communications** attributes display aggregated information for all the WMQ Queue Managers that are or have been connected to this application server.

The attributes within this group are used to build the WMQ Link Communications workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling. Thus the attributes within this attribute group initially contain zeros until you select the workspace and then select it again later. Each time you select the workspace, these attributes are updated with the latest data.
- Attributes in this group are only provided for IBM WebSphere application server version 6.0 or later.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Batches Received The number of batches of messages received from network attached WMQ Queue Managers. The valid format is a positive integer.

Batches Sent The number of batches of messages sent to network attached WMQ Queue Managers. The valid format is a positive integer.

Comms Errors The number of communication errors that resulted in a network connection to a WMQ Queue Manager being disconnected. The valid format is a positive integer.

Instrumentation Level The instrumentation level for the WMQ link communications. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Long Retries The number of long retries. This indicates the number of times channels were disconnected and could not be re-established for longer periods of time. The valid format is a positive integer.

Messages Received The number of messages received from network attached WMQ Queue Managers. The valid format is a positive integer.

Messages Sent The number of messages sent to network attached WMQ Queue Managers. The valid format is a positive integer.

Messaging Engine Name The name of the message engine. The value format is an alphanumeric string, with a maximum of 256 characters.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

QM Attached The total number of WMQ Queue Managers currently network attached to this application server. The valid format is a positive integer.

Reads Blocked The number of read operations that could not be completed immediately. This number can be used as an indicator of network congestion when communicating with WMQ Queue Managers. The valid format is a positive integer.

Receiver Received (bytes) The number of bytes of data received by receiver channels from network attached WMQ Queue Managers. The valid format is a positive integer.

Receiver Sent (bytes) The number of bytes data sent by receiver channels to network attached WMQ Queue Managers. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 62. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Sender Received (bytes) The number of bytes of data received by sender channels from network attached WMQ Queue Managers. The valid format is a positive integer.

Sender Sent (bytes) The number of bytes of data sent by sender channels to network attached WMQ Queue Managers. The valid format is a positive integer.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Short Retries The number of short retries. This indicates the number of times channels were disconnected and could not be re-established for short periods of time. The valid format is a positive integer.

Writes Blocked The number of write operations that could not be completed immediately. This number can be used as an indicator of network congestion when communicating with WMQ Queue Managers. The valid format is a positive integer.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Workload Management Client attributes

The **Workload Management Client** attribute group provides information about the client that initiates workload requests.

Workload management (WLM) optimizes the distribution of client processing tasks. Incoming work requests are distributed to the application servers, enterprise beans, servlets, and other objects that can most effectively process their requests. Workload management also provides failover when servers are not available, improving application availability. In a WebSphere application server environment, you implement workload management by using clusters, transports, and replication domains.

The attributes within this group are used to build the Workload Management workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling. Thus the attributes within this attribute group initially contain zeros until you select the workspace and then select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Client Cluster Update Rate (per sec) The rate (per second) at which times this client has received new server cluster information during the sampling interval. Use this metric to determine how often cluster information is being propagated. The valid format is a decimal (formatted to three decimal places).

Client Cluster Updates The number of times initial or updated server cluster data is sent to a WLM-enabled client from a server cluster member. Use this metric to determine how often cluster information is being propagated. The valid format is a positive integer.

Client Response Time (ms) The response time (in milliseconds) for IIOP requests sent by a client. This response time is calculated based on the time the client sends the request to the time the server sends the reply. The valid format is a decimal (formatted to three decimal places).

Client Response Time Count The count of times that were used for Client Response Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Instrumentation Level The instrumentation level for the WLM client. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Outgoing Request Rate (per sec) The rate (per second) at which outgoing IIOP requests were being sent from this client to an application server during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Outgoing Requests The number of outgoing IIOP requests being sent from this client to an application server. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 63. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the WebSphere application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Set Instrumentation Level Type Indicates the WebSphere resource category, which is used by the agent to modify the Instrumentation Level for transaction data collection.

Total Client Response (ms) The total response time (in milliseconds) for IIOP requests sent by a client. The valid format is a decimal (formatted to three decimal places).

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Workload Management Server attributes

The **Workload Management Server** attribute group provides information about the workload management server.

Workload management (WLM) optimizes the distribution of client processing tasks. Incoming work requests are distributed to the application servers, enterprise beans, servlets, and other objects that can most effectively process those requests. Workload management also provides failover when servers are not available, improving application availability. In a WebSphere application server environment, you implement workload management by using clusters, transports, and replication domains.

The attributes within this group are used to build the Workload Management workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling. Thus the attributes within this attribute group initially contain zeros until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Concurrent Requests The number of remote IIOP requests being processed by this server. The valid format is a decimal (formatted to three decimal places). This value is an average of several values collected over an interval. The interval can be either between this time and the previous time you activated this workspace, or fixed (normally 60 seconds), depending on the configuration of the Monitoring Agent.

Incoming Non-WLM Object Request Rate (per sec) The rate (per second) of incoming IIOP requests from an application running on a non-WLM client during the sampling interval. This type of client either does not have the WLM runtime present, or the client object reference was flagged not to participate in workload management. The valid format is a decimal (formatted to three decimal places).

Incoming Non-WLM Object Requests The number of incoming IIOP requests to an application from a client that does not have the WLM runtime present or whose object reference was flagged not to participate in workload management. The valid format is a positive integer.

Incoming Nonaffinity Request Rate (per sec) The rate (per second) of incoming IIOP requests to an application server based on no affinity during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Incoming Nonaffinity Requests The number of incoming IIOP requests to an application server based on no affinity. This request was sent to this server based

on workload management selection policies that were decided in the client WLM run time. The valid format is a positive integer.

Incoming Request Rate (per sec) The rate (per second) of incoming IIOP requests to an application server during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Incoming Requests The number of incoming IIOP requests to an application server during the sampling interval. The valid format is a positive integer.

Incoming Strong Affinity Request Rate (per sec) The rate (per second) of incoming IIOP requests to an application server that are based on a strong affinity during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Incoming Strong Affinity Requests The number of incoming IIOP requests to an application server that are based on a strong affinity. A strong affinity request is one that must be serviced by this application server because of a dependency that resides on the server. This request could not successfully be serviced by another member of the server cluster. The valid format is a positive integer.

Instrumentation Level The instrumentation level for the WLM server. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 64. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Cluster Update Rate (per sec) The rate (per second) at which this server received new server cluster information during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Server Cluster Updates The number of times initial or updated server cluster data are sent to a server member from the deployment manager. This metric determines how often cluster information is being propagated. The valid format is a positive integer.

Server Name The name of the WebSphere application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Server Response Time (ms) The response time (in milliseconds) at which IIOP requests were serviced by an application server, calculated based on the time the request is received versus the time the reply is sent. The valid format is a decimal (formatted to three decimal places).

Server Response Time Count The count of times that were used for Server Response Time. The valid format is a 4-byte integer. If the number is too big to be stored, a value of -2 is used.

Total Server Response (ms) The total response time (in milliseconds) at which IIOP requests were serviced by an application server. The valid format is a decimal (formatted to three decimal places).

Set Instrumentation Level Type Indicates the WebSphere resource category, which is used by the agent to modify the Instrumentation Level for transaction data collection.

WLM Clients Serviced The number of WLM-enabled clients this application server has serviced during the interval. The valid format is a positive integer.

WLM Clients Serviced Rate (per sec) The rate (per second) at which this server has serviced WLM-enabled clients during the sampling interval. The valid format is a decimal (formatted to three decimal places).

WLM Server Weight A control for work directed to the application server. If the server weight value is greater than the weight values assigned to other servers in the cluster, then the server receives a larger share of the cluster workload. The valid format is a positive integer.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Workplace Mail IMAP/POP attributes

The **Workplace Mail IMAP/POP** attributes displays the usage information for the IMAP service and POP3 service connectivity.

The attributes within this group are used to build the IMAP/POP workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling. Thus the attributes within this attribute group initially contain zeros until you select the workspace and then select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Important: This workspace does not support linking to ITCAM for Application Diagnostics Managing Server visualization engine.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Active Sessions The number of active sessions during the sampling interval. The valid format is a positive integer.

Active SSL Sessions The number of active, secure sessions during the sampling interval. The valid format is a positive integer.

Authentication Failures The number of authentications failures during the sampling interval. The valid format is a positive integer.

Connection (ms) The time (in milliseconds) spent connected to clients during the sampling interval. The valid format is a positive integer.

IMAP Instrumentation Level The instrumentation level for IMAP PMI module. Valid values are None, Low, Medium, High, Basic, Extended, All, Custom, and Maximum. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Peak Session load The maximum number of concurrent sessions during the sampling interval. The valid format is a positive integer.

POP Instrumentation Level The instrumentation level for POP PMI module. Valid values are None, Low, Medium, High, Basic, Extended, All, Custom, and Maximum. Blank if no instrumentation level is set.

Protocol The protocol type of the workplace mail. Valid values are IMAP and POP.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and

SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 65. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Successful Authentications The number of successful authentications during the sampling interval. The valid format is a positive integer.

Instrumentation Level The Instrumentation Level for this container. Valid fixed values None, Low, Medium, High, Basic, Extended, All, Custom, Maximum.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Workplace Mail Queues attributes

The **Workplace Mail Queues** attributes display information about the message delivery state, including ready, retry, unprocessed, and dead.

The attributes within this group are used to build the Messages Queues workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling. Thus the attributes within this attribute group initially contain zeros until you select the workspace and select again it later. Each time you select the workspace, these attributes are updated with the latest data.

Important: This workspace does not support linking to ITCAM for Application Diagnostics Managing Server visualization engine.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Dead The number of messages in the dead state in the queue during the sampling interval. The valid format is a positive integer.

Instrumentation Level The instrumentation level for the service components. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Queue The Lotus Workplace Mail queue name. Valid values are A, B, C, D, E, F, G, H, and Summary.

Ready The number of messages in the ready state in the queue during the sampling interval. The valid format is a positive integer.

Retry The number of messages in the retry state in the queue during the sampling interval. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 66. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Unprocessed The number of messages in the unprocessed state in the queue during the sampling interval. The valid format is a positive integer.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Workplace Mail Service attributes

The **Workplace Mail Service** attributes display aggregated usage information about the incoming mail message traffic.

The attributes within this group are used to build the Workplace Mail workspace.

Important:

- The attributes within this attribute group contain zeros for performance data if your site has set configuration value Resource Data Collection Method to On Demand (for on-demand sampling) and if you have not yet run applications that generate performance data. To report performance data in these attributes after installing and configuring the data collector, use the WebSphere administrative console to set the appropriate PMI instrumentation level.
- The Tivoli Enterprise Monitoring Agent is set by default to provide on-demand sampling. Thus the attributes within this attribute group initially contain zeros until you select the workspace and select it again later. Each time you select the workspace, these attributes are updated with the latest data.

Important: This workspace does not support linking to ITCAM for Application Diagnostics Managing Server visualization engine.

Tip: For information about WebSphere PMI metrics, see "WebSphere PMI Attribute Mapping" on page 373.

Active LDAP Connections The number of active LDAP connections during the sampling interval. The valid format is a positive integer.

Delivered Messages The total number of delivered messages during the sampling interval. The valid format is a positive integer.

Deliverer Dropped Messages The total number of messages rejected by the SMTP outbound server during the sampling interval. The valid format is a positive integer.

Deliverer Message (ms) The total time in milliseconds taken by SMTP outbound server to process messages during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Dropped SMTP Connections The total number of the dropped SMTP connections during the sampling interval. The valid format is a positive integer.

DSN Failure Messages The total number of failure DSNs sent during the sampling interval. The valid format is a positive integer.

Handled Messages The total number of messages processed by the mail handler server during the sampling interval. The valid format is a positive integer.

Handler Dropped Messages The total number of messages rejected by the mail handler server during the sampling interval. The valid format is a positive integer.

Instrumentation Level The instrumentation level for the service components. For WebSphere 6 or higher, the valid values are None, Basic, Extended, All, Custom. Blank if no instrumentation level is set.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Live SMTP Server Connections The number of live SMTP server connections during the sampling interval. The valid format is a positive integer.

Live SMTP Client Connections The number of live SMTP client connections during the sampling interval. The valid format is a positive integer.

Lost SMTP Client Connections The total number of lost SMTP client connections during the sampling interval. The valid format is a positive integer.

Lost SMTP Connections The total number of the lost SMTP connections during the sampling interval. The valid format is a positive integer.

Message Delivery (ms) The total time in milliseconds taken to deliver messages during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Messages Handling (ms) The total time in milliseconds taken to handle messages during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Peak LDAP Connections The maximum number of concurrent LDAP connections during the sampling interval. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 67. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute

Table 67. Format of the 12-character timestamp (continued)

Character String	Meaning
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Smarthost Messages The total number of messages sent to the Smarthost during the sampling interval. The valid format is a positive integer.

SMTP Client Connections The total number of SMTP client connections during the sampling interval. The valid format is a positive integer.

SMTP Client (ms) The total time in milliseconds taken to deliver messages during the sampling interval. The valid format is a decimal (formatted to three decimal places).

SMTP Connections The total number of connections to the SMTP server during the sampling interval. The valid format is a positive integer.

SMTP (ms) The total time in milliseconds that SMTP has conversed during the sampling interval. The valid format is a decimal (formatted to three decimal places).

SMTP Server Threads The number of active SMTP outbound server threads during the sampling interval. The valid format is a positive integer.

For more information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Agent Configuration attributes

The attributes in the Agent Configuration table are for internal use only.

Origin Node The server name subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Row Id The row identifier. The valid format is a 2-byte integer.

View Id The view identifier. The valid format is a 2-byte integer.

Act Id The act identifier. The valid format is a 2-byte integer.

Data The data string. The valid format is an alphanumeric string, with a maximum of 4096 characters.

KYN Command attributes

The attributes in the KYN command table are for internal use only.

Origin Node The origin node. The valid format is an alphanumeric string, with a maximum of 128 characters.

Command The command string. The valid format is an alphanumeric string, with a maximum of 256 characters.

User ID The user ID. The valid format is an alphanumeric string, with a maximum of 16 characters.

Result Status The result status code. The valid format is a 4-byte integer.

Server Configuration attributes

The attributes in the Server Configuration table are for internal use only.

Origin Node The server name subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Row Id The row identifier. The valid format is a 2-byte integer.

View Id The view identifier. The valid format is a 2-byte integer.

Act Id The act identifier. The valid format is a 2-byte integer.

Data The data string. The valid format is an alphanumeric string, with a maximum of 4096 characters.

Situations for ITCAM Agent for WebSphere Applications

IBM Tivoli Composite Application Manager Agent for WebSphere Applications has a number of predefined situations that you can use to complete the following tasks:

- Monitor your WebSphere application servers
- Monitor and manage widely dispersed WebSphere application server resources through localized automation
- Create your own situations using the predefined situations as examples

These predefined situations display an alert status. When these situations trigger an alert, you can investigate the event by opening its workspace. For example, you can use these situations to monitor a WebSphere application server for errors occurring within it or web applications based at your site.

How the situations work

Situations are tests expressed in IF-TRUE format of system conditions that you want to monitor; the tested value is an ITCAM Agent for WebSphere Applications attribute expressed in the form *attribute-group.attribute-name*. If the specified condition occurs or exists, the situation is true, and an alert is issued.

Avoid using negative values

If you define situations that use a counter or a range of numbers, always provide a threshold or use values in a positive range of numbers. For example, use a greater-than-or-equal-to-zero expression as shown in some of the following predefined situations. This practice prevents a situation from falsely tripping. If the ITCAM Agent for WebSphere Applications Tivoli Enterprise Monitoring Agent encounters an undefined attribute value, it interprets this value as a negative number and erroneously fires a situation that specifies a negative number.

Important: For the following situations:**WASDBConPAvgWaitTimeHigh DB_Connection_Pools**,**J2C_Connection_Pools** and **Thread_PoolsApplication** the **Application ID** column is not supported and always displays -1 by default.

Accessing the situations

Some of the predefined situations run by default from the WebSphere Agent. For the situations that do not run automatically, you must start these situations manually. To start these situations, access the situations in the Tivoli Enterprise Portal using one of the following methods:

- In the WebSphere agent, right-click the specific server. Right-click **Enterprise** then, click **Manage Situations** to display all the managed situations available on the server. If you want to start, stop, edit, or model a situation, right-click the situation and select the option you want.
- From the toolbar on the main menu, click the Situation Editor icon  and scroll to the situation that you want to view.

For information about predefined situations and formulas see "Predefined situations-descriptions and formulas (that run automatically)" and "Predefined situations descriptions and formulas (that run manually)" on page 283. See also "Attributes for ITCAM Agent for WebSphere Applications" on page 139.

Predefined situations-descriptions and formulas (that run automatically)

The following predefined situations run automatically from the WebSphere Agent and support the following applications servers unless stated otherwise.

- WebSphere application server
- WebSphere application server portal
- WebSphere application server Process
- WebSphere application server ESB
- Lotus Workplace server

Tip:

- To start, stop, or edit any of these situations, see "Accessing the situations."
- For information about situations that run manually, see "Predefined situations descriptions and formulas (that run manually)" on page 283.

WASAppDiscovered monitors WebSphere applications deployed in the application server and issues an Informational alert when a new application is discovered. The monitoring agent checks for new applications each time it connects to the data collector or when an application is deployed when the data collector is already active. The formula is:

If

Application_Monitoring_Configuration.Monitoring_Status equals Discovered

then

the situation WASAppDiscovered is true.

Important: This situation does not support Lotus Workplace server.

The predefined **Take Action** command **Start_Baselining** associated with the WASAppDiscovered situation enables you to automate the baselining of newly discovered applications.

WASAppHealthBad monitors the overall application health and issues a Critical alert when the application health is bad. The formula is:

If

Application_Health_Status.Web_Tier_Health equals Bad

then

the situation WASAppHealthBad is true.

The predefined **Take Action** command **Set_Appliction_Monitoring** associated with WASAppHealthBad situation increases the request monitoring rate for applications generated alert. This command enables you to collect more detailed performance data and helps to collect the most precise data about each application tier health level.

WASAppHealthFair monitors the overall application health and issues a warning alert when application health is fair. The formula is:

If

Application_Health_Status.Application_Health equals Fair

then

the situation WASAppHealthFair is true.

The predefined **Take Action** command **Set_Appliction_Monitoring** associated with WASAppHealthFair situation raises the request monitoring level for applications generated alert. This command enables you to collect detailed performance data that helps to pinpoint a bottleneck down to particular application tiers.

WASAppHealthGood monitors the overall application health and issues an Informational alert when application health is good. The formula is:

If

Application_Health_Status.Application_Health equals Good

then

the situation WASAppHealthGood is true.

The predefined **Take Action** command **Set_Appliction_Monitoring** associated with the WASAppHealthGood situation lowers the request monitoring level for applications generated alert, and reduces the monitoring workload.

WASError monitors the error severity for a single WebSphere application server and issues a Critical condition whenever that severity is greater than 21. Its formula is:

If

Log_Analysis.Severity is greater than Warning

then

the situation WASError is true.

WASHighCPUPercentUsed monitors the percentage of the CPU being consumed and issues a Critical condition whenever that time exceeds 80%. The formula is:

If

Application_Server.CPU_Used_Percent is greater than 80

then

the situation WASHighCPUPercentUsed is true.

WASHighGCTimePercent monitors the percentage of time being spent by the garage collector and issues a Critical condition whenever that time exceeds 80%. The formula is:

If

Garbage_Collection_Analysis.Real_Time_Percent is greater than 80

then

the situation WASHighGCTimePercent is true.

WASHighResponseTime monitors the average request response time and issues a Critical condition whenever that time exceeds 2 seconds. The formula is:

If

Request_Times_and_Rates.Average_Request_Response_Time is greater than 2000

then

the situation WASHighResponseTime is true.

WASNotConnected monitors the connection between the ITCAM for Data Collector WebSphere running in an application server and the ITCAM Agent for WebSphere Applications monitoring agent to ensure that the monitoring agent is connected and issues a Critical condition whenever it is not. Its formula is:

If

Application_Server_Status.Status equals Disconnected

then

the situation WASNotConnected is true.

WASOutofHeapSpace monitors the heap allocation status and issues a Critical condition whenever heap space is exhausted. The formula is:

If

Allocation_Failure.Heap_Status equals Out of heap space or Insufficient space

then

the situation WASOutofHeapSpace is true.

Important: This situation is not available when monitoring non-IBM Java Virtual Machines, including machines commonly used on HP-UX and Solaris platforms.

WASAvgHeapSizeAfterGCHigh monitors the average heap size free percentage after garbage collection. This situation issues a Critical alert if the average heap size free percentage after garbage collection is greater than 80%. Its formula is:

If

Garbage_Collection_Cycle.Heap_Free_Percent_after_GC is greater than 80

then

the situation WASAvgHeapSizeAfterGCHigh is true.

Important: This situation does not support Lotus Workplace server.

WASJ2CConnectionPoolUsageMaxed monitors the J2C pool percentage usage and issues a Warning alert if the pool usage is greater than or equal to 100%. Its formula is:

If

J2C_Connection_Pools.Pool_Used_Percent is greater than or equal to 100%

then

the situation WASJ2CConnectionPoolUsageMaxed is true.

Important: This situation does not support Lotus Workplace server.

WASDBConnectionPoolUsageMaxed monitors the JDBC pool usage and issues a Critical alert if the pool usage is greater than or equal to 100%. Its formula is:

If

DB_Connection_Pools.Percent_Used is greater than or equal to 100%

then

the situation WASDBConnectionPoolUsageMaxed is true.

Important: This situation does not support Lotus Workplace server.

WASHungThreadsDetected monitors hung threads and issues a Critical alert if any thread is hung. Its formula is:

If

Application_Server.Hung_Threads_Total is greater than 0

then

the situation WASHungThreadsDetected is true.

WASListenerPortStarted monitors starting of the WAS listener port. Its formula is:

If

Listener_Port.Status equals Started

then

the situation WASListenerPortStarted is true.

WASListenerPortStopped monitors stopping of the WAS listener port and issues a Critical alert if the port is stopped. Its formula is:

If

Listener_Port.Status equals Stopped

then

the situation WASListenerPortStopped is true.

See also "Attributes for ITCAM Agent for WebSphere Applications" on page 139.

Predefined situations descriptions and formulas (that run manually)

Situations that are run manually

The following situations do not run automatically. To run them you must access them from the **Manage Situations** view. These situations support the following application servers unless stated otherwise:

- WebSphere application server
- WebSphere application server portal
- WebSphere application server Process
- WebSphere application server ESB
- Lotus Workplace server

Tip:

- To start, stop, or edit any of these situations, see "Accessing the situations" on page 279.
- For information about situations that run automatically, see "Predefined situations-descriptions and formulas (that run automatically)" on page 279.

WASDBConnectionPoolThrdTimeout monitors the thread timeout count. This situation issues a Critical condition whenever the timeout count is greater than zero. Its formula is:

If

DB_Connection_Pools.Threads_Timed_Out is greater than 0

then

the situation WASDBConnectionPoolThreadTimeout is true.

WASContainerTransactionRollback monitors the rollback count of the WebSphere application server. This situation issues a Critical alert whenever the count becomes nonzero. Its formula is:

If

Container_Transactions.Global_Transactions_Rolled_Back is greater than 0

or

Container_Transactions.Local_Transactions_Rolled_Back is greater than 0

then

the situation WASContainerTransactionRollBack is true.

WASEJBCreateTimeHigh monitors the average time of a bean create call and issues a Critical alert when the time is longer than 2 seconds. Its formula is:

If

Enterprise_Java_Beans.Create_Average_Time is greater than 2000

then

the situation WASEJBCreateTimeHigh is true.

Important: This situation does not support Lotus Workplace server.

WASEJBRemoveTimeHigh monitors the average time of a bean remove call and issues a Critical alert when the time is longer than 2 seconds. Its formula is:

If

Enterprise_Java_Beans.Remove_Average_Time is greater than 2000

then

the situation WASEJBRemoveTimeHigh is true.

Important: This situation does not support Lotus Workplace server.

WASEJBMethodResponseTimeHigh monitors the average response time on remote interface methods for all beans. This situation issues a Critical alert if the response time is longer than 2 seconds. Its formula is:

If

Enterprise_Java_Beans.Method_Average_Response_Time is greater than 2000

then

the situation WASEJBMethodResponseTimeHigh is true.

Important: This situation does not support Lotus Workplace server.

WASThreadFreeLow monitors the average free threads in the pool and issues a Critical alert if the number of threads is less than 200. Its formula is:

If

Thread_Pools.Average_Free_Threads is greater than or equal to 0

and

Thread_Pools.Average_Free_Threads is less than 200

and

Thread_Pools.Average_Active_Threads is greater than or equal to 0

then

the situation WASThreadFreeLow is true.

Important: This situation does not support Lotus Workplace server.

WASDataSrcConWaitTimeHigh monitors the average time an application has to wait for a connection. This situation issues a Critical alert if the wait time is longer than 2 seconds. Its formula is:

If

Datasources_Connection_Average_Wait_Time is greater than 2000

then

the situation WASDataSrcConWaitTimeHigh is true.

Important: This situation does not support Lotus Workplace server.

WASReqSQLExecuteTimePercentHigh monitors the percentage of time the request spends executing a JDBC database. This situation issues a Critical alert if the percentage of time is higher than 80%. Its formula is:

If

Request_Analysis.SQL_Execute_Time_Percent is greater than 80

then

the situation WASReqSQLExecuteTimePercentHigh is true.

Important: This situation does not support Lotus Workplace server.

WASReqSQLQueryTimePercentHigh monitors the percentage of time the request spends querying a JDBC database. This situation issues a Critical Alert if the percentage of time is higher than 80%. Its formula is:

If

Request_Analysis.SQL_Query_Time_Percent is greater than 80

then

the situation WASReqSQLQueryTimePercentHigh is true.

Important: This situation does not support Lotus Workplace server.

WASReqSQLUpdateTimePercentHigh monitors the percentage of time the request spends updating a JDBC database. This situation issues a Critical Alert if the percentage of time is higher than 80%. Its formula is:

If

Request_Analysis.SQL_Update_Time_Percent is greater than 80

then

the situation WASReqSQLUpdateTimePercentHigh is true.

Important: This situation does not support Lotus Workplace server.

WASDBConPAverageUsageTimeHigh monitors the average time that a connection in use is high. This situation issues a Critical alert if the average time the connection in use is longer than 2 seconds. Its formula is:

If

DB_Connection_Pools.Average_Usage_Time is greater than 2000

then

the situation WASDBConPAverageTimeHigh is true.

Important: This situation does not support Lotus Workplace server.

If

DB_Connection_Pools.Percent_Used is greater than 80

then

the situation WASDBConPPercentUsedTimeHigh is true.

Important: This situation does not support Lotus Workplace server.

WASDBConPAvgWaitTimeHigh monitors the average time that a client has to wait for a connection. This situation issues a Critical alert when the time period is longer than 2 seconds. Its formula is:

If

DB_Connection_Pools.Average_Wait_Time is greater than 2000

then

the situation WASDBConPAvgWaitTimeHigh is true.

Important: This situation does not support Lotus Workplace server.

WASJ2CCPAverageUsageTimeHigh monitors the average time that connections are in use (it measures from when the connection is allocated to when it is returned). This situation issues a Critical alert when the combined connection allocation and return time are longer than 2 seconds. Its formula is:

If

J2C_Connection_Pools.Average_Usage_Time is greater than 2000

then

the situation WASJ2CCPAverageUsageTimeHigh is true.

Important: This situation does not support Lotus Workplace server.

WASJ2CCPAvgWaitTimeHigh monitors the average wait time until a connection is granted. This situation issues a Critical alert if the time period is longer than 2 seconds. Its formula is:

If

J2C_Connection_Pools.Average_Wait_Time is greater than 2000

then

the situation WASJ2CCPAvgWaitTimeHigh is true.

Important: This situation does not support Lotus Workplace server.

WASCTGlbTransDurationHigh monitors the average duration of global transactions. This situation issues a Critical alert if the time period is longer than 2 seconds. Its formula is:

If

Container_Transactions.Global_Transaction_Duration is greater than 2000

then

the situation WASCTGlbTransDurationHigh is true.

Important: This situation does not support Lotus Workplace server.

WASCTLclTransDurationHigh monitors the average duration of local transactions. This situation issues a Critical alert if the time period is longer than 2 seconds. Its formula is:

If

Container_Transactions.Local_Transaction_Duration is greater than 2000

then

the situation WASCTLclTransDurationHigh is true.

Important: This situation does not support Lotus Workplace server.

WASPortalPageResponseTime monitors the portal page response time and issues a Critical alert when the average request response time is higher than 2 seconds. The formula is:

If

Portal_Page_Summary.Average_Response_Time is greater than 2000

then

the situation WASPortalPageResponseTime is true.

WASPortletResponseTime monitors the portlet response time and issues a Critical alert when the average request response time is higher than 2 seconds. The formula is:

If

Portlet_Summary.Average_Response_Time is greater than 2000

then

the situation WASPortletResponseTime is true.

WASServletsJSPsError monitors the error count for servlets and JSPs invoked by a WebSphere application server application. This situation issues a Critical condition whenever the count becomes nonzero. Its formula is:

If

Servlets_JSPs.Error_Count is greater than 0

then

the situation WASServletsJSPsError is true.

Important: This situation does not support Lotus Workplace Server.

WASSrvlSessAvgActiveSessionHigh monitors the average number of concurrently active sessions. This situation issues a Critical alert if the average number of concurrently active sessions is greater than 100. Its formula is:

If

Servlet_Sessions.Average_Concurrently_Active_Sessions is greater than 100

then

the situation WASSrvlSessAvgActiveSessionHigh is true.

The following situations are configured to run automatically.

Important: This situation does not support Lotus Workplace server.

WASSrvlSessExtReadTimeHigh monitors the time it takes to read the session data from the persistent store. This situation issues a Critical alert if the time period is longer than 2 seconds. Its formula is:

If

Servlet_Sessions.External_Read_Time is greater than 2000

then

the situation WASSrvlSessExtReadTimeHigh is true.

Important: This situation does not support Lotus Workplace server.

WASSrvlSessExtWriteTimeHigh monitors the time it takes to write session data to persistent store. This situation issues a Critical alert if the time period is longer than 2 seconds. Its formula is:

If

Servlet_Sessions.External_Write_Time is greater than 2000

then

the situation WASSrvlSessExtReadTimeHigh is true.

Important: This situation does not support Lotus Workplace server.

WASThreadPoolPercentMaxed monitors the average usage time of all threads, and issues a Critical condition whenever that time exceeds 100%. The formula is:

If

Thread_Pools.Percent_of_Time_Pool_at_Max is greater than 100

then

the situation WASThreadPoolPercentMaxed is true.

WASWebApplicationError monitors the error log status of the WebSphere server and issues a Critical condition when an error occurs. Its formula is:

If

Web_Applications.Error_Count is greater than 0

then

the situation WASWebApplicationError is true.

Important: This situation does not support Lotus Workplace Server.

See also "Attributes for ITCAM Agent for WebSphere Applications" on page 139.

Take Action commands for ITCAM Agent for WebSphere Applications

The Take Action feature lets your interactive Tivoli Enterprise Portal users enter a command or stop or start a process at any system in your network where one or more Tivoli Enterprise Monitoring Agents are installed. The ITCAM Agent for WebSphere Applications Take Action commands enable you use the Tivoli Enterprise Portal interface to start, stop, or recycle a WebSphere application server or to control the level of monitoring for the current server.

Users can start a Take Action command from a workspace, from the Navigator, from a situation that you create, on demand, or by recalling a saved Take Action command.

Note:

The following take action commands are for internal use only and are not for use in the Tivoli Enterprise Portal. The configuration workspaces use these take action commands to communicate internally with the monitoring agent.

- **`Configure`**
- **`ConfigureCancel`**
- **`ConfigurePing`**

Add_XD_Cell: Add an XD Cell to a WebSphere agent

Use the Add_XD_Cell command to add an XD cell to the WebSphere Agent. This take action task is used to configure XD Cell monitoring.

Command syntax

YN:AddXDCell *cellName*

where *cellName* is the name of the XD cell.

Enable_Auto_Threshold: set threshold parameters

Use the Enable_Auto_Threshold Take Action to set automatic threshold parameters and remove any overrides of the thresholds.

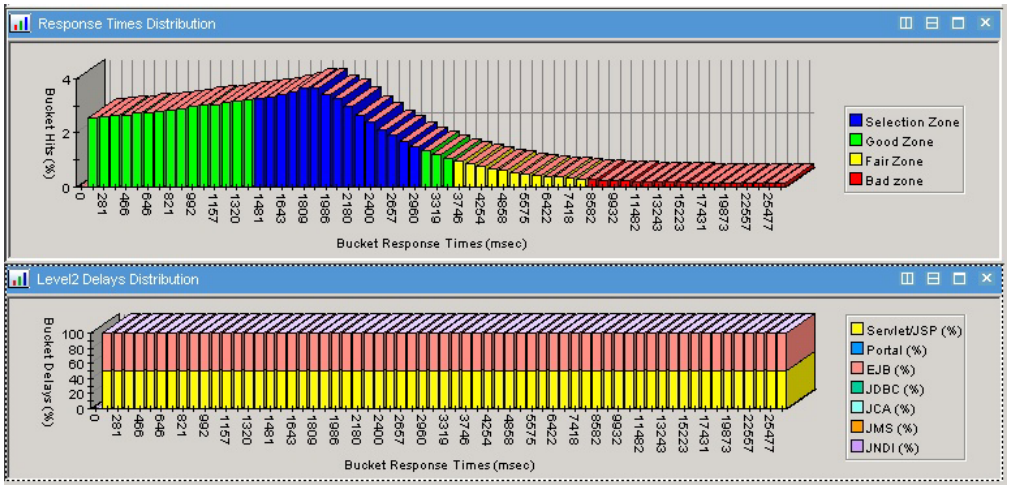
The baselining process supplies statistical information about request response times. ITCAM interprets this information to set automatic thresholds. Several parameters control this interpretation.

The default values for these parameters are sufficient for most cases. However, if the thresholds are not adequate and the baselining process was run recently, you might have to change these parameters. If there are many false alarms or warnings, you must raise the bad or fair threshold; if alarms or warnings are not triggered when needed, you must lower the bad or fair threshold.

Although you can change the parameters for the entire application or for all requests of a given type, most likely you do this only for an individual request.

- To set threshold parameters for all requests in the application, select this application in the "Application Health workspace" on page 73 or "Application Registry workspace" on page 75, and select the Enable_Auto_Threshold take action command.
- To set threshold parameters for all requests of a given type in the application, select this request type in the Application Request Configuration table of the "Application Configuration workspace" on page 111, and select the Enable_Auto_Threshold take action command.
- To set threshold parameters for an individual request, select this request in the "Request Baseline workspace" on page 109, and select the Enable_Auto_Threshold take action command.

In the "Request Baseline workspace" on page 109, when you select a line representing a request, you can see the bar charts representing statistical data for this request. This data was gathered during the baselining process. Colors on the bar charts show the way in which the parameters are applied. You can change the parameters using the Enable_Auto_Threshold take action command, and immediately see the effects on the bar charts.



The **Response Times Distribution** chart shows the statistical distribution of response times for this request. The height of every bar shows the percentage of requests that had the indicated response time during the baselining period.

Some bars represent bigger time intervals than others; more bars are devoted to most common response times. For example, if the maximum encountered time is 1000 ms but most response times are 300 - 500 ms, then the first bar can be 0 - 50 ms, but there can also be bars of 305 - 310 ms and 400 - 402 ms.

The bars colored blue show the zone into which the "typical" response times for this application fall. The green bars show response times that are not "typical", but

are below the fair threshold. Response times above the fair threshold but below the bad threshold are shown as yellow bars; for those above the bad threshold, the bars are red.

Use the Enable_Auto_Threshold take action command to set the parameters that affect both the position of the "typical" zone and the way the thresholds are derived from this zone.

For more information about how the bar chart and parameters work, see “Threshold calculation detail” on page 300.

The **Level2 Delays Distribution** chart shows the distribution of time spent in "nested requests" within the requests that had this response time range. Each bar represents a response time of the top-level request . Within this bar, colored sections show how much time is spent within nested requests of different types; the color legend is shown on the bar. ITCAM uses this distribution within the selection zone (that is for typical overall request types) to work out the average share of time that each nested request type takes. When an error or warning arises, ITCAM checks which of the request types takes more than its usual share of time; based on this, it displays whether the likely cause is the application, backend, or server.

Command syntax

YN:Enable_Auto_Threshold *App_Id Request_Id Auto_Threshold_Percent Auto_Threshold_Deviation Auto_Threshold_Fair_Projection Auto_Threshold_Bad_Projection Use_Default*

Parameters:

App_Id
The application ID, automatically assigned in the portal from the selection context when Take Action was invoked.

Request_Id
The request ID, automatically assigned in the portal from the selection context when Take Action was invoked.

Auto_Threshold_Percent
Auto_Threshold_Deviation
ITCAM uses these two parameters to calculate the borders of the "typical zone". See “Threshold calculation detail” on page 300.

Auto_Threshold_Fair_Projection
This determines the position of the fair threshold. Increase this parameter to increase the fair threshold; decrease the parameter to decrease the fair threshold. For details, see “Threshold calculation detail” on page 300. The bad threshold is not affected.

Auto_Threshold_Bad_Projection
This determines the position of the bad threshold. Increase this parameter to increase the bad threshold; decrease the parameter to decrease the bad threshold.For details, see “Threshold calculation detail” on page 300. The fair threshold is not affected.

Use_Default
If set to 0, the auto threshold settings are modified according to the other parameters in this Take Action. If set to 1, the value of the auto threshold

settings for this request are taken from the "parent": the values that have been set for the request type, for the entire application, or the ITCAM default values.

Example: YN:Enable_Auto_Threshold 1 12 50 200 150 300 0

Override_Auto_Threshold: override threshold values

Use the Override_Auto_Threshold Take Action to override fair and bad response time threshold values for any request in the application. In this case, while the baselining statistical data is still preserved, ITCAM does not use automatically calculated thresholds.

Do not override threshold values unless you have analyzed the application performance in detail (or were instructed to override threshold values by IBM Level 3 Support). To adjust threshold values without manually overriding them, see “Enable_Auto_Threshold: set threshold parameters” on page 290.

To remove an override, select a request in the “Request Baseline workspace” on page 109, and select the Enable_Auto_Threshold take action command. Leave all parameters as they are, in order to use the same auto threshold parameters as were used before the override. If you need to change these parameters, see “Enable_Auto_Threshold: set threshold parameters” on page 290.

Command syntax

YN:Override_Auto_Threshold *App_Id Request_Id Fair_Response_Threshold Bad_Response_Threshold*

Parameters:

App_Id
The application ID, automatically assigned in the portal from the selection context when Take Action was invoked.

Request_Id
The request ID, automatically assigned in the portal from the selection context when Take Action was invoked.

Fair_Response_Threshold
The fair response time threshold, in milliseconds.

Bad_Response_Threshold
The bad response time threshold, in milliseconds.

Remove_WebSphere_SubNode: Remove an inactive WebSphere application server

Use the Remove_WebSphere_SubNode command to remove a no-longer-active WebSphere application server from the Navigator tree.

Command syntax

If invoked from the Navigator WebSphere Agent entry, the syntax is:

YN:RemSubNode *server_name*

where *server_name* is the WebSphere server-that is, subnode-name.

If, however, this command is invoked from a subnode of the Navigator WebSphere Agent entry, the syntax is:

YN:RemSubNode

In this case, *server_name* is not required because the subnode name-that is, the server name-is already known.

Set_Application_Monitoring: Set monitoring

Use the Set_Application_Monitoring command to set monitoring of the WebSphere application.

Command syntax

YN:Set_Application_Monitoring *App_Id Monitoring_Enabled Request_Data_Monitoring_Level Request_Data_Sampling_Rate*

where *App_Id* is the application ID which is automatically assigned in the portal from the selection context when Take Action was invoked.

Monitoring_Enabled is a boolean value and the valid values are 0 and 1. It defines whether the monitoring agent application dashboard monitoring feature is enabled for the given application.

Request_Data_Monitoring_Level is an integer value that defines custom request monitoring level for the given application. Valid values are 0 (DISABLE), 1 (LEVEL1), and 2 (LEVEL2). If the Request Monitoring Control Level (see "Application Dashboard (Basic) tab" on page 59) is set to Application, this level overrides any level that the user might set for the entire monitoring agent.

Important: If the Request Monitoring Control Level is set to Server, this Take Action command has no effect on the actual monitoring level. The new level is recorded, but the server-wide setting is applied. If you change the Request Monitoring Control Level to Application, the recorded application monitoring level takes effect.

Request_Data_Sampling_Rate is an integer value that defines custom request monitoring rate (in percentage) for the given application. Valid values range from 0 to 100.

Important: When this Take Action is selected for a node representing a z/OS servant region, it applies to all servant regions in the same managed system (IBM WebSphere application server instance).

Reflex _Automation_Mode is a boolean value and the valid values are 0 and 1. When you select 1, WR application health monitoring accepts reflex automation commands from WASAppHealthGood/Fair/Bad situations and adjusts the monitoring level automatically based on the current application health status. For more information about Tivoli Monitoring (ITM) reflex automation, search for 'reflex automation' in the IBM Tivoli Monitoring Version 6.2.3 info center

Set_Completion_Thresholds: Set completion thresholds

Use the Set_Completion_Thresholds command to define the thresholds of the error rate for the WebSphere application.

Command syntax

YN:Set_Completion_Thresholds *App_Id Fair_Completion_Rate Bad_Completion_Rate*

where *App_Id* is the application ID which is automatically assigned in the portal from the selection context when Take Action was invoked.

Fair_Completion_Rate and *Bad_Completion_Rate* are the values in percentage that define thresholds for fair and bad requests completion rates.

Set_Request_Sampling_Rate: Set the sampling rate for request data

Use the Set_Request_Sampling_Rate command to define the percentage of requests to monitor.

Command syntax

YN:SetRequestSamplingRate *percent*

where *percent* is the percentage of requests you want sampled, an integer from 1 to 100.

Important: This command sets the default sampling rate for a server. This rate is applied to new applications that are detected on this server after you run the command. To change the sampling rate for an existing application, use the command "Set_Application_Monitoring: Set monitoring" on page 294.

Start_Baselining: Start the baselining process

ITCAM can run a *baselining process* for every application. During this process, which runs for a preset period, the data collector collects statistical data on metric values for a given period. Based on this statistical data, the monitoring agent can automatically set the fair and bad thresholds, as well as the typical breakdown of response times for nested requests. Use the Start_Baselining Take Action to start the baselining process.

When ITCAM begins monitoring an application for the first time, it automatically starts this process for the application. However, with time, average response times can change because of configuration, load pattern, database size, and other issues. You can manually start the baselining process again to take these changes into account. You can also use IBM Tivoli Monitoring (ITM) policies and workflow management to run the baselining process every few months.

As soon as you take the Start Baselining action, the baselining process begins. The thresholds are updated when either the Period or the Update Interval passes.

While the baselining process is running, you can trigger a baseline update to immediately set the thresholds based on the information collected so far.

Command syntax

YN:Start_Baselining *App_Id Period Update_Interval Run_Clean*

Parameters:

App_Id
The application ID, automatically assigned in the portal from the selection context when Take Action was invoked.

Period
The time for which the baselining process runs. The data collector collects the necessary statistical information for this entire period. When ITCAM starts the baselining process automatically, it sets the period to seven days. The format is `ddd/hh:mm:ss`.

Update_Interval
If you set this parameter to a time interval, ITCAM updates the thresholds according to the information already collected every time this interval passes. For example, when ITCAM starts the baselining process automatically, it sets the update interval to 1 hour. During the seven days that the initial baselining runs, every hour the thresholds are updated according to the statistical data collected so far (for all request types where at least one request was received during the baselining process). The format is `ddd/hh:mm:ss`.

Run_Clean
Set to either 0 or 1. If set to 0, statistical data collected in any previous baselining for the same requests are kept and "amalgamated" with the new data. If set to 1, only the new data are used for setting the thresholds. Normally, you set this to 1.

Note: When this Take Action command is selected for a node representing a z/OS servant region, it applies to all servant regions in the same managed system (IBM WebSphere application server instance).

Start_GC_Monitoring: Begin reporting garbage-collection data

Use the Start_GC_Monitoring command to activate the display of garbage-collection statistics. This setting is in addition to the WebSphere application server Verbose Garbage Collection value, which must also be active for garbage-collection data to be reported.

Command syntax

YN:StartGCMonitor

Important: When this Take Action command is selected for a node representing a z/OS servant region, it applies to all servant regions in the same managed system (IBM WebSphere application server instance).

Start_Request_Monitoring : Begin reporting request data

Use the Start_Request_Monitoring command to activate the display of request data.

Command syntax

YN:StartRequestMonitor *level*

where *level* is the resource-data collection level, either Level1 or Level2. When the collection level is set to Level1, only edge request data-such as servlets and JSPs-are collected. When set to Level2, nested request data, such as JDBC and JMS requests, are also collected.

If the Request Monitoring Control Level (see "Application Dashboard (Basic) tab" on page 59) is set to Server, this level applies to all applications monitored on the server.

Important: If the Request Monitoring Control Level is set to Application, you can set the monitoring level for any operation separately, using the "Set_Application_Monitoring: Set monitoring" on page 294 Take Action command. The monitoring level from the Start_Request_Monitoring Take Action command is applied by default to newly discovered applications.

Important: When this Take Action command is selected for a node representing a z/OS servant region, it applies to all servant regions in the same managed system (IBM WebSphere application server instance).

Start_Resource_Monitoring: Begin reporting PMI data

Use the Start_Resource_Monitoring command to activate the display of resource (that is, PMI) data. This setting is in addition to the WebSphere application server PMI instrumentation levels, which must also be set for resource data to be reported.

Command syntax

YN:StartResourceMonitor

Important: When this Take Action command is selected for a node representing a z/OS servant region, it applies to all servant regions in the same managed system (IBM WebSphere application server instance).

Start_WebSphere_Server: Start a WebSphere application server

Use the Start_WebSphere_Server command to start a WebSphere application server.

Command syntax

If invoked from the Navigator WebSphere Agent entry, the syntax is:

YN:StartAppSvr *server_name* *user* *password*

where *server_name* is the WebSphere server name, and *user* and *password* are your own WebSphere application server identifiers set via the WebSphere administrative console (required only if WebSphere global security is enabled).

If, however, this command is invoked from a subnode of the Navigator WebSphere Agent entry, the syntax is:

YN:StartAppSvr *user* *password*

where *user* and *password* are your own WebSphere application server identifiers set via the WebSphere administrative console; these are required only if WebSphere global security is enabled. (In this case, *server_name* is not required because the subnode name-that is, the server name-is already known.)

Stop_Baselining: stop the baselining process

Use the Stop_Baselining Take Action command to immediately stop the baselining process for an application, and recalculate the thresholds based on the request data available up to this point.

Normally you do not have to complete this action. To recalculate the thresholds based on the request data available up to this point, without stopping the baselining process, see "Update_Baseline: trigger a baseline update" on page 299.

Command syntax

YN:Stop_Baselining *App_Id*

Parameters:

App_Id
The application ID, automatically assigned in the portal from the selection context when Take Action was invoked.

Important: When this Take Action command is selected for a node representing a z/OS servant region, it applies to all servant regions in the same managed system (IBM WebSphere application server instance).

Stop_GC_Monitoring: Stop reporting garbage-collection data

Use the Stop_GC_Monitoring command to end the display of garbage-collection statistics.

Command syntax

YN:StopGCMonitor

Important: When this Take Action command is selected for a node representing a z/OS servant region, it applies to all servant regions in the same managed system (IBM WebSphere application server instance).

Stop_Request_Monitoring: Stop reporting request data

Use the Stop_Request_Monitoring command to end the display of request data.

Command syntax

YN:StopRequestMonitor

Important: When this Take Action command is selected for a node representing a z/OS servant region, it applies to all servant regions in the same managed system (IBM WebSphere application server instance).

Stop_Resource_Monitoring: Stop reporting PMI data

Use the Stop_Resource_Monitoring command to end the display of resource (that is, PMI) data.

Command syntax

YN:StopResourceMonitor

Important: When this Take Action command is selected for a node representing a z/OS servant region, it applies to all servant regions in the same managed system (IBM WebSphere application server instance).

Stop_WebSphere_Server: Stop a WebSphere application server

Use the Stop_WebSphere_Server command to stop an application server.

Command syntax

If invoked from the Navigator WebSphere Agent entry, the syntax is:

YN:StopAppSvr *server_name* *user* *password*

where *server_name* is the WebSphere server name, and *user* and *password* are your own WebSphere application server identifiers set through the WebSphere administrative console (required only if WebSphere global security is enabled).

If, however, this command is invoked from a subnode of the Navigator WebSphere Agent entry, the syntax is:

YN:StopAppSvr *user* *password*

where *user* and *password* are your own WebSphere application server identifiers set through the WebSphere administrative console; these are required only if WebSphere global security is enabled. (In this case, *server_name* is not required because the subnode name-that is, the server name-is already known.)

Update_Baseline: trigger a baseline update

If the baselining process is running, the thresholds are set automatically when either the Period or the Update Interval passes. For the initial baselining process, the first automatic update happens after one hour. With the Update_Baseline Take Action, you can force ITCAM to update the thresholds immediately, based on the information collected so far. This can be useful if you do not want to wait for the periodic automatic update. When the automatic update time comes, the threshold is updated again.

If a baselining process is not running for the application, an error is raised. If no requests of a given request type have been received since the baselining process has started, the update has no effect for this request type.

Command syntax

YN:Update_Baseline *App_Id*

Parameters:

App_Id
The application ID, automatically assigned in the portal from the selection context when Take Action was invoked.

Important: When this Take Action command is selected for a node representing a z/OS servant region, it applies to all servant regions in the same managed system (IBM WebSphere application server instance).

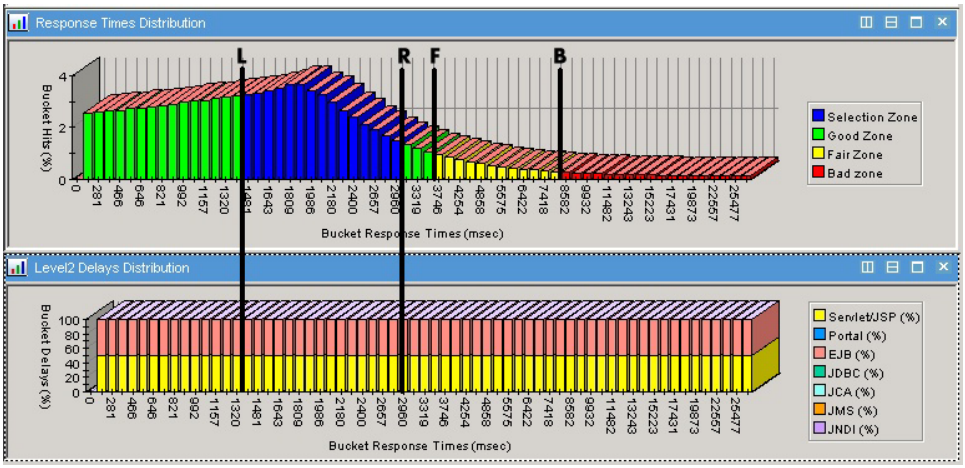
Threshold calculation detail

If you want to set parameters that affect the calculation of the automatic response time thresholds, you might need to know the details of this calculation.

ITCAM processes the baselining statistical data and applies the auto threshold parameters in the following way. The parameters are set in the Enable_Auto_Threshold take action command, see “Enable_Auto_Threshold: set threshold parameters” on page 290.

1. The response time results are sorted into up to 64 "buckets", from zero to the maximum response time encountered for this request. The buckets do not represent equal time intervals; for response time regions where most of the "hits" fall, the buckets represent smaller intervals. For example, if the maximum encountered time is 1000 ms but most response times are 300 - 500 ms, then the first bucket might be 0 - 50 ms, but there can also be buckets representing response times of 305 - 310 ms and 400 - 402 ms. ITCAM distributes the bucket borders so that the largest number of hits in any one bucket is not more than three times the number of hits in the smallest bucket.

   ITCAM calculates the percentage of the total amount of requests that fall into each response time bucket. ITCAM then divides it by the time interval width represented by the bucket. This is shown on the **Response Times Distribution** bar chart in the “Request Baseline workspace” on page 109.



   Each bar represents a bucket, and the bar height shows the percentage of the requests in this bucket. All the subsequent calculations are rounded up to buckets.

2. ITCAM determines the selection zone, which contains the "typical" response time values. This zone is represented by the bars colored blue on the chart.

   ITCAM finds the response time interval (left border L to right border R) where the following statements are true:

   - The percentage of hits that fall into this interval is no less than the Auto_Threshold_Percent parameter.
   - The spread of the time interval, calculated as (R/L)*100 - 100, is not greater than the Auto_Threshold_Deviation parameter.

     Important: The Auto_Threshold_Deviation parameter does not denote the statistical definition of deviation.

If several zones match these criteria, ITCAM chooses the one where the following value is the greatest: S/(R-L), where S is the total number of hits that fell into this zone.

If a zone where both requirements are true cannot be found at all, ITCAM first determines the interval where the percentage of hits is not less than the Auto_Threshold_Percent parameter while the spread is as little as possible. Then, within this interval, it finds a zone where the spread is not greater than the Auto_Threshold_Deviation parameter and the percentage of hits is as large as possible.

ITCAM determines the typical nested request times from the nested request times in this zone, shown on the **Level2 Delays Distribution** chart.

3. Finally, ITCAM calculates the thresholds.

   The fair threshold is determined using the left and right borders of the selection zone and the Auto_Threshold_Fair_Projection parameter:

   F = L + ((R-L) * Auto_Threshold_Fair_Projection / 100)

   The bad threshold is calculated in the same way, using the Auto_Threshold_Bad_Projection parameter:

   B = L + ((R-L) * Auto_Threshold_Bad_Projection / 100)

   Example: the left border of the selection zone might be L=1450 ms, and the right border R=3000 ms. By default, Auto_Threshold_Fair_Projection=150, and Auto_Threshold_Bad_Projection=300. In this case:

   - The fair response threshold is F = 1450 + ((3000-1450) * 150 / 100) = 3775 ms
   - The bad response threshold is B = 1450 + ((3000-1450) * 300 / 100) = 6100 ms

WebSphere XD Overview for ITCAM Agent for WebSphere Applications

ITCAM for Application Diagnostics provides enhanced support for monitoring Virtual Enterprise and Compute Grid products, as well as the Intelligent Management and Batch features of WebSphere Application Server 8.5. The cells managed by these products or features are called WebSphere XD (Extended Deployment) cells. For each XD cell, configured for monitoring by the WebSphere agent, the Tivoli Enterprise Portal shows the subnode under the agent node in the navigation tree. The workspaces under the XD cell subnode show the XD monitoring information.

The XD monitoring data is collected through a JMX connection to the deployment manager server and does not require a data collector. However, if a data collector is installed on any WebSphere XD server, it is possible to drill down to more detailed information.

ITCAM provides the following Virtual Enterprise monitoring features:

Monitors the status and metrics of the ODR (On Demand Router) server:

- ODR server status – running, not running, number of running ODR servers in the cell.
- ODR server process JVM and OS metrics.
- Collects requests metrics from ODR servers in the cell and provides summarized statistics over cell, cluster, server, and application.

Monitors the status and metrics of dynamic clusters

- Dynamic clusters topology
- Cluster configuration and state

- Application servers in cluster
- Current number of servers running in cluster
- Max number of servers in cluster
- Dynamic WLM Weight
- ODR server process JVM and OS metrics

Monitors XD application servers JVM information
- Server process JVM and OS metrics

ITCAM provides the following Compute Grid monitoring features:

Monitors Job Scheduler servers
- Job Scheduler server status – running, not running, number of running Job Scheduler servers.
- Job performance metrics reported by job scheduler servers, summarized over cell and per job scheduler.
- Details on queued and executing jobs, including notifications and job steps.
- Job Scheduler server process JVM and OS metrics.

Monitors Grid Endpoint servers
- Grid Endpoint server status – running, not running.
- Job performance metrics reported by grid endpoint servers, summarized over cell, service policy, and application.
- Grid endpoint server process JVM and OS metrics.

There are a number of situations provided to detect problems in the XD environment and to open Tivoli Enterprise Portal events.

ITCAM for Application Diagnostics - WebSphere XD Cell workspaces

The Tivoli Enterprise Portal XD component has the following workspaces:

Table 68. WebSphere XD Cell Workspaces

Navigation tree and Workspaces	Secondary Workspaces (not in tree)	Description
WebSphere Agent		Displays the overall summary information about the XD Cell.
XD Cell		XD Cell Subnode that contains all the workspaces associated with WebSphere XD.
	Configuration	Used to configure XD connection settings
Virtual Enterprise		Displays ODR Summary Statistics.
Service policies		Displays ODR Statistics for each service policy.
	Service policy violations	Displays a list of service policy violation tasks.
	Service policy	Displays ODR Statistics for the selected policy.
Applications		Displays ODR statistics for each transaction class, application, and module.

Table 68. WebSphere XD Cell Workspaces (continued)

Navigation tree and Workspaces	Secondary Workspaces (not in tree)	Description
	Application	Displays ODR statistics for each transaction class, application, and module for the selected application.
Deployment Targets		Displays ODR statistics for deployment targets.
	Static Cluster	Displays ODR statistics for and individual static cluster.
Servers		Displays ODR and JVM operating system statistics.
	Server	Displays ODR and JVM operating system statistics for the selected server.
ODRs		Displays Statistics for ODRs.
	ODR	Displays Statistics for ODRs for the selected ODR server.
Dynamic Clusters		Displays dynamic clusters statistics.
	Dynamic Cluster	Displays dynamic clusters statistics for the selected cluster.
Compute Grid		Displays overall performance, loading, and health statistics on the compute grid.
Job Service Policies		Displays Job Statistics per service policy and summarizes all transactions classes that belong to the service policy.
	Job Service Policy	Displays Job Statistics per service policy and summarizes all transactions classes that belong to the service policy.
Job Applications		Displays Job statistics by transaction class for applications and modules.
	Job Application	Displays Job statistics by transaction class for applications and modules for the selected job application.
Grid Endpoints		Displays total statistics on grid endpoints.
	Grid Endpoint	Displays total statistics for the selected grid endpoint.
Job Scheduler Servers		Displays job scheduler statistics.
	Job Scheduler Server	Displays job scheduler statistics for the selected server.
Jobs		Displays running jobs.
	Job	Displays running jobs for the selected job.

WebSphere XD Cell subnode workspace

The XD Cell subnode displays overall request rates, job execution rates, and service policy violations.

This workspace displays data provided by the "XD Cell attributes" on page 328.

The predefined workspace contains the following items:

- **Situation Event Console** view displays all situation events for the XD Cell.
- The **Cell Summary** table displays connections settings and versions for the cell. You can click the link icon in any table row to click the Configuration link to access the XD Configuration workspace.

Accessing the XD Cell Subnode workspace

1. In the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. In the node list, expand the entry that corresponds to the node that you want to select.
3. In that node list of monitored applications, expand the list of WebSphere agents.
4. Expand the **WebSphere XD Cell**.
5. Click **XD Cell**.

Applications workspace

The applications workspace displays (On Demand Router) ODR Statistics for each unique application, module, transaction, class, and protocol combination summarized over all ODRs in the cell.

All statistics that display are the same as the Virtual Enterprise workspace. You can view more detailed information about the selected combination by clicking the link in the Applications table

This workspace displays data provided by the “ODRs attributes” on page 320.

The predefined workspace contains the following items:

- **Arrived Request Rate - History** chart displays the same information as the ODR request rate on the cell subnode. Rates display per second for each request.
  - Request Arrived Rate
- **Average Response Time - History** displays information about response timings in milliseconds:
  - Average Response Time gives ODR end to end request time
- The **Applications** table displays the latest status of each application

Accessing the Applications workspace

1. In the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. In the node list, expand the entry that corresponds to the node that you want to select.
3. In that node list of monitored applications, expand the WebSphere agent node.
4. Expand the **XD Cell**.
5. Click the **Applications** workspace.

Accessing the Application workspace for a specific application

- Click the link icon to view details for a specific application.
- In the Applications report, right-click the link icon and from the menu, click **Application** to display details about a specific application.
  - **Service Policy** Click this link to view specific server policies related to the server in the Service Policy workspace.

– **Per ODRS** Click this link to view the ODRS specific to the server in the ODRS workspace.
– **Per Deployment Target** Click this link to access Dynamic clusters specific to the server in the Deployment Target workspace.
– **Applications**
– **Link Wizard** Click to create links to workspaces.
– **Link Anchor** Click to display visual indicators on tables where customized links have been defined.

Note: Only applications that have some loading through the On Demand Router (ODR) display in the Applications workspace.

The application workspace displays Request Rate History and Average Request Time History as well as the following charts Request percent History and Request Time Deviation history.

Compute Grid workspace

The Compute Grid workspace displays Job Statistics for the cell. Information includes overall performance, loading, and health statistics of the compute grid for the cell.

This workspace displays data provided by the "Compute Grid Attributes" on page 316.

The predefined workspace contains the following items:

- Job Rate History chart: displays the overall job rates for the cell in minutes. The rates are Dispatched, Dispatch Error, Started and Completed.
- Average Job Time - History chart: displays the average job timings for the cell in seconds. The values are Queue, Dispatch, Dispatch Error, and Execute.
- Job Count - History displays the job count for the cell. The chart displays the status as either Queued or Running.
- Compute Grid table displays the current job statistics for the cell.

Accessing the Compute Grid workspace

To access this workspace, complete the following steps:

1. In the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. In the node list, expand the entry that corresponds to the node that you want to select.
3. In that node list of monitored applications, expand the WebSphere agent.
4. Expand the **XD Cell**.
5. Click the **Compute Grid** workspace.

The Compute Grid table displays details on job performance. In the table, right-click the link icon and from the menu, click **Service Policies** to view the Job Service Policies workspace.

Deployment Targets workspace

The deployment targets workspace displays ODR statistics per deployment target and per protocol.

This workspace displays data provided by the "ODRs attributes" on page 320.

The predefined workspace contains the following items:

- **Arrived Request Rate History** displays the arrived request rate history for each deployment target.
- **Average Response Time History** displays the average response time history for each deployment target.
- **Deployment Targets** displays the latest status of each deployment target.

Accessing the Deployment Targets workspace

To access this workspace, complete the following steps:

1. In the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. In the node list, expand the entry that corresponds to the node that you want to select.
3. In that node list of monitored applications, expand the WebSphere agent.
4. Expand the **XD Cell**.
5. Click the **Deployment Targets** workspace.

Accessing the specific information from the Deployment targets table

You can view more detailed information from the Deployment targets table.

- From the Deployments Target report, right-click the link icon and from the pop-up menu, click one of the following options to move to the relevant workspace.

  Important: Dynamic cluster and Static cluster and Server workspace links display only for the corresponding deployment target types.
  - **Server** Click this link to view the Server workspace.
  - **Dynamic Cluster** Click this link to view the Dynamic Cluster workspace. Dynamic Cluster can start, stop, and, create servers on demand.
  - **Static Cluster** Click this link to view the Static Cluster workspace. Static cluster servers are created and started by users.
  - **Per Service Policies:** Click this link to view the service policies specific to the selected deployment target.
  - **Per Applications** Click this link to view the applications specific to the selected deployment target.
  - **Per ODRs** Click this link to view the deployment target statistics for each ODR server that routes requests to the selected deployment target.

Dynamic Clusters workspace

The Dynamic Clusters workspace displays the topology of the dynamic clusters, servers, nodes, and node groups in your environment.

This workspace displays data provided by the “Dynamic Clusters attributes” on page 318 and the “Dynamic Cluster Topology attributes” on page 318.

The predefined workspace contains the following items:

- Dynamic Cluster Topology displays visual representation of the dynamic clusters and servers that belong to them with the corresponding nodes. You can point to each item for details.
- Dynamic Clusters table displays the latest information about the dynamic clusters in the cell.

Accessing the Dynamic Clusters workspace

To access this workspace, complete the following steps:

1. In the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. In the node list, expand the entry that corresponds to the node that you want to select.
3. In that node list of monitored applications, expand the WebSphere agent.
4. Expand the **XD Cell**.
5. Click the **Dynamic Clusters** workspace.

Accessing a specific Dynamic Cluster workspace

To access this workspace from the dynamic clusters workspace, use one of the following procedures:

- From the Dynamic Clusters table, click the link icon and select **Dynamic Cluster**.

When you click **Dynamic Clusters** the following information displays:

- **Topology** displays the selected dynamic cluster with its servers and corresponding nodes, and node groups. Point to the items to view additional information.
- **Request Rate History** chart displays the arrived request rate history in requests per second for the selected dynamic cluster.
- **Average Request Time History** chart displays the average request time history in milliseconds for the selected dynamic cluster.
- **Dynamic Cluster** table displays configuration and status data specific to the selected dynamic cluster.
- **ODR** statistics table displays ODR data specific to the selected dynamic cluster.

Grid Endpoints workspace

The Grid Endpoints workspace displays job statistics for each grid endpoint, that is for each WebSphere server that runs jobs.

This workspace displays data provided by the “Grid Endpoint attributes” on page 319.

The predefined workspace contains the following items:

- Job Started Rate - History chart displays the Job Started rate per minute.
- Average Completion Time- History chart displays the Average Job Completion Time in minutes.
- The Grid Endpoints table that displays statistics for the server.

Accessing the Grid Endpoints workspace

To access this workspace, complete the following steps:

1. In the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. In the node list, expand the entry that corresponds to the node that you want to select.
3. In that node list of monitored applications, expand the WebSphere agent.
4. Expand the **XD Cell**.

5. Click the **Grid Endpoints** workspace.

Accessing a specific Grid Endpoint workspace

- From the Grid Endpoints table, right-click the link icon and from the menu, click **Grid Endpoint**.

When you click **Grid Endpoint** the following information displays:

- **Average Completion Time - History** chart displays the average job completion time in minutes.
- **Job Rate - History** chart displays the job rate per minute. The status is Started or Completed.
- **JVM Heap Size** chart displays the amount of heap size in MB, the status is Used or Free.
- **CPU Used - History** displays the percentage of the host CPU used by the JVM.
- The Grid Endpoint table displays the job statistics for the selected policy.
- It is also possible that other workspace links that are available depending on the configuration. Click the relevant link to view the workspace of your choice:
- **Server Diagnostic** Click to view the WebSphere application server.
- **Per Job Service Policies** Click to view the Job Service Policies workspace
- **Per Applications** Click to view the Job Applications workspace.
- **Grid Endpoint** Click to view details of a specific grid endpoint.
- **Link Wizard** Click to create links to workspaces.
- **Link Anchor** Click to display visual indicators on tables where customized links have been defined.

Job Applications workspace

The Job Applications workspace displays job statistics for each application, module, and transaction class combination.

The predefined workspace contains the following items:

- Job Started Rate - History chart displays the Job Started rate per minute.
- Average Completion Time- History chart displays the Average Job Completion Time in minutes.
- The Job Applications table displays job statistics for each job application.

Accessing the Job Applications workspace

To access this workspace, complete the following steps:

1. In the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. In the node list, expand the entry that corresponds to the node that you want to select.
3. In that node list of monitored applications, expand the WebSphere agent.
4. Expand the **XD Cell**.
5. Click the **Job Applications** workspace.

Accessing a specific Job Application workspace

- From the Job Applications table, right-click the link icon and from the menu, click **Job Application**.

When you click **Job Application** the following information displays:

- Jobs Running - History chart displays the jobs running per minute.
- Average Completion Time - History chart displays the average job completion time in minutes.
- Job Started Rate - History chart displays the job rate per minute. The status is Started or Completed.
- The Job Application table displays the job statistics for the selected policy.

Job Scheduler Servers workspace

The Job Scheduler Servers workspace displays job statistics for each WebSphere application server server where Job Scheduler is running.

This workspace displays data provided by the "Compute Grid Attributes" on page 316 attributes.

The predefined workspace contains the following items:

- Job Dispatched Rate - History chart displays the Job Dispatched rate per minute.
- Average Queue Time- History chart displays the Average Job Queue Time in minutes.
- The Job Scheduler Servers table displays job statistics for each Job Scheduler.

Accessing the Job Scheduler Servers workspace

To access this workspace, complete the following steps:

1. In the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. In the node list, expand the entry that corresponds to the node that you want to select.
3. In that node list of monitored applications, expand the WebSphere agent.
4. Expand the **XD Cell**.
5. Click the **Job Scheduler Servers** workspace.

Accessing a specific Job Scheduler Servers workspace

- From the Job Scheduler Servers table, right-click the link icon and from the menu, click **Job Scheduler Server**.

When you click **Job Scheduler Server** the following information displays:

- Job Rate - History chart displays the job rate per minute. The statuses are Dispatched, Dispatched Error, or Completed.
- Job Average Time - History chart displays the average job completion time in seconds. The status is Queue, Dispatched, or Dispatched Error.
- JVM Heap Size chart displays the amount of heap size in MB, the status is Used or Free.
- CPU Used - History displays the percentage of the host CPU used by the JVM.
- The Job Scheduler Server table displays the job statistics for the selected policy.
- **Link Wizard** Click to manually add links to other workspaces.
- **Link Anchor** Click to display visual indicators on tables where customized links have been defined

Job Service Policies workspace

The Job Service Policies workspace displays jobs statistics for each service policy.

This workspace displays data provided by the "Service Policy Violations attributes" on page 326 attributes.

The predefined workspace contains the following items:

- Job Started Rate - History chart displays the Job Started rate per minute.
- Average Completion Time- History chart displays the Average Job Completion Time in minutes.
- The Job Service Policies table displays job statistics for each job service policy.

Accessing the Job Service Policies workspace

To access this workspace, complete the following steps:

1. In the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. In the node list, expand the entry that corresponds to the node that you want to select.
3. In that node list of monitored applications, expand the WebSphere agent.
4. Expand the **XD Cell**.
5. Click the **Job Service Policies** workspace.

Accessing a specific Job Service policy workspace

- From the Job Service Policies table, right-click the link icon and from the menu, click **Job Service Policy**.

When you click **Job Service Policy** the following information displays:

- Jobs Running - History chart displays the jobs running per minute.
- Average Completion Time - History chart displays the average job completion time in minutes.
- Job Rate - History chart displays the job rate per minute. The status is Started or Completed.
- The Service Policy table displays the job statistics for the selected policy.
- It is also possible that other workspace links that are available depending on the configuration. Click the relevant link to view the workspace of your choice:
- **Job Applications** Click this link to view the Job Applications workspace
- **Job Service Policy** Click to view details of a specific job service policy.
- **Link Wizard** Click to manually add links to other workspaces.
- **Link Anchor** Click to display visual indicators on tables where customized links have been defined

The Service Policy table displays information about jobs and the service policy goal.

Jobs workspace

The Jobs workspace displays scheduled and running jobs.

This workspace displays data provided by the "Jobs attributes" on page 323 and "WebSphere XD Job Filter attributes" on page 323.

The predefined workspace contains the following items:

- Job Filter - right-click the link to access the Set Job Filter where you can modify the filter display fields.

- Job Topology - displays the submitted jobs that have passed through the filter. You can point to each item to view the details.
- The Jobs Instances table displays the status of each job.

Accessing the Jobs workspace

To access this workspace, complete the following steps:

1. In the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. In the node list, expand the entry that corresponds to the node that you want to select.
3. In that node list of monitored applications, expand the WebSphere agent.
4. Expand the **XD Cell**.
5. Click the **Jobs** workspace.

Setting the Job Filter

- From the Job Filter table, right-click the link icon and from the menu, click **Set Job Filter**.

You can add information to the following fields to change how the job filter table displays:

- **Grid Endpoint**
- **Job Scheduler**
- **Total Time Greater**
- **Queue Time Greater**
- **Job Name**
- **Maximum Jobs**
- **Sort Order** The options are Ascending or Descending
- **Sort By** The options are Total Time and Queue Time
- **Job ID**

When you click OK to implement the changes, the changes display in the Job Filter view. Once you move to another workspace the Job Filter settings revert to the default settings. If you want the Job Filter to retain the changes, edit the Agent Configuration workspace, Job Filter Settings tab.

Accessing the Job Instances workspace

- From the Job Instances table, right-click the link icon and from the menu, click **Job Instance**.

When you click **Job Instance** the following information displays and relates directly to the job you selected.

- Topology displays details relating to the selected job. You can point to each item to view the details.
- Job Notifications chart displays the notifications received for the selected job.
- Job Steps chart displays executed and executing job steps.
- The Job table displays the job statistics for the selected job.

ODRs workspace

The ODRs workspace displays request statistics for each ODR server (per protocol).

This workspace displays data provided by the "ODRs attributes" on page 320.

The predefined workspace contains the following items:

- **Arrived Request Rate - History** Chart displays the arrived request rate history in requests per second for each ODR server (per protocol).
- **Average Response Time - History** Chart displays the average response time history in milliseconds for each ODR server (per protocol).
- The **ODRs** table shows the status and statistics for each ODR server (per protocol for the last interval).

Accessing the ODRs workspace

1. In the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. In the node list, expand the entry that corresponds to the node that you want to select.
3. In that node list of monitored applications, expand the WebSphere agent.
4. Expand the **XD Cell**.
5. Click the **ODRs** workspace

Viewing an individual ODR workspace

Use the following instructions to view specific details on an individual ODR server.

- From the ODRs table report, click the link icon and select **ODR**.

The following links are available for detailed request statistics as routed by the selected ODR:

- **Per Service Policies** Click to view the service policy request statistics.
- When you click **ODR** (the default link) the following charts display:
  - Request Rate History
  - Average Request Time History
  - JVM Heap Size History Displays the heap size used and free.
  - CPU Used History displays the percentage of the host CPU used by JVM.

Servers workspace

The servers workspace displays ODR statistics for each server and protocol.

This workspace displays data provided by the "Servers attributes" on page 325.

The predefined workspace contains the following items:

- **Arrived Request Rate - History** Chart displays the arrived request rate history in requests per second for each server (per protocol).
- **Average Response Time - History** Chart displays the average response time history in milliseconds for each ODR server (per protocol).
- The **Servers** table shows current server status and statistics for each server.

Accessing the Servers workspace

To access this workspace, complete the following steps:

1. In the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. In the node list, expand the entry that corresponds to the node that you want to select.
3. In that node list of monitored applications, expand the WebSphere agent.
4. Expand the **XD Cell**.
5. Click the **Servers** workspace

Viewing server details

- From the Servers report, click the link icon.
- If the server you select is monitored by a data collector, you can also see a **Server Diagnostics** link. Click this link to access the application server data collector workspaces.
- Click **Server** to view details relating to a specific server.

When you click **Server** the following charts display:

- Request Rate History
- Average Request Time History
- JVM Heap Size History: displays the heap size used and free.
- CPU Used History: displays the percentage of CPU used by JVM.

A Server table is also displayed. The table contains a single row that shows performance information for the server.

Service Policies workspace

The Service policies workspace displays (On Demand Router) ODR statistics for service policies and protocol, summarized over all the ODRs in the XD Cell.

The statistics that display are the same as the statistics in the virtual enterprise workspace. You can view more detailed information about the selected service policy by clicking the link in the policies table.

Accessing the Service policies workspace

1. In the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. In the node list, expand the entry that corresponds to the node that you want to select.
3. In that node list of monitored applications, expand the WebSphere agent.
4. Expand the **XD Cell**.
5. Click the **Service Policies** workspace

This workspace displays data provided by the “Service Policy Violations attributes” on page 326.

The predefined workspace contains the following items:

- **Arrived Request Rate - History** Chart displays the arrived request rate history in requests per second for each server (per protocol).
- **Average Response Time - History** Chart displays the average response time history in milliseconds for each ODR server (per protocol).

- The **Service Policies** table shows a current sample of the workplace statistics. Click the link in a table row to view details of individual service policies.

Accessing the Service policy violations workspace

The Service Policy violations workspace displays a list of service policy violation tasks.

1. To access this workspace, from the **XD Cell**, select the **Service Policies** node.
2. Right-click**Service Policies > Workspaces > Service Policy Violations**.
3. The **Open Service Policy Violation Tasks** report displays a list of all open tasks.
4. You can sort the report according to the columns displayed. Click the column that you want to sort by to display the filter arrow in the column, then click the arrow up or down to sort.
5. Click the link arrow for a row to view a specific service policy violation.

Accessing the Service policies workspace

1. In the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. In the node list, expand the entry that corresponds to the node that you want to select.
3. In that node list of monitored applications, expand the WebSphere agent.
4. Expand the **XD Cell**.
5. Click the **Service Policies** workspace.

This workspace displays data provided by the "Service Policy Violations attributes" on page 326.

The predefined workspace contains the following items:

- **Arrived Request Rate - History** Chart displays the arrived request rate history in requests per second for each server (per protocol).
- **Average Response Time - History** Chart displays the average response time history in milliseconds for each ODR server (per protocol).
- The **Service Policies** table shows a current sample of the workplace statistics. Click the link in a table row to view details of individual service policies.
- From the Service policies report, click the link icon for a row.
- Right-click the link icon to view the following menu options:
  - **Service Policy** (default) displays details of the selected policy
  - **Per ODRs** Click this link to view the service policy request statistics per ODR server.
  - **Per Deployment Target** Click this link to view the service policy request statistics per deployment target.
  - **Applications** Click this link to access the applications specific to the service policy in the Applications workspace.

This Service policy workspace displays the charts for the following information:

- **Request Rate History** Chart displays request rates in requests per second.
  - **Request Arrived Rate** displays the rate per second of requests arrived at ODR during the sampling interval.

  - **Request Dispatched Rate** displays the rate per second of the requests dispatched from ODR to server during the sampling interval.
  - **Request Serviced Rate** displays the rate per second of requests returned from server to ODR during the sampling interval.
- **Average Request Time - History** displays information about request timings in milliseconds.
  - **Average Wait Time** the average wait time of the request in the queue.
  - **Average Response Time** the average response time of the request.
  - **Average Service Time** the average service time of the request.
  - **Average Service Time out** The average service time of the requests completed due to timeout during the sampling interval.
  - **Average Response Time out** The average response time of the requests completed due to timeout during the sampling interval.
  - **Average Dequeue Time** The average dequeue time of the requests dequeued during the sampling interval.
- **Request Percent History** Chart displays miscellaneous request percents.
  - **Failed**
  - **Dropped**
  - **Above Goal**
  - **Timed Out**
- **Average ODR Queue Length** Chart displays average number of requests in ODR queue for the selected service policy.

Virtual Enterprise workspace

The virtual enterprise workspace displays ODR statistics by protocol summarized over all the ODRs in the cell.

If you are using simple setup only the HTTP/S protocol is present.

This workspace displays data provided by the "ODRs attributes" on page 320.

The predefined workspace contains the following items:

- **Request Rate History** displays the same information as the ODR request rate on the cell subnode. Rates are displayed per second for each request.
  - **Request Failed Rate** displays the rate per second of requests returned with an error indicator during the sampling interval.
  - **Request Arrived Rate** displays the rate per second of requests arrived at ODR during the sampling interval.
  - **Request Dropped Rate** Displays the rate per second of requests dropped by ODR after arrival or later from the queue during the sampling interval.
  - **Request Dispatched Rate** displays the rate per second of the requests dispatched from ODR to server during the sampling interval.
  - **Request Serviced Rate** displays the rate per second of requests returned from server to ODR during the sampling interval.
  - **Request Above Goal Rate** displays the rate per second of requests above response time threshold during the sampling interval.
- **Average Request Time - History** displays information about request timings in milliseconds.
  - **Average Wait Time** displays the average wait time of the request in the queue.

- **Average Response Time** displays the average response time of the request.
- **Average Service Time** displays the average service time of the request.
- **Average Service Time out** Displays the average service time of the requests completed due to timeout during the sampling interval.
- **Average Response Time out** Displays the average response time of the requests completed due to timeout during the sampling interval.
- **Average Dequeue Time** Displays the average dequeue time of the requests dequeued during the sampling interval.
- **Average Queue Length** Displays this as zero in a simple setup.
- **Average Request Time Deviation History** Displays is the average response time in milliseconds.
- **Response Time Deviation** displays the response time deviation.
- **Service Time Deviation** displays the average service time deviation during the sampling interval.

- The **Virtual Enterprise** table shows a current sample of the workplace statistics.
- You can also access the Service Policies workspace from this table.

Accessing the Virtual Enterprise workspace

1. In the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. In the node list, expand the entry that corresponds to the node that you want to select.
3. In that node list of monitored applications, expand the WebSphere agent.
4. Expand the **XD Cell**.
5. Click the **Virtual Enterprises** workspace.

Accessing the service policy workspace

From the Virtual Enterprise report, click the link icon and then click **Service Policy** to access the Service Policy workspace.

WebSphere XD Attributes

IBM Tivoli Composite Application Manager Agent for WebSphere Applications uses several attribute groups to store data for WebSphere XD monitoring.

Compute Grid Attributes

The **Compute Grid** attributes provide information and statistics about the WebSphere XD Compute Grid.

The attributes within this group are used to build the “Compute Grid workspace” on page 305 and the “Job Scheduler Servers workspace” on page 309.

Average Job Dispatch Time (min) Indicates the average time spent to dispatch jobs during the sampling interval.

Average Dispatch Error Time (min) Indicates the average time spent for the failed job dispatches during the sampling interval.

Average Job Execution Time (min) Indicates the average job execution time during the sampling interval.

Average Job Queue Time (min) Indicates the average time jobs spent in queue during the sampling interval.

Cell Name Indicates the WebSphere XD Cell name.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Job Completed Count Indicates the number of jobs completed during the sampling interval.

Job Completed Rate (per min) Indicates the rate per minute of the jobs completed during the sampling interval.

Job Dispatch Error Count Indicates the number of job dispatch errors during the sampling interval.

Job Dispatch Error Rate (per min) Indicates the rate per minute of the job dispatch errors during the sampling interval.

Job Dispatched Count Indicates the number of jobs dispatched during the sampling interval.

Jobs Dispatched Rate (per min) Indicates the rate per minute of the jobs dispatched during the sampling interval.

Jobs In Queue Indicates the current number of jobs in Job Scheduler queue.

Jobs Running Indicates the current number of running jobs.

Job Scheduler Server Name Indicates the WebSphere server name of the Job Scheduler.

Job Scheduler Server Node Indicates the WebSphere node name of the Job Scheduler.

Job Scheduler Servers Running Indicates the current number of running Job Scheduler servers.

Job Scheduler Deployment Target Name The deployment target name of the Job Scheduler.

Job Scheduler Deployment Target Type The deployment target type of the Job Scheduler.

Job Started Count Indicates the number of jobs started during the sample interval.

Job Started Rate (per min) Indicates the rate per minute of the jobs started during the sampling interval.

Label Indicates the row label.

Origin Node Indicates the XD Cell subnode.

Row Type Indicates the row type.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; *Example:* 09/25/09 16:20:46 indicates the data was collected on September 25 2009, at 14:20:46.

Server State Indicates the WebSphere server state of the Job Scheduler. The state can be Running, Stopped, Starting, Stopping, or Maintenance.

Dynamic Clusters attributes

The **Dynamic Clusters** attributes provide information about WebSphere XD dynamic clusters.

The attributes within this group are used to build the "Dynamic Clusters workspace" on page 306

Cell Name Indicates the WebSphere XD Cell name.

Cluster Member Type Indicates the cluster member type.

Cluster Name Indicates the cluster name.

Cluster State Indicates the cluster state.

Configured Servers Indicates the configured number of servers in the dynamic cluster.

Interval (sec) Indicates the length of the sample interval in seconds.

Maximum Servers Indicates the maximum number of servers in the dynamic cluster.

Minimum Servers Indicates the minimum number of servers in the dynamic cluster.

Origin Node Indicates the XD Cell subnode.

Running Servers Indicates the current number of running servers in the dynamic cluster.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; *Example:* 09/25/09 16:20:46 indicates the data was collected on September 25 2009, at 14:20:46.

Dynamic Cluster Topology attributes

The WebSphere XD **Dynamic Cluster Topology** attributes provide topology information about the dynamic clusters.

The attributes within this group are used to build the "Dynamic Clusters workspace" on page 306.

Cell Name Indicates the WebSphere XD Cell name.

Filter Indicates the filter which is applied to the topology view.

From Node ID Indicates the incoming link topology node ID.

ID Indicates the topology node ID.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Name Indicates the topology node name.

Origin Node Indicates the XD Cell subnode.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; *Example:* 09/25/09 16:20:46 indicates the data was collected on September 25 2009, at 14:20:46.

State Indicates the topology node state.

To Node ID Indicates the outgoing link topology node ID.

Type Indicates the topology node type.

Grid Endpoint attributes

The WebSphere XD **Grid Endpoint** attributes provide information about compute grid endpoint servers.

The attributes within this group are used to build the "Grid Endpoints workspace" on page 307, "Job Applications workspace" on page 308 and,"Job Service Policies workspace" on page 309

Application Indicates the job application name.

Application Label Indicates the application label.

Average Job Completion Time (min) Indicates the average job execution time during the sampling interval.

Cell Name Indicates the WebSphere XD Cell name.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Job Completed Count Indicates the number of jobs completed during the sampling interval.

Job Completed Rate (per min) Indicates the rate per minute of the jobs completed during the sampling interval.

Jobs Running Indicates the average job execution time during the sampling interval.

Job Started Count Indicates the number of jobs started during the sampling interval.

Job Started Rate (per min) Indicates the rate per minute of the jobs started during the sampling interval.

Label Indicates the row label.

Module Indicates the job module name.

Node Name The name of the Grid Endpoint server node.

Origin Node Indicates the XD Cell subnode.

Row Type Indicates the row type.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; *Example:* 09/25/09 16:20:46 indicates the data was collected on September 25 2009, at 14:20:46.

Server Name The name of the Grid Endpoint server.

Service Policy Indicates the job service policy name.

Service Policy Goal Value (min) Indicates the service policy goal value.

Service Policy Goal Type Indicates the service policy goal type.

Service Policy Importance Indicates the service policy importance.

Transaction Class Indicates the job transaction class name.

ODRs attributes

The **ODRs** (On Demand Routers) attributes provide information about the WebSphere XD On Demand Routers.

The attributes within this group are used to build the "ODRs workspace" on page 312.

Average Dequeue Time (msec) The average dequeue time of the requests dequeued during the sampling interval.

Average Queue Length The average ODR queue length.

Average Response Time (msec) The average response time of the request.

Average Response Timeout (msec) The average response time of the requests completed due to timeout during the sampling interval.

Average Service Time (msec) The average service time of the request.

Average Service Timeout (msec) The average service time of the requests completed due to timeout during the sampling interval.

Average Wait Time (msec) The average wait time of the request in the queue.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

ODR Server Name The ODR server name.

ODR Server Node The ODR node name.

ODR Servers Running How many ODR servers are running The valid format is a 4-byte integer.

Protocol The protocol name.

ODR Server Status The ODR server status. Status can be Stopped, Running or Maintenance.

Request Above Goal Count The number of requests above response time threshold during the sampling interval.

Request Above Goal Percent Indicates the percent of serviced requests which were above response time threshold during the sampling interval.

Request Above Goal Rate (per sec) The rate per second of requests above response time threshold during the sampling interval.

Request Arrived Count The number of requests arrived at ODR during the sampling interval.

Request Arrived Rate (per sec) The rate per second of requests that arrived at ODR during the sampling interval.

Request Failed Count The number of requests returned with an error indicator during the sampling interval.

Request Failed Percent Indicates the percent of requests that returned, during the reported interval, with an error indicator.

Request Failed Rate (per sec) The rate per second of requests returned with an error indicator during the sampling interval.

Request Dispatched Count The number of requests dispatched from ODR to server during the sampling interval.

Request Dispatched Rate (per sec) The rate per second of the requests dispatched from ODR to server during the sampling interval.

Request Dropped Count The number of requests dropped by ODR after arrival or later from the queue during the sampling interval.

Request Dropped Rate (per sec) The rate per second of requests dropped by ODR after arrival or later from the queue during the sampling interval.

Request Dropped Percent Indicates the percent of requests dropped at OnDemand Router.

Response Time Deviation (msec) The response time deviation.

Request Timed Out Percent Indicates the percent of requests that returned, during the reported interval, due to service timeout.

Request Serviced Count The number of requests returned from server to ODR during the sampling interval.

Request Serviced Rate (per sec) The rate per second of requests returned from server to ODR during the sampling interval.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; *Example:* 09/25/09 16:20:46 indicates the data was collected on September 25 2009, at 14:20:46.

Service Time Deviation (msec) The average service time deviation during the sampling interval.

Origin Node The XD Cell subnode.

Cell Name The WebSphere XD Cell name.

Deployment Target Name The Deployment Target name.

Deployment Target Type Indicates the deployment target type. Deployment target types can be Dynamic Cluster, Static Cluster, or Server.

Row Type Indicates the row type.

Server Name Indicates the server name.

Server Node Indicates the server node name.

Server Status Indicates the server status. The Server status can be Stopped, Running or Maintenance.

Server Weight Indicates the server weight in cluster.

Application Indicates the application name.

Module Indicates the name of the module.

Transaction Class Indicates the transaction class.

Service Policy Indicates the service policy name.

Service Policy Importance Indicates the service policy importance.

Service Policy Goal Type Indicates the service policy goal type.

Service Policy Goal Value (msec) Indicates the service policy goal value.

Request Timed Out Count Indicates the number of requests that completed due to service timeout during the sampling interval.

Requests Timed Out Rate (per sec) Indicates the rate per second of requests that completed due to service timeout during the sampling interval.

Label Indicates the row label.

Application Label Indicates the application label.

Jobs attributes

The WebSphere XD **Jobs** might be in queue, in a submitted state or in a suspended state. The Jobs workspace provided information about jobs that are active and not finished.

The attributes within this group are used to build the "Jobs workspace" on page 310.

Cell Name Indicates the WebSphere XD Cell name.

Execute Time (min) The job execution time.

Grid Endpoint Server Name The Grid Endpoint server name where job is running.

Grid Endpoint Server Node The Grid Endpoint node name.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Job ID The job ID.

Job Type The job type.

Job Scheduler Server Name The Job Scheduler server name on which job is scheduled.

Job Scheduler Server Node The Job Scheduler node name.

Origin Node Indicates the XD Cell subnode.

Queue Time (min) The current number of minutes job spent in queue.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; *Example:* 09/25/09 16:20:46 indicates the data was collected on September 25 2009, at 14:20:46.

Start Date and Time The job start date and time.

State Indicates the job state.

Submitter The job submitter name.

Suspended Until The job is suspended until the specified date and time.

Total Time (min) The total time passed since the job was submitted.

Filter The name of the job filter. The valid format is an alphanumeric string, with a maximum of 256 characters.

WebSphere XD Job Filter attributes

The WebSphere XD **Job Filter** attributes provide information about the current job filter.

The attributes within this group are used to build the jobs filter table in the "Jobs workspace" on page 310workspace.

Cell Name Indicates the WebSphere XD Cell name.

Total Time Greater (min) Indicates the filter for job total time to be greater than the specified time.

Grid Endpoint Indicates the filter for the Grid Endpoint full server name (node:server).

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Job ID Indicates the filter for the job ID.

Job Name Indicates the filter for the job name.

Job Scheduler Server Indicates the filter for the Job Scheduler full server name (node:server).

Maximum Jobs Indicates the maximum number of jobs to pass the filter.

Queue Time Greater (min) Indicates the filter for job time in queue to be greater than the specified time.

Sort Order Indicates the job sort order.

Sort By Indicates the jobs attribute to sort by.

Origin Node Indicates the XD Cell subnode.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; *Example:* 09/25/09 16:20:46 indicates the data was collected on September 25 2009, at 14:20:46.

Filter ID The ID of the filter. The valid format is a 4-byte integer.

Filter The name of the filter. The valid format is an alphanumeric string, with a maximum of 256 characters.

Job Notification attributes

The WebSphere XD **Job Notification** attributes provide information about the current job notifications.

The attributes within this group are used to build the “Jobs workspace” on page 310.

Cell Name Indicates the WebSphere XD Cell name.

Date and Time Indicates the notification date and time.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Job ID Indicates the job ID.

Origin Node Indicates the XD Cell subnode.

Notification Type Indicates the notification type.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; *Example:* 09/25/09 16:20:46 indicates the data was collected on September 25 2009, at 14:20:46.

Sequence Number Indicates the notification sequence number.

Step Name Indicates the step name.

Job Topology attributes

The WebSphere XD **Job Topology** attributes provide topology information about running jobs.

The attributes within this group are used to build the "Jobs workspace" on page 310.

Cell Name Indicates the WebSphere XD Cell name.

From Node ID Indicates the incoming link node ID.

ID Indicates the node ID.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Job ID Indicates the job ID.

Name Indicates the node name.

Origin Node Indicates the XD Cell subnode.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; *Example:* 09/25/09 16:20:46 indicates the data was collected on September 25 2009, at 14:20:46.

State Indicates the node state.

To Node ID Indicates the outgoing link node ID.

Type Indicates the node type.

Filter The name of the job filter. The valid format is an alphanumeric string, with a maximum of 128 characters.

Servers attributes

The **Servers** attributes provide JVM and process information about the WebSphere XD servers.

The attributes within this group are used to build the "Servers workspace" on page 312.

Origin Node Indicates the XD Cell subnode.

Cell Name Indicates the WebSphere XD Cell name.

CPU Used Percent Indicates the server CPU usage percent.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

JVM Heap Used (MB) Indicates the size of the used JVM heap space.

JVM Heap Free (MB) Indicates the size of the free JVM heap space.

JVM Heap Total (MB) Indicates the total JVM heap size.

Process Resident Memory (MB) Indicates the server process resident memory.

Process Total Memory (MB) Indicates the server process total memory.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; *Example:* 09/25/09 16:20:46 indicates the data was collected on September 25 2009, at 14:20:46.

Server Name The name of the server.

Sever Node The name of the server node.

Service Policy Violations attributes

The WebSphere XD **Service Policy Violations** attributes provide information about open service policy violation tasks.

The attributes within this group are used to build the"Service Policies workspace" on page 313.

Cell Name Indicates the WebSphere XD Cell name.

Date and Time Indicates the date and time when the service policy violation task was open.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Origin Node Indicates the XD Cell subnode.

Row Number Indicates sequential row number.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; *Example:* 09/25/09 16:20:46 indicates the data was collected on September 25 2009, at 14:20:46.

Service Policy Indicates the service policy name.

Service Policy Importance Indicates the service policy importance.

Service Policy Goal Type Indicates the service policy goal type.

Service Policy Goal Unit Indicates the service policy goal unit.

Service Policy Goal Value Indicates the service policy goal value.

Violation Indicates the service policy violation task description.

Steps attributes

The WebSphere XD **Steps** attributes provide information about current steps.

The attributes within this group are used to build the "Jobs workspace" on page 310.

Cell Name Indicates the WebSphere XD Cell name.

End Date and Time Indicates the step end date.

Execution Time (min) Indicates the step execution time in minutes.

Job ID Indicates the job ID.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Origin Node Indicates the XD Cell subnode.

Result Code Indicates the finished step result code.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; *Example:* 09/25/09 16:20:46 indicates the data was collected on September 25 2009, at 14:20:46.

Start Date and Time Indicates the step start date.

Status Indicates the finished step status.

Step Name Indicates the step name.

XD Cell subnode attributes

The **XD Cell** Configuration attributes provide configuration information.

The attributes within this group are used to build the "WebSphere XD Cell subnode workspace" on page 303.

Origin Node Indicates the XD Cell subnode.

Cell Name Indicates the WebSphere XD Cell name.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; *Example:* 09/25/09 16:20:46 indicates the data was collected on September 25 2009, at 14:20:46.

Row Id The row identifier. The valid format is a 2-byte integer.

View Id The view identifier. The valid format is a 2-byte integer.

Act Id The act identifier. The valid format is a 2-byte integer.

Data The data string. The valid format is an alphanumeric string, with a maximum of 4096 characters.

XD Cell attributes

The WebSphere **XD Cell** attributes provide information about a WebSphere XD cell.

The attributes within this group are used to build the "WebSphere XD Cell subnode workspace" on page 303.

Connection Status Indicates the connection status to the cell deployment manager.

Connection Host Indicates the connection address of the deployment manager.

Connection Port Indicates the connection port of the deployment manager.

Connection Type Indicates the connection type of the deployment manager.

WebSphere Version Indicates the WebSphere version.

WebSphere Location Indicates the WebSphere XD root directory.

Cell Name Indicates the WebSphere XD Cell name.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Origin Node Indicates the XD Cell subnode.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; *Example:* 09/25/09 16:20:46 indicates the data was collected on September 25 2009, at 14:20:46.

ITCAM for Application Diagnostics - WebSphere XD Take Actions

Use the XD Take Action commands in the Tivoli Enterprise Portal interface to add and remove XD cells to and from a WebSphere application server.

WebSphere XD uses two take action commands.

- Add_XD_Cell
- Remove_XD_Cell

You must use the Add_XD_Cell command as part of the XD Cell configuration process.

To remove an XD Cell, you must access this option from the node of the XD cell that you want to remove. For more information, see"Remove_XD_Cell: Remove an XD cell from the WebSphere XD Cell" on page 329

Remove_XD_Cell: Remove an XD cell from the WebSphere XD Cell

Use the Remove_XD_Cell command to remove an XD cell from the WebSphere XD Cell. This take action command is available on the specific cell subnode only.

Command syntax

Before you remove an XD cell from the agent, disable monitoring using the configuration workspace. If you do not disable monitoring, then the Remove_XD_Cell finishes displaying an error message notifying you to disable monitoring beforehand. See "Application Diagnostics Configuration - Basic Tab" on page 58

1. To access the command, right-click the XD Cell node that you want to remove. Click **Take Actions > Select**.
2. From the **Name** drop-down menu, select **Remove_XD_Cell**.
3. Click **OK** to remove the cell.

YN:RemXDCell

See also "ITCAM for Application Diagnostics - WebSphere XD Take Actions" on page 328

ITCAM for Application Diagnostics - XD Agent situations

WebSphere XD has a number of predefined situations that you can use to complete the following tasks:

- Detect importance conditions in the WebSphere XD cell you monitor.
- Create your own situations using the predefined situations as examples.

These predefined situations display an alert status. When these situations trigger an alert, you can investigate the event by opening its workspace. For example, you can use these situations to monitor a WebSphere XD cell for requests not meeting the expected goal.

How the situations work

Situations are tests expressed in IF-TRUE format of system conditions that you want to monitor; the tested value is an ITCAM Agent for WebSphere Applications attribute expressed in the form *attribute-group.attribute-name*. If the specified condition occurs or exists, the situation is true, and an alert is issued.

Avoid using negative values

If you define situations that use a counter or a range of numbers, always provide a threshold or use values in a positive range of numbers. For example, use a greater-than-or-equal-to-zero expression as shown in some of the following predefined situations. This practice prevents a situation from falsely tripping. If the ITCAM Agent for WebSphere Applications Tivoli Enterprise Monitoring Agent encounters an undefined attribute value, it reports this value as a negative number and a situation that specifies a negative number can fire erroneously.

Accessing the situations

A number of predefined situations are shipped to monitor the WebSphere XD Cell. All of the situations except **XDVEAppReqArrivedRateHigh** are active by default.

You can customize thresholds used in a situation to suit your environment. Situation **XDVEAppReqArrivedRateHigh**, needs to be run manually. To start a situation manually, access the situations in the Tivoli Enterprise Portal using one of the following methods:

- From the toolbar on the main menu, click the Situation Editor icon  and scroll to the situation that you want to view.
- In the WebSphere agent, right-click the specific workspace. Click **Manage Situations** to display all the managed situations available. If you want to start, stop, edit or model a situation, right-click the situation and select the option you want.

XDConnectionError monitors connectivity between the monitoring agent and the deployment manager and issues a Critical alert when there is no connection between the monitoring agent and the deployment manager. The formula is:

If

WebSphere_XD_Cell.Connection_Status equals error

then

the situation XDConnectionError is true.

XDCPUUsedHigh monitors the percentage of the CPU being consumed and issues a Critical alert when the CPU usage is higher than 80%. The formula is:

If

WebSphere_XD_Servers.CPU_Used_Percent is greater than 80

then

the situation XDCPUUsedHigh is true.

XDVEODRNotRunning monitors the ODR servers running in the XD cell and issues a Critical alert when the number of ODR servers running equals 0. The formula is:

If

WebSphere_XD_ODR.Servers_Running equals 0 and
WebSphere_XD_ODR.Row_Type equals ODR

then

the situation XDVEODRNotRunning is true.

XDVEODRQueueLengthHigh monitors the average ODR server queue length and issues a Critical alert when the queue length is longer than 10. The formula is:

If

WebSphere_XD_ODR.Average_Queue_Length is greater than 10 and
WebSphere_XD_ODR.Row_Type equals ODR

then

the situation XDVEODRQueueLengthHigh is true.

XDVEAppReqFailedPercentHigh monitors the percentage of failed application requests and issues a Critical alert when more than 0.5 percent of application request fail. The formula is:

If

WebSphere_XD_ODR.Request_Failed_Percent is greater than 0.5 and WebSphere_XD_ODR.Row_Type equals Application

then

the situation XDVEAppReqFailedPercentHigh is true.

XDVEAppReqDroppedPercentHigh monitors the percentage of application requests that drop and issues a Critical alert when percent of dropped request is higher than 0.5 percent. The formula is:

If

WebSphere_XD_ODR.Request_Dropped_Percent is greater than 0.5 and WebSphere_XD_ODR.Row_Type equals Application

then

the situation XDVEAppReqDroppedPercentHigh is true.

XDVEAppReqArrivedRateHigh monitors the application request arrival rate and issues a Critical alert when the request arrival rate is higher than 1000 per second. The formula is:

If

WebSphere_XD_ODR.Request_Arrived_Rate is greater than 1000 and WebSphere_XD_ODR.Row_Type equals Application

then

the situation XDVEAppReqArrivedRateHigh is true.

Note: You must run this situation XDVEAppReqArrivedRateHigh manually.

XDVEAppReqAboveGoalPercentHigh monitors the number of application requests above the response time threshold during the sampling interval and issues a Critical alert when the average request response time is 0.5 percent. The formula is:

If

WebSphere_XD_ODR.Requests_Above_Goal_Percent is greater than 0.5 and WebSphere_XD_ODR.Row_Type equals Application

then

the situation XDVEAppReqAboveGoalPercentHigh is true.

XDVEAppReqTimedOutPercentHigh monitors the percentage of application requests that time out and issues a Critical alert when the percent of timed-out requests is higher than 0.5 percent. The formula is:

If

WebSphere_XD_ODR.Request_Timed_Out_Percent is greater than 0.5 and WebSphere_XD_ODR.Row_Type equals Application

then

the situation XDVEAppReqTimedOutPercentHigh is true.

XDVEServerMaintenance monitors the need for server maintenance and issues a Critical alert when a server requires maintenance. The formula is:

If

WebSphere_XD_ODR.Server_State equals Maintenance and WebSphere_XD_ODR.Row_Type equals Server

then

the situation XDVEServerMaintenance is true.

XDVEDynClusterPartlyRunning monitors for any dynamic clusters that are partially running and issues a Critical alert when this is the case. A cluster is considered partially running when some servers are active, but the number of active servers is lower than the configured minimum amount of instances in the cluster. For example, if a cluster is configured to run with a minimum of four instances, but only three are active, the cluster is partially running. The formula is:

If

WebSphere_XD_Dynamic_Clusters.Cluster_State equals Partially_Running

then

the situation WASPortletResponseTime is true.

XDVESPolicyTaskOpen searches for open service policy violation tasks and issues a Critical alert when one occurs. The formula is:

If

WebSphere_XD_Policy_Violations.Service_Policy is not equal to "empty string"

then

the situation XDVESPolicyTaskOpen is true.

XDCGJobSchNotRunning monitors the connectivity of the Job Scheduler servers and issues a Critical alert when a Job Scheduler server is not running. The formula is:

If

WebSphere_XD_Compute_Grid.Job_Scheduler_Servers_Running equals Cell and WebSphere_XD_Compute_Grid.Row_Type equals Cell

then

the situation XDCGJobSchNotRunning is true.

XDCGJobSchQueueLengthHigh monitors the Job Scheduler queue length and issues a Critical alert when the queue length is higher than 5000 per second. The formula is:

If

WebSphere_XD_Compute_Grid.Jobs_in_Queue is greater than 5000 and WebSphere_XD_Compute_Grid.Row_Type equals Job_Scheduler_Server

then

the situation XDCGJobSchQueueLengthHigh is true.

XDCGJobSchDispErrorPercentHigh monitors the percentage of job scheduler jobs that fail and issues a Critical alert when a job fails. The formula is:

If

WebSphere_XD_Compute_Grid.Average_Job_Dispatch_Error_Time is greater than 0 and WebSphere_XD_Compute_Grid.Row_Type equals Job_Scheduler_Server

then

the situation XDCGJobSchDispErrorPercentHigh is true.

XDCGJobExcessiveTotalTime monitors the duration time of a job and issues a Critical alert when the job execution time is longer than one day (1440 mins). The formula is:

If

WebSphere_XD_Jobs.Total_Time is greater than 1440

then

the situation XDCGJobExcessiveExecTotalTime is true.

XDCGJobExcessiveQueueTime monitors job queue time and issues a Critical alert when the job is in a queue for longer than 10 minutes. The formula is:

If

WebSphere_XD_Jobs.Queue_Time is greater than 10

then

the situation XDCGJobExcessiveQueueTime is true.

WebSphere Extreme Scale overview for ITCAM Agent for WebSphere Applications

ITCAM Agent for WebSphere Applications provides monitoring for WebSphere Extreme Scale deployment. You can configure monitoring for an Extreme Scale zone, or several zones, under the node for any server belonging to the zone or zones. You can drill down to view information for different servers, map sets, and partitions within the zone or zones.

WebSphere Extreme Scale prerequisites

For WebSphere Extreme Scale monitoring, your environment must meet the following conditions.

- In the WebSphere Extreme Scale server properties file, statistics must be enabled. For details, see the WebSphere Extreme Scale Administration Guide, in the section on monitoring with managed beans (MBeans).
- ITCAM Agent for WebSphere Applications must be installed on at least one server in the monitored Extreme Scale zone, with Catalog Service enabled on the server. Alternatively, the Agent can be installed on a different host with good network connectivity to such a server.
- For hung thread detection, ITCAM Agent for WebSphere Applications must be installed, and the data collector must be configured, for every monitored Extreme Scale server. If the data collector is not configured for any server, hung thread detection does not work for it, but all other metrics remain available.

WebSphere Extreme Scale Workspaces

Use workspaces to configure monitoring of an Extreme Scale zone and to view monitoring information.

WebSphere Extreme Scale configuration workspace

Use the WebSphere Extreme Scale configuration workspace to configure monitoring for a WebSphere Extreme Scale zone.

After creating an Extreme Scale zone node using the WXS_Add_Zone Take Action command (see "WXS_Add_Zone: add a zone node" on page 371), you must configure it using this workspace. The monitoring workspaces for the zone do not display any data before you configure it. You can also change this configuration at a later time.

Attention: Before configuring monitoring for a security-enabled WebSphere Extreme Scale environment, you must complete additional configuration steps, as described in the *IBM Tivoli Composite Application Manager: Agent for WebSphere Applications Installation and Configuration Guide*. Otherwise, the monitoring might fail.

This workspace includes the following tabs:

- Connection Settings
- Security Settings
- Collection Settings

Connection Settings tab

Specify WebSphere Extreme Scale zone information, including catalog servers, in this tab. The agent uses the catalog servers to retrieve monitoring information about the zone.

The Connection Settings tab contains the following fields for the zone:

- **Zone Name** The name of the zone to monitor. You can also specify * to monitor aggregated information for all zones that include the listed catalog servers.
- **Connection type** The type of the zone: **Embedded WAS** if catalog servers running within WebSphere application servers, or **Standalone** if it is running as stand-alone containers (with their own JVMs).

It also contains a table of catalog servers, listing all the servers that are configured or discovered. The table shows the following information:

- **Info** Blank if the agent has connected to the server successfully. If the connection has failed, the column contains a red icon. Place the mouse cursor over the icon to display details about the failure.
- **Server Name** The catalog name for the catalog server. If the catalog name detected at the configured host and port is different, the agent marks the catalog server as `OUT_OF_SYNC` in the Catalogs workspace. You can set * as the catalog host. In this case, the agent detects the name when connecting to the server for the first time.
- **Host name** The host name of the catalog server. For best performance, configure WebSphere Extreme Scale monitoring under a node corresponding to a server within the monitored zone, with Catalog Service enabled. In this case, use `localhost` for this field. Alternatively, to monitor a different server, enter its hostname in this field.
- **Port number** The RMI port for the catalog server. The default value is 1099 for WebSphere Extreme Scale stand-alone, 9809 for embedded WebSphere Application Server.

Before you configure a catalog server for the zone, the agent does not monitor the zone. You can only view default settings in the other tabs of this workspace. To start monitoring a zone, you must provide information about at least one catalog serve for the zone. The server must be running and available.

After you configure a server and monitoring starts, the agent discovers other catalog servers. When you open the configuration window again, you can see the discovered servers added to the table.

To configure the settings for a catalog server for the zone, enter the settings in the fields and click **Add**. You can enter * for the server name; in this case, the agent determines the name automatically. You must enter the host name and port number.

To change the settings for a catalog server, select it in the table, modify the settings in the fields and click **Modify**.

To remove a catalog server from the table, select it in the table and click **Remove**. Use this option for catalog servers that are no longer active. If you remove a catalog server that is still active, the agent discovers it later and adds it to the table again.

Important: If the server is monitored by a version of the agent older than 7.2, this workspace contains information for one catalog server only. You can set the zone name, catalog server name and hostname, port number, and connection type.

Attention: If the server is monitored by a version of the agent older than 7.2 and the catalog server name changes after configuration, the agent reports a connection error. To fix this error, use the configuration workspace again.

Security Settings tab

If JMX connection security (SOAP SSL) is enabled on WebSphere Extreme Scale Catalog Service, specify the security and authentication information in this tab.

The Security Settings tab contains the following fields:

- **Connector Security Is Enabled** Select `TRUE` if JMX connection security is enabled on WebSphere Extreme Scale Catalog Service. Otherwise, select `FALSE`; the default setting is `FALSE`.
- **User** The user name for authentication with the WebSphere Extreme Scale Catalog Service JMX connection.
- **Password**, **Confirm Password** The password for authentication with the WebSphere Extreme Scale Catalog Service JMX connection.
- **SSL Trust Store File** The path to the SSL Trust Store File.
- **SSL Trust Store Password**, **Confirm SSL Trust Store Password** The password for the SSL Trust Store.
- **SSL Trust Store Type** The type of the SSL trust store.

Important: All paths in this tab must be set for the server on which the Agent is installed, that is, the server represented by the node under which the WebSphere Extreme Scale zone node is located.

Collection Settings tab

You can modify settings for collection of monitoring information from WebSphere Extreme Scale in this tab.

The Collection Settings tab contains the following fields:

- **Discovery Interval (seconds)** Interval for discovering grid topology changes, such as new container or catalog services added to the zone.
- **Collection Interval (seconds)** Interval for collecting all Extreme Scale metrics from the Catalog Service (using MBeans).
- **Hung ThreadsMonitoring** Enables or disables monitoring of hung threads inside Extreme Scale JVM processes on all servers within the zone.

  Important: For hung thread detection, ITCAM Agent for WebSphere Applications must be installed, and the data collector must be configured, for every monitored Extreme Scale server.
- **Hung Thread Detection Timeout (seconds)** Timeout for detecting hung threads.

Accessing the WebSphere Extreme Scale configuration workspace

To access the workspace, complete the following steps:

- Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.

- Within the node list, expand the entry that corresponds to the server node.
- Within that node list of monitored applications, expand the WebSphere agent.
- Under the WebSphere agent, expand **WebSphere XS Zone**.
- Under the **WebSphere XS Zone**, select the Extreme Scale zone node of your choice.
- Right-click, and choose **WebSphere XS Zone – Configuration**.

To create an Extreme Scale zone node, use the WXS_Add_Zone Take Action, see "WXS_Add_Zone: add a zone node" on page 371.

WebSphere Extreme Scale Zone Summary workspace

This workspace shows the summary statistics for the monitored Extreme Scale zones. It is available if more than one zone node is configured for an agent node.

This workspace displays data provided by the "Extreme Scale Grids attributes" on page 360,"Extreme Scale Map attributes" on page 362 and "Extreme Scale Servers attributes" on page 358.

The predefined workspace contains the following items:

- Situation Event Console, which shows the event log for all Extreme Scale events on this agent node.
- Transaction Times History graph, which shows the history and real-time value for the average transaction time for every configured zone node.
- Transaction Rates History graph, which shows the history and real-time value for the average transaction rate for every configured zone node.
- Hit Rates History graph, which shows the history and real-time value for the average map hit rate for every configured zone node.
- Available Processors History graph, which shows the history and real-time value for the number of available CPUs in every configured zone node.
- Memory History graph, which shows the history and real-time values for the total used and free JVM heap memory, in megabytes, in every configured zone node.

From all the graphs, you can select the **WebSphere XS Zone** link to open the "WebSphere Extreme Scale Zone workspace" for the selected zone.

Accessing the WebSphere Extreme Scale Zone Summary workspace

Under an Agent for WebSphere Applications node for which two or more Extreme Scale zone nodes are configured, select the **WebSphere XS Zone** node.

WebSphere Extreme Scale Zone workspace

This workspace shows the common statistics for a monitored Extreme Scale zone node.

This workspace displays data provided by the "Extreme Scale Grids attributes" on page 360,"Extreme Scale Map attributes" on page 362 and "Extreme Scale Servers attributes" on page 358.

The predefined workspace contains the following items:

- Situation Event Console, which shows the event log for all Extreme Scale events for this zone node.

- Transaction Times history graph, which shows the history and real-time value for the average transaction time for this zone node.
- Transaction Rate history graph, which shows the history and real-time value for the average transaction rate for this zone node.
- Map Hit Rates graph, which shows the history and real-time value for the average map hit rate for this zone node.
- Available Processors graph, which shows the history and real-time value for the number of available CPUs in this zone node.
- Heap Memory History graph, which shows the history and real-time values for the total used and free JVM heap memory, in megabytes, for this zone node.

Accessing the WebSphere Extreme Scale Zone workspace

To access the workspace, complete the following steps:

- Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
- Within the node list, expand the entry that corresponds to the server node.
- Within that node list of monitored applications, expand the WebSphere agent.
- Under the WebSphere agent, expand **WebSphere XS Zone**.
- Under the **WebSphere XS Zone**, select the Extreme Scale zone node of your choice.

Catalogs workspace

This workspace shows the statistics for the catalog services running within a monitored Extreme Scale zone node.

This workspace displays data provided by the "Extreme Scale Catalog attributes" on page 355.

The predefined workspace contains the following items:

- Situation Event Console, which shows the event log for catalog-related Extreme Scale events for this zone node.
- Active Catalogs History graph, displaying the history and real-time value for the numbers of active catalog services and of catalog services that have a quorum.
- Catalog Services table, displaying the attributes and statistics for every catalog service in the zone node.

Accessing the Catalogs workspace

To access the workspace, complete the following steps:

- Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
- Within the node list, expand the entry that corresponds to the server node.
- Within that node list of monitored applications, expand the WebSphere agent.
- Under the WebSphere agent, expand **WebSphere XS Zone**.
- Under the **WebSphere XS Zone**, expand the Extreme Scale zone node of your choice.
- Under the Extreme Scale zone node of your choice, select the **Catalogs** node.

Containers workspace

This workspace shows the statistics, including hung threads, for the Grid containers running within a monitored Extreme Scale zone node.

This workspace displays data provided by the "Extreme Scale Servers attributes" on page 358 and the "Extreme Scale Thread Pools attributes" on page 368.

The predefined workspace contains the following items:

- Situation Event Console, which shows the event log for all Extreme Scale events for this zone node.
- Container Servers Summary table, displaying the attributes and statistics, including hung threads, for every server JVM in the zone node.
- Highest Memory Used: by Server bar chart, displaying the memory usage for the server JVMs that consume most memory.
- Highest Active Threads: by Server bar chart, displaying the active thread count for the server JVMs that are, or were, running the highest number of threads. Only available for WebSphere Extreme Scale 7.1.

To view detailed statistics for the server, use the following links from the Container Servers Summary table and from the bar charts:

Selected Server To view the "Selected Containers workspace" for the server.

Selected Server – Transactions To view the "Transactions – Selected Level workspace" on page 342 for the server.

Selected Server – Maps To view the "Maps – Selected Level workspace" on page 347 for the server.

Selected Server – Shards To view the "Shards – Selected Level workspace" on page 351 for the server.

Accessing the Containers workspace

To access the workspace, complete the following steps:

- Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
- Within the node list, expand the entry that corresponds to the server node.
- Within that node list of monitored applications, expand the WebSphere agent.
- Under the WebSphere agent, expand **WebSphere XS Zone**.
- Under the **WebSphere XS Zone**, expand the Extreme Scale zone node of your choice.
- Under the Extreme Scale zone node of your choice, select the **Containers** node.

Selected Containers workspace

This workspace shows the statistics for a Grid container (server) JVM running within a monitored Extreme Scale zone node.

This workspace displays data provided by the "Extreme Scale Servers attributes" on page 358,"Extreme Scale Grids attributes" on page 360, and "Extreme Scale Thread Pools attributes" on page 368.

The predefined workspace contains the following items:

- JVM Memory History graph, displaying the history and real-time value for the free and used JVM memory on the server. Only available for WebSphere Extreme Scale 7.1.
- Maps Memory History graph, displaying the history and real-time value for the estimated memory used by every map running on the server. This value

includes only the memory that every map uses on this server, and not on other servers. Only available for WebSphere Extreme Scale 7.1.

- Transaction Times history graph, which shows the average transaction time history and real-time value for the server.
- Threads Activity history graph, which shows the active thread count and maximum thread pool size history and real-time values for the server. Only available for WebSphere Extreme Scale 7.1.
- Server Summary table, displaying the attributes and statistics for the server.

To view detailed statistics for the server, select any item in table or the graphs, right click, and select one of the following links:

- **Selected Server – Transactions** To see the "Transactions – Selected Level workspace" on page 342 workspace for the server.
- **Selected Server – Maps** To see the "Maps – Selected Level workspace" on page 347 workspace for the server.
- **Selected Server – Shards** To see the "Shards – Selected Level workspace" on page 351 workspace for the server.

Accessing the Selected Containers workspace

To access the workspace, complete the following steps:

- Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
- Within the node list, expand the entry that corresponds to the server node.
- Within that node list of monitored applications, expand the WebSphere agent.
- Under the WebSphere agent, expand **WebSphere XS Zone**.
- Under the **WebSphere XS Zone**, expand the Extreme Scale zone node of your choice.
- Under the Extreme Scale zone node of your choice, select the **Containers** node.
- In the "Containers workspace" on page 338, select a server in a table or bar chart, right click, and select **Selected Server**.

Grids workspace

This workspace shows the statistics for the Grids running within a monitored Extreme Scale zone node.

This workspace displays data provided by the "Extreme Scale Placements attributes" on page 367.

The predefined workspace contains the following items:

- Situation Event Console, which shows the event log for all grid-related Extreme Scale events for this zone node.
- Outstanding Work Items History graph, displaying the history and current values for the number of outstanding work items (that is, requests that have not yet been completed) for every grid within the zone node.
- Active Containers History graph, displaying the history and current values for the number of active containers (JVM server processes) for every grid within the zone node.
- Grids Summary table, displaying the attributes and statistics for every combination of grid and map set in the zone node.

To view detailed statistics for any grid, use the following links from the Grids Summary table and from the graphs:

Selected Grid – Transactions To view the “Transactions – Selected Level workspace” on page 342 for the grid.

Selected Grid – Maps To view the “Maps – Selected Level workspace” on page 347 for the grid.

Selected Grid – Shards To view the “Shards – Selected Level workspace” on page 351 for the grid.

Accessing the Grids workspace

To access the workspace, complete the following steps:

- Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
- Within the node list, expand the entry that corresponds to the server node.
- Within that node list of monitored applications, expand the WebSphere agent.
- Under the WebSphere agent, expand **WebSphere XS Zone**.
- Under the **WebSphere XS Zone**, expand the Extreme Scale zone node of your choice.
- Under the Extreme Scale zone node of your choice, select the **Grids** node.

Transactions workspace

This workspace shows information on grid and server transaction rates and transaction response times in a monitored Extreme Scale zone node. The information is aggregated on the grid level (aggregated across servers) and on the server level.

This workspace displays data provided by the “Extreme Scale Grids attributes” on page 360.

The predefined workspace contains the following items:

- Situation Event Console, which shows the event log for all transaction-related Extreme Scale events for the zone node.
- Transaction Times History: Grids graph, displaying the history and real-time values for average transaction times for every grid in the zone node.
- Transaction Rates History: Grids graph, displaying the history and real-time values for average transaction rates for every grid in the zone node.
- Longest Transaction Times: by Server bar chart, displaying the servers with the highest average transaction time values for this zone node. In this table, you can see the specific server JVMs that have, or recently had, the longest transaction times.
- Highest Transaction Rates: by Server bar chart, displaying the servers with the highest transaction rate values for this zone node. In this table, you can see the specific server JVMs that have, or recently had, the highest transaction rates.

To view detailed transaction statistics for a grid, select the grid in the **Transaction Times History: Grids** or the **Transaction Rates History: Grids** graph. Then right click and select **Selected Grid – Transactions**. The system displays the “Transactions – Selected Level workspace” on page 342 for the grid.

To view detailed transaction statistics for a server, select the server in the **Longest Transaction Times: by Server** or the **Highest Transaction Rates: by Server** bar

chart. Then right click and select **Selected Server – Transactions**. The system displays "Transactions – Selected Level workspace" for the server.

To view container details for a server, select the server in the **Longest Transaction Times: by Server** or the **Highest Transaction Rates: by Server** bar chart. Then right click and select **Selected Server – Containers**. The system displays the "Selected Containers workspace" on page 339 for the server.

Accessing the Transactions workspace

To access the workspace, complete the following steps:

- Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
- Within the node list, expand the entry that corresponds to the server node.
- Within that node list of monitored applications, expand the WebSphere agent.
- Under the WebSphere agent, expand **WebSphere XS Zone**.
- Under the **WebSphere XS Zone**, expand the Extreme Scale zone node of your choice.
- Under the Extreme Scale zone node of your choice, select the **Transactions** node.

Transactions – Selected Level workspace

This workspace shows information about transaction rates and transaction response times in a selected server, grid, or map set within the monitored Extreme Scale environment.

This workspace displays data provided by the "Extreme Scale Grids attributes" on page 360.

The exact content of the workspace depends on whether it is invoked for a server, grid, or map set.

Transactions – Selected Grid

This workspace contains transaction data for a grid, aggregated from all servers.

The predefined workspace contains the following items:

- Transactions Summary table, which shows the attributes and statistics for map sets available in the grid.
- Transaction Rates History graph, displaying the history and real-time values for average transaction rates for every map set in the grid.
- Transaction Times History graph, displaying the history and real-time values for average transaction times for every map set in the grid.
- Highest Transaction Rates bar chart, displaying the transaction rate on servers that have, or recently had, the highest transaction rates.
- Longest Transaction Times bar chart, displaying the transaction time on servers that have, or recently had, the longest transaction times.

To view detailed transaction statistics for a map set, select the map set in the **Transactions Summary** table or in the **Transaction Rates History** or the **Transaction Times History** graph. Then right click and select **Selected Map Set – Transactions**. The system displays the "Transactions – Selected Level workspace" for the map set.

To view detailed transaction statistics for a server, select the server in the **Highest Transaction Rates** or the **Longest Transaction Times** bar chart. Then right click and select **Selected Server – Transactions**. The system displays the "Transactions – Selected Level workspace" on page 342 for the server.

To view container details for a server, select the server in the **Highest Transaction Rates** or the **Longest Transaction Times** bar chart. Then right click and select **Selected Server – Containers**. The system displays the "Selected Containers workspace" on page 339 for the server.

To view map information for the same grid, select any row in the **Transactions Summary** table. Then right click and select **Selected Level – Maps**. The system displays the "Maps – Selected Level workspace" on page 347 for the grid.

To view shard information for the same grid, select any row in the **Transactions Summary** table. Then right click and select **Selected Level – Shards**. The system displays the "Shards – Selected Level workspace" on page 351 for the grid.

Transactions – Selected Server

This workspace contains transaction data for a single server.

The predefined workspace contains the following items:

- Transactions Summary table, which shows the attributes and summary transaction statistics for map sets available in the server.
- Transaction Rates History graph, displaying the history and real-time values for average transaction rates for every map set on the server.
- Transaction Times History graph, displaying the history and real-time values for average transaction times for every map set on the server.
- Highest Transaction Rates bar chart, displaying the transaction rate on shards that have, or recently had, the highest transaction rates.
- Longest Transaction Times bar chart, displaying the transaction time on shards that have, or recently had, the longest transaction times.

To view detailed transaction statistics for a map set, select the map set in the **Transactions Summary** table or in the **Transaction Rates History** or the **Transaction Times History** graph. Then right click and select **Selected Map Set – Transactions**. The system displays the "Transactions – Selected Level workspace" on page 342 for the map set.

To view detailed transaction statistics for a shard, select the shard in the **Highest Transaction Rates** or the **Longest Transaction Times** bar chart. Then right click and select **Selected Partition – Transactions**. The system displays the "Transactions – Selected Partition workspace" on page 345 for the partition corresponding to the shard.

To view container details for the server, select any shard in the **Highest Transaction Rates** or **Longest Transaction Times** bar chart. Then right click and select **Selected Server – Containers**. The system displays the "Selected Containers workspace" on page 339 for the server.

To view map information for the same server, select any row in the **Transactions Summary** table. Then right click and select **Selected Level – Maps**. The system displays the "Maps – Selected Level workspace" on page 347 for the server.

To view shard information for the same server, select any row in the **Transactions Summary** table. Then right click and select **Selected Level – Shards**. The system displays the "Shards – Selected Level workspace" on page 351 for the server.

Transactions – Selected Map Set

This workspace displays transaction data for a map set aggregated among all servers (if called from a Selected Grid workspace) or on one server (if called from a Selected Server workspace).

The predefined workspace contains the following items:

- Transactions Summary table, which shows the attributes and summary transaction statistics for the map set. This table has one row.
- Transaction Rates History graph, displaying the history and real-time value for the average transaction rate for the map set.
- Transaction Times History graph, displaying the history and real-time value for average transaction time for the map set.
- Highest Transaction Rates bar chart, displaying the transaction rate for the shards that have, or recently had, the highest transaction rates.
- Longest Transaction Times bar chart, displaying the transaction time for the shards that have, or recently had, the longest transaction times.

To view detailed transaction statistics for a shard, select the shard in the **Highest Transaction Rates** or the **Longest Transaction Times** bar chart. Then right click and select **Selected Partition – Transactions**. The system displays the "Transactions – Selected Partition workspace" on page 345 for the partition corresponding to the shard.

To view container details for the server running a shard, select the shard in the **Highest Transaction Rates** or the **Longest Transaction Times** bar chart. Then right click and select **Selected Server – Containers**. The system displays the "Selected Containers workspace" on page 339 for the server.

To view shard information for the same map set, select the row in the **Transactions Summary** table. Then right click and select **Selected Level – Shards**. The system displays the "Shards – Selected Level workspace" on page 351 for the map set.

Accessing the Transactions – Selected Level workspace

To access the workspace, complete the following steps:

- Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
- Within the node list, expand the entry that corresponds to the server node.
- Within that node list of monitored applications, expand the WebSphere agent.
- Under the WebSphere agent, expand **WebSphere XS Zone**.
- Under the **WebSphere XS Zone**, expand the Extreme Scale zone node of your choice.
- Under the Extreme Scale zone node of your choice, select the **Transactions** node.
- Complete one of the following steps:
  - To view the **Transactions – Selected Level** workspace for a grid, select the grid in the **Transaction Times History: Grids** or the **Transaction Rates History: Grids** graph. Then right click and select **Selected Grid – Transactions**.

  - To view the **Transactions – Selected Level** workspace for a server, select the server in the **Longest Transaction Times: by Server** or the **Highest Transaction Rates: by Server** bar chart. Then right click and select **Selected Server – Transactions**
- To view the **Transactions – Selected Level** workspace for a map set, view it for a grid or server as described in the previous step. Then, select the map set in the **Transactions Summary** table, right click, and select **Selected Map Set – Transactions**.

Transactions – Selected Partition workspace

This workspace shows information about transaction rates and transaction response times in a selected partition within the monitored Extreme Scale environment.

This workspace displays data provided by the "Extreme Scale Grids attributes" on page 360.

The predefined workspace contains the following items:

- Transactions Summary table, which shows the attributes and summary transaction statistics for the partition shards, that is, the shards that belonged to the partition within the history time span for the workspace (by default, the last 2 hours).
- Transaction Rates History graph, displaying the history and real-time values for average transaction rates for the partition shards.
- Transaction Times History graph, displaying the history and real-time values for average transaction times for the partition shards.

To view container details for the server running a shard, select the shard in the **Transactions Summary** table. Then right click and select **Selected Server – Containers**. The system displays the "Selected Containers workspace" on page 339 for the server.

To view map information for the same partition, select any row in the **Transactions Summary** table. Then right click and select **Selected Level – Maps**. The system displays the "Maps – Selected Partition workspace" on page 349 for the partition.

To view shard information for the same partition, select any row in the **Transactions Summary** table. Then right click and select **Selected Level – Shards**. The system displays the "Shards – Selected Partition workspace" on page 354 for the partition.

Accessing the Transactions – Selected Partition workspace

To access the workspace, complete the following steps:

- Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
- Within the node list, expand the entry that corresponds to the server node.
- Within that node list of monitored applications, expand the WebSphere agent.
- Under the WebSphere agent, expand **WebSphere XS Zone**.
- Under the **WebSphere XS Zone**, expand the Extreme Scale zone node of your choice.
- Under the Extreme Scale zone node of your choice, select the **Transactions** node.

- Select a server in the **Longest Transaction Times: by Server** or the **Highest Transaction Rates: by Server** bar chart. Then right click and select **Selected Server – Transactions**.
- Select a shard in the **Highest Transaction Rates** or the **Longest Transaction Times** bar chart. Then right click and select **Selected Partition – Transactions**.

Maps workspace

This workspace shows information about map counts and map hit rates in a monitored Extreme Scale zone node. The information is aggregated on the grid and server levels.

This workspace displays data provided by the "Extreme Scale Map attributes" on page 362.

The predefined workspace contains the following items:

- Situation Event Console, which shows the event log for all map-related Extreme Scale events for this zone node.
- Hit Rates History: Grids graph, displaying the history and real-time values for average map hit rates for every grid in the zone node.
- Map Counts History: Grids graph, displaying the history and real-time values for map counts for every grid in the zone node.
- Lowest Hit Rates: by Server bar chart, displaying hit rate for the server JVMs that have, or recently had, the lowest hit rates.
- Highest Map Counts: by Server bar chart, displaying the map count for the server JVMs that have, or recently had, the highest map counts.

To view detailed map statistics for a grid, select the grid in the **Hit Rates History: Grids** or the **Map Counts History: Grids** graph. Then right click and select **Selected Grid – Maps**. The system displays the "Maps – Selected Level workspace" on page 347 for the grid.

To view detailed map statistics for a server, select the server in the **Lowest Hit Rates: by Server** or the **Highest Map Counts: by Server** bar chart. Then right click and select **Selected Server – Maps**. The system displays the "Maps – Selected Level workspace" on page 347 for the server.

To view container details for a server, select the server in the **Lowest Hit Rates: by Server** or the **Highest Map Counts: by Server** bar chart. Then right click and select **Selected Server – Containers**. The system displays the "Selected Containers workspace" on page 339 for the server.

Accessing the Maps workspace

To access the workspace, complete the following steps:

- Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
- Within the node list, expand the entry that corresponds to the server node.
- Within that node list of monitored applications, expand the WebSphere agent.
- Under the WebSphere agent, expand **WebSphere XS Zone**.
- Under the **WebSphere XS Zone**, expand the Extreme Scale zone node of your choice.
- Under the Extreme Scale zone node of your choice, select the **Maps** node.

Maps – Selected Level workspace

This workspace shows information about map counts and hit rates in a selected server, grid, or map set within the monitored Extreme Scale environment.

This workspace displays data provided by the "Extreme Scale Map attributes" on page 362.

The exact content of the workspace depends on whether it is invoked for a server, grid, or map set.

Maps – Selected Grid

This workspace contains map data for a grid, aggregated from all servers.

The predefined workspace contains the following items:

- Maps Summary table, which shows the attributes and statistics for maps available in the grid.
- Hit Rates History graph, displaying the history and real-time values of the map hit rate for every map in the grid.
- Map Counts History graph, displaying the history and real-time values of the map count for every map in the grid.
- Lowest Hit Rates bar chart, displaying the hit rate for the server JVMs that have, or recently had, the lowest hit rates.
- Highest Map Counts bar chart, displaying the map count for the server JVMs that have, or recently had, the highest map counts.

To view detailed map statistics for a map, select the map in the **Maps Summary** table or in the **Hit Rates History** or the **Map Counts History** graph. Then right click and select **Selected Map – Maps**. The system displays the"Maps – Selected Level workspace" for the map.

To view detailed map statistics for a server, select the server in the **Lowest Hit Rates** or the **Highest Map Counts** bar chart. Then right click and select **Selected Server – Maps**. The system displays the "Maps – Selected Level workspace" for the server.

To view container details for a server, select the server in the **Lowest Hit Rates** or the **Highest Map Counts** bar chart. Then right click and select **Selected Server – Containers**. The system displays the "Selected Containers workspace" on page 339 for the server.

To view transaction information for the same grid, select any row in the **Maps Summary** table. Then right click and select **Selected Level – Transactions**. The system displays the "Transactions – Selected Level workspace" on page 342 for the grid.

To view shard information for the same grid, select any row in the **Selected Maps** table. Then right click and select **Selected Level – Shards**. The system displays the "Shards – Selected Level workspace" on page 351 for the grid.

Maps – Selected Server

This workspace contains map data for a single server.

The predefined workspace contains the following items:

- Maps Summary table, which shows the attributes and statistics for maps available on the server.
- Hit Rates History graph, displaying the history and real-time values of the map hit rate for every map on the server.
- Map Counts History graph, displaying the history and real-time values of the map count for every map on the server.
- Lowest Hit Rates bar chart, displaying the hit rate for the shards on this server that have, or recently had, the lowest map hit rates.
- Highest Map Counts bar chart, displaying map count for the shards on this server that have, or recently had, the highest map counts.

To view detailed map statistics for a map, select the map in the **Maps Summary** table or in the **Hit Rates History** or the **Map Counts History** graph. Then right click and select **Selected Map – Maps**. The system displays the"Maps – Selected Level workspace" on page 347 for the map.

To view detailed map statistics for a shard, select the shard in the **Lowest Hit Rates** or the **Highest Map Counts** bar chart. Then right click and select **Selected Partition – Maps**. The system displays the "Maps – Selected Partition workspace" on page 349 for the partition corresponding to the shard.

To view container details for the server, select any shard in the **Lowest Hit Rates** or the **Highest Map Counts** bar chart. Then right click and select **Selected Server – Containers**. The system displays the "Selected Containers workspace" on page 339 for the server.

To view transaction information for the same server, select any row in the **Maps Summary** table. Then right click and select **Selected Level – Transactions**. The system displays the "Transactions – Selected Level workspace" on page 342 for the server.

To view shard information for the same server, select any row in the **Maps Summary** table. Then right click and select **Selected Level – Shards**. The system displays the "Shards – Selected Level workspace" on page 351 for the server.

Maps – Selected Map

This workspace displays map data for a map aggregated among all servers (if called from a Selected Grid workspace) or on one server (if called from a Selected Server workspace).

The predefined workspace contains the following items:

- Maps Summary table, which shows the attributes and statistics for the map. This table has one row.
- Hit Rates History graph, displaying the history and real-time value of the map hit rate for the map.
- Map Counts History graph, displaying the history and real-time value of the map count for the map.
- Lowest Hit Rates bar chart, displaying the hit rate for the shards that have, or recently had, the lowest map hit rates.
- Highest Map Counts bar chart, displaying the map count for the shards that have, or recently had, the highest map counts.

To view detailed map statistics for a shard, select the shard in the **Lowest Hit Rates** or the **Highest Map Counts** bar chart. Then right click, and select **Selected Partition – Maps**. The system displays the "Maps – Selected Partition workspace" for the partition corresponding to the shard.

To view container details for the server running a shard, select the shard in the **Lowest Hit Rates** or the **Highest Map Counts** bar chart. Then right click and select **Selected Server – Containers**. The system displays the "Selected Containers workspace" on page 339 for the server.

Accessing the Maps – Selected Level workspace

To access the workspace, complete the following steps:

- Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
- Within the node list, expand the entry that corresponds to the server node.
- Within that node list of monitored applications, expand the WebSphere agent.
- Under the WebSphere agent, expand **WebSphere XS Zone**.
- Under the **WebSphere XS Zone**, expand the Extreme Scale zone node of your choice.
- Under the Extreme Scale zone node of your choice, select the **Maps** node.
- Perform one of the following steps:
  - To view the Maps – Selected Level workspace for a grid, select the grid in the **Hit Rates History: Grids** or the **Map Counts History: Grids** graph. Them right click and select **Selected Grid – Maps**.
  - To view the Maps – Selected Level workspace for a server, select the server in the **Lowest Hit Rates: by Server** or the **Highest Map Counts: by Server** bar chart. Then right click and select **Selected Server – Maps**.
- To view the Maps – Selected Level workspace for a map, view it for a grid or server as described in the previous step. Then, select the map in the **Maps Summary** table, right click, and select **Selected Map – Maps**.

Maps – Selected Partition workspace

This workspace shows information about map counts and hit rates in a selected partition within the monitored Extreme Scale environment.

This workspace displays data provided by the "Extreme Scale Map attributes" on page 362.

The predefined workspace contains the following items:

- Maps Summary table, which shows the attributes and summary map statistics for the partition shards, that is, the shards that belonged to the partition within the history time span for the workspace (by default, the last 2 hours).
- Hit Rates History graph, displaying the history and real-time value of the map hit rate for the partition shards.
- Map Counts History graph, displaying the history and real-time value of the map count for the partition shards.
- Batch Update Times History graph, displaying the history and real-time value of the batch update time for the partition shards.
- Used Memory History graph, displaying the history and real-time amount of the JVM memory used by the partition shards.

To view container details for the server running a shard, select the shard in the **Maps Summary** table. Then right click and select **Selected Server – Containers**. The system displays the "Selected Containers workspace" on page 339 for the server.

To view transaction information for the same partition, select any row in the **Maps Summary** table. Then right click and select **Selected Level – Transactions**. The system displays the "Transactions – Selected Level workspace" on page 342 for the partition.

To view shard information for the same partition, select any row in the **Selected Maps** table. Then right click and select **Selected Level – Shards**. The system displays the "Shards – Selected Partition workspace" on page 354 for the partition.

Accessing the Maps – Selected Partition workspace

To access the workspace, complete the following steps:

- Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
- Within the node list, expand the entry that corresponds to the server node.
- Within that node list of monitored applications, expand the WebSphere agent.
- Under the WebSphere agent, expand **WebSphere XS Zone**.
- Under the **WebSphere XS Zone**, expand the Extreme Scale zone node of your choice.
- Under the Extreme Scale zone node of your choice, select the **Maps** node.
- Select a server in the **Lowest Hit Rates: by Server** or the **Highest Map Counts: by Server** bar chart. Then right click and select **Selected Server – Maps**.
- Select a shard in the **Lowest Hit Rates** or the **Highest Map Counts** bar chart. Then right click and select **Selected Partition – Maps**.

Shards workspace

This workspace shows information about shard request rates and active request counts in a monitored Extreme Scale zone node. The information is aggregated on the grid and server levels.

This workspace displays data provided by the "Extreme Scale Shards attributes" on page 365.

The predefined workspace contains the following items:

- Situation Event Console, which shows the event log for all shard-related Extreme Scale events for this zone node.
- Request Rates History: Grids graph, displaying the history and real-time values for average shard request rates for every grid in the zone node.
- Active Requests History: Grids graph, displaying the history and real-time values for average shard active requests count for every grid in the zone node.
- Highest Request Rates: by Server bar chart, displaying the average shard request rates for the server JVMs that have, or recently had, the highest shard request rates.
- Highest Active Requests: by Server bar chart, displaying the average shard active request counts for the server JVMs that have, or recently had, the highest shard active request counts.

To view detailed shard statistics for a grid, select the grid in the **Request Rates History: Grids** or the **Active Requests History: Grids** graph. Then right click and select **Selected Grid – Shards**. The system displays the "Shards – Selected Level workspace" for the grid.

To view detailed shard statistics for a server, select the server in the **Highest Request Rates: by Server** or the **Highest Active Requests: by Server** bar chart. Then right click and select **Selected Server – Shards**. The system displays the "Shards – Selected Level workspace" for the server.

Accessing the Shards workspace

To access the workspace, complete the following steps:

- Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
- Within the node list, expand the entry that corresponds to the server node.
- Within that node list of monitored applications, expand the WebSphere agent.
- Under the WebSphere agent, expand **WebSphere XS Zone**.
- Under the **WebSphere XS Zone**, expand the Extreme Scale zone node of your choice.
- Under the Extreme Scale zone node of your choice, select the **Shards** node.

Shards – Selected Level workspace

This workspace shows information about shard request rates and active request counts in a selected server, grid, or map set within the monitored Extreme Scale environment.

This workspace displays data provided by the "Extreme Scale Shards attributes" on page 365.

The exact content of the workspace depends on whether it is invoked for a server, grid, or map set.

Shards – Selected Grid

This workspace contains shard data for a grid, aggregated from all servers.

The predefined workspace contains the following items:

- Shards Summary table, which shows the attributes and summary shard statistics for map sets available in the grid.
- Request Rates History graph, displaying the history and real-time values for average shard request rates for every map set in the grid.
- Active Requests History graph, displaying the history and real-time values for average shard active requests count for every map set in the grid.
- Highest Request Rates bar chart, displaying the shard request rate for the server JVMs that have, or recently had, the highest shard request rates.
- Highest Active Requests bar chart, displaying the shard active request count for the server JVMs that have, or recently had, the highest shard active request counts.

To view detailed shard statistics for a map set, select the map set in the Shards Summary table or in the Request Rates History or Active Requests History graph. Then select **Selected Map Set – Shards**. The system displays the"Shards – Selected Level workspace" on page 351 for the map.

To view detailed shard statistics for a server, select the server in the **Highest Request Rates** or the **Highest Active Requests** bar chart. Then right click and select **Selected Server – Shards** . The system displays the "Shards – Selected Level workspace" on page 351 for the server.

To view container details for a server, select the server in the **Highest Request Rates** or the **Highest Active Requests** bar chart. Then right click and select **Selected Server – Containers**. The system displays the "Selected Containers workspace" on page 339 for the server.

To view transaction information for the same grid, select any row in the **Shards Summary** table. Then right click and select **Selected Level – Transactions**. The system displays the "Transactions – Selected Level workspace" on page 342 for the grid.

To view map information for the same grid, select any row in the **Shards Summary** table. Then right click and select **Selected Level – Maps**. The system displays the "Maps – Selected Level workspace" on page 347 for the grid.

Shards – Selected Server

This workspace contains shard data for a single server.

The predefined workspace contains the following items:

- Shards Summary table, which shows the attributes and summary shard statistics for map sets available on the server.
- Request Rates History graph, displaying the history and real-time values for average shard request rates for every map set on the server.
- Active Requests History graph, displaying the history and real-time values for average shard active requests count for every map set on the server.
- Highest Request Rates bar chart, displaying the request rate for the shards that have, or recently had, the highest request rates.
- Highest Active Requests bar chart, displaying the active request count for the shards that have, or recently had, the highest shard active request counts.

To view detailed shard statistics for a map set, select the map set in the **Shards Summary** table or in the **Request Rates History** or the **Active Requests History** graph. Then right click and select **Selected Map Set – Shards**. The system displays the"Shards – Selected Level workspace" on page 351 for the map.

To view detailed shard statistics for a shard, select the shard in the **Highest Request Rates** or the **Highest Active Requests** bar chart. Then right click and select **Selected Partition – Shards**. The system displays the "Shards – Selected Partition workspace" on page 354 for the partition corresponding to the shard.

To view container details for the server, select any shard in the **Highest Request Rates** or the **Highest Active Requests** bar chart. Then right click and select **Selected Server – Containers**. The system displays the "Selected Containers workspace" on page 339 for the server.

To view transaction information for the same server, select any row in the **Shards Summary** table. Then right click and select **Selected Level – Transactions**. The system displays the "Transactions – Selected Level workspace" on page 342 for the server.

To view map information for the same server, select any row in the **Shards Summary** table. Then right click and select **Selected Level – Maps**. The system displays the "Maps – Selected Level workspace" on page 347 for the server.

Shards – Selected Map Set

This workspace displays shard data for a map set aggregated among all servers (if called from a Selected Grid workspace) or on one server (if called from a Selected Server workspace).

The predefined workspace contains the following items:

- Shards Summary table, which shows the attributes and summary shard statistics for the map set. This table has one row.
- Request Rates History graph, displaying the history and real-time value for average shard request rates for this map set.
- Active Requests History graph, displaying the history and real-time value for average shard active requests count for this map set.
- Highest Request Rates bar chart, displaying the request rate for the shards in this map set that have, or recently had, the highest request rates.
- Highest Active Requests bar chart, displaying the active request counts for the shards in this map set that have, or recently had, the highest shard active request counts.

To view detailed shard statistics for a shard, select the shard in the **Highest Request Rates** or the **Highest Active Requests** bar chart. Then right click and select **Selected Partition – Shards**. The system displays the "Shards – Selected Partition workspace" on page 354 for the partition corresponding to the shard.

To view container details for the server running a shard, select the shard in the **Highest Request Rates** or the **Highest Active Requests** bar chart. Then right click and select **Selected Server – Containers**. The system displays the "Selected Containers workspace" on page 339 for the server.

To view transaction information for the same map set, select the row in the **Shards Summary** table. Then right click and select **Selected Level – Transactions**. The system displays the "Transactions – Selected Level workspace" on page 342 for the map set.

Accessing the Shards – Selected Level workspace

To access the workspace, complete the following steps:

- Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
- Within the node list, expand the entry that corresponds to the server node.
- Within that node list of monitored applications, expand the WebSphere agent.
- Under the WebSphere agent, expand **WebSphere XS Zone**.
- Under the **WebSphere XS Zone**, expand the Extreme Scale zone node of your choice.

- Under the Extreme Scale zone node of your choice, select the **Shards** node.
- Perform one of the following steps:
  - To view the **Shards – Selected Level** workspace for a grid, select the grid in the **Request Rates History: Grids** or the **Active Requests History: Grids** graph. Then right click and select **Selected Grid – Shards**.
  - To view the **Shards – Selected Level** workspace for a server, select the server in the **Highest Request Rates: by Server** or the **Highest Active Requests: by Server** bar chart. Then right click and select **Selected Server – Shards**.
- To view the Shards – Selected Level workspace for a map set, view it for a grid or server as described in the previous step. Then, select the map set in the **Shards Summary** table, right click, and select **Selected Map Set – Shards**.

Shards – Selected Partition workspace

This workspace shows information about shard request rates and active request counts in a selected partition within the monitored Extreme Scale environment.

This workspace displays data provided by the "Extreme Scale Shards attributes" on page 365.

The predefined workspace contains the following items:

- Shards Summary table, which shows the attributes and summary shard statistics for the partition shards, that is, the shards that belonged to the partition within the history time span for the workspace (by default, the last 2 hours)..
- Request Rates History graph, displaying the history and real-time value for request rates for the partition shards.
- Active Requests History graph, displaying the history and real-time value for active requests count for the partition shards.
- Forwarded Requests History graph, displaying the history and real-time value for forwarded requests count for the partition shards.

To view container details for the server running a shard, select the shard in the **Shards Summary** table. Then right click and select **Selected Server – Containers**. The system displays the "Selected Containers workspace" on page 339 for the server.

To view transaction information for the same partition, select the row in the **Shards Summary** table. Then right click and select **Selected Level – Transactions**. The system displays the "Transactions – Selected Level workspace" on page 342 for the partition.

To view map information for the same partition, select the row in the **Shards Summary** table. Then right click and select **Selected Level – Maps**. The system displays the "Maps – Selected Partition workspace" on page 349 for the partition.

Accessing the Shards – Selected Partition workspace

To access the workspace, complete the following steps:

- Within the Navigator, expand Windows Systems, Linux Systems, z/OS Systems, or UNIX Systems, as appropriate for the node you are monitoring.
- Within the node list, expand the entry that corresponds to the server node.
- Within that node list of monitored applications, expand the WebSphere agent.
- Under the WebSphere agent, expand **WebSphere XS Zone**.

- Under the **WebSphere XS Zone**, expand the Extreme Scale zone node of your choice.
- Under the Extreme Scale zone node of your choice, select the **Shards** node.
- Select a server in the **Highest Request Rates: by Server** or the **Highest Active Requests: by Server** bar chart. Then right click and select **Selected Server – Shards**.
- Select a shard in the **Highest Request Rates** or the **Highest Active Requests** bar chart. Then right click and select **Selected Partition – Shards**.

WebSphere Extreme Scale Attributes

IBM Tivoli Composite Application Manager Agent for WebSphere Applications uses several attribute groups to store data for WebSphere Extreme Scale monitoring.

Extreme Scale Catalog attributes

The **Extreme Scale Catalog** attributes provide information about the catalog service for the WebSphere Extreme Scale grid.

The attributes within this group are used to build the "Catalogs workspace" on page 338.

Origin Node The server name subnode. The valid format is an alphanumeric string, with a maximum of 32 characters.

Sample Date and Time The date and time at which the agent has collected this data. The valid format is a 16-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 69. Format of the 16-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Interval Time The length of the sample interval in seconds. The valid format is a positive integer.

Server Name The name of the catalog service. The valid format is an alphanumeric string, with a maximum of 48 characters.

Host Name The host name where the catalog service is running. The valid format is an alphanumeric string, with a maximum of 32 characters.

JMX URL The URL for the catalog service JMX connection. The valid format is an alphanumeric string, with a maximum of 192 characters.

Grid Servers The combined number of grid processes (catalog services and container servers) running in the grid. The valid format is a positive integer. For

WebSphere Extreme Scale 7.1 this attribute is collected from the server; for WebSphere Extreme Scale 6.1 and 7.0, the Agent calculates the value by tracking active catalog services in the grid.

Heart Beat Frequency Level The heart beat frequency level, as reported by the WebSphere Extreme Scale MBean. For WebSphere Extreme Scale 6.1 and 7.0, the valid values are `TYPICAL`,`RELAXED` and `AGGRESSIVE`. This information is not available for WebSphere Extreme Scale 7.1; for this version the value is always `LEVEL_OFF`.

Active Catalogs The number of active catalog service processes monitored in the grid, reported by WebSphere Extreme Scale 7.1 MBean or calculated by agent for back-level versions. The valid format is a positive integer. For WebSphere Extreme Scale 7.1 this attribute is collected from the server; for WebSphere Extreme Scale 6.1 and 7.0, the Agent calculates the value.

Quorum Catalogs The number of quorum catalog service processes monitored in the grid. The valid format is a positive integer. This information is only available for WebSphere Extreme Scale 7.1. In WebSphere Extreme Scale 6.1 and 7.0, ignore this value as the WebSphere Extreme Scale MBean does not provide the data.

Is Primary Whether this is the primary catalog service for workspace reports and situation formula checks. The valid values are `YES` and `NO`. The agent discovers the primary catalog service for the grid automatically; the catalog service configured in the agent might not be the primary service.

Attention: For WebSphere Extreme Scale 6.1, this field is set to YES for the randomly selected catalog service that the agent monitors.

Connection Status Agent connection status for the catalog service. The valid values are `ONLINE` and `OFFLINE`; if the value is `OFFLINE`, monitoring information might not be up to date.

Configuration Status Agent configuration status for the catalog service. The valid values are:

- `YES`: this is the catalog service configured in the agent, using the "WebSphere Extreme Scale configuration workspace" on page 334.
- `NO`: this catalog service was automatically discovered via the initially configured service. The agent discovers all catalog services in the grid node.
- `ERROR`: the catalog service connection is not configured. When a zone node is created but not yet configured, or configured incorrectly, no monitoring is performed, but one row is available in the Catalog attributes table with Configuration Status set to `ERROR`.

Quorum Status Indicates the quorum status for the catalog service domain. The valid values are `DISABLE`, `NORMAL`, `WAITING` ,`OVERRIDE`, and `INCONSISTENT`. For WebSphere Extreme Scale 6.1 and 7.0 this attribute is collected from the server; for WebSphere Extreme Scale 7.1, the Agent calculates the value (`DISABLE`, `NORMAL` or `WAITING`).

Monitored Servers The number of container servers on this catalog service that are monitored by the agent. This can be less than the total number of servers on the catalog service; for example, if the catalog service includes servers in multiple zones, but only one zone is configured in the agent, only servers in that zone is included in this value. The valid format is a positive integer.

Extreme Scale Containers attributes

The **Extreme Scale Containers** attributes provide statistics for grid shards running within a Grid Container on a server.

The attributes within this group are not used for any predefined workspace.

Origin Node The server name subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Sample Date and Time The date and time at which the agent has collected data. The valid format is a 16-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 70. Format of the 16-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Interval Time The length of the sample interval in seconds. The valid format is a positive integer.

Server Name The name of the server. The valid format is an alphanumeric string, with a maximum of 48 characters.

Container Name The name of this Grid Container instance. The valid format is an alphanumeric string, with a maximum of 128 characters.

Zone Name The Zone name for this container on this server. The valid format is an alphanumeric string, with a maximum of 128 characters.

Domain Name Domain name of the grid instance within the virtual machine. The valid format is an alphanumeric string, with a maximum of 128 characters. Only available for WebSphere Extreme Scale 7.1.

Core Group The name of core group. The valid format is an alphanumeric string, with a maximum of 32 characters.

Stats Name The name of the map. The valid format is an alphanumeric string, with a maximum of 32 characters.

Active Shard Count The number of active Shards hosted by this container instance. The valid format is a positive integer.

Activated Shard Counts The number of Shards activated in this container instance during the collection interval. The valid format is a positive integer.

Deactivated Shard Count The number of Shards deactivated in this container instance during the collection interval. The valid format is a positive integer.

Stats Level The level of the statistics. The valid values are:

- `CONTAINER`: metrics for a single container.
- `SERVER`: metrics for a single server.
- `COREGROUP`: aggregated metrics for servers in a core group.
- `ZONE`: aggregated metrics for servers in a zone.

Extreme Scale Servers attributes

The **Extreme Scale Servers** attributes provide statistics for a JVM process that hosts all grid components on a server, or aggregated information for JVM processes on several servers.

The attributes within this group are used to build the "WebSphere Extreme Scale Zone Summary workspace" on page 337,"WebSphere Extreme Scale Zone workspace" on page 337"Containers workspace" on page 338 and "Selected Containers workspace" on page 339.

Origin Node The grid zone subnode name. The valid format is an alphanumeric string, with a maximum of 32 characters.

Sample Date and Time The date and time at which the agent has collected data. The valid format is a 16-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 71. Format of the 16-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Interval Time The length of the sample interval in seconds. The valid format is a positive integer.

Server Name The server name. The valid format is an alphanumeric string, with a maximum of 48 characters.

Core Group The name of the core group in which the server is running. The valid format is an alphanumeric string, with a maximum of 32 characters.

Host Name The name of the host on which the server runs.The valid format is an alphanumeric string, with a maximum of 32 characters.

Zone Name The WebSphere Extreme Scale grid zone name. (This is the name configured in Extreme Scale, even if the agent zone node name is different). The valid format is an alphanumeric string, with a maximum of 32 characters.

Available Processors The number of available processors on the server. The valid format is a 4-byte integer.

Free Memory Amount of free memory available on the server JVM process, in megabytes. The valid format is a decimal (formatted to three decimal places).

Max Memory Amount of max memory available on the server JVM process, in megabytes. The valid format is a decimal (formatted to three decimal places).

Used Memory Amount of used memory on the server JVM process, in megabytes. The valid format is a decimal (formatted to three decimal places).

Stats Spec Shows which statistics are available for the server. Normally set to `statsSpec=all=enabled`, meaning that all statistics are available, The valid format is an alphanumeric string, with a maximum of 256 characters. Only available for WebSphere Extreme Scale 7.1.

Is Safe To Shutdown YES if replicas exists for each primary shard hosted by the server. The valid values are `YES` ena `NO`.

Trace Spec The trace specification for the server, in the format Component = Level = [enable|disable]; for example, *=all=enable - tracing is enabled for all components at all levels. The valid format is an alphanumeric string, with a maximum of 256 characters. Only available for WebSphere Extreme Scale 7.1.

WebSphere Server SubNode If the server is also monitored by ITCAM Agent for WebSphere Applications, and is represented by a node in Tivoli Enterprise Portal, this field contains the agent subnode name for this server. Using this value, you can link from Extreme Scale workspaces directly into agent workspaces for the server. The valid format is an alphanumeric string, with a maximum of 32 characters.

Heap Used Percent The percentage of used JVM memory. The valid format is a decimal (formatted to one decimal place).

Connection Status The agent status for the Catalog Service connection. The valid values are `ONLINE` and `OFFLINE`.

Is Leader Whether the server is the leader in a core group. The valid values are `YES` or `NO`.

Stats Level The level of the statistics. The valid values are:

- `SERVER`: metrics for a single server.
- `COREGROUP`: aggregated metrics for servers in a core group.
- `ZONE`: aggregated metrics for servers in a zone.

Hung Threads Blocked Number of hung threads detected in the BLOCKED state. The valid format is a positive integer.

Hung Threads Blocked Number of hung threads detected in the WAITING state. The valid format is a positive integer.

Hung Threads Blocked Number of hung threads detected in the TIMED_WAITING state. The valid format is a positive integer.

Hung Threads Total Total number of hung threads detected on the server or several servers. The valid format is a positive integer.

Extreme Scale Grids attributes

The **Extreme Scale Grids** attributes provide common statistics for a grid instance running on a virtual machine process, or a shard or map set within this grid, or aggregated statistics across all grids in a container. These statistics can also be aggregated from several servers.

The attributes within this group are used to build the "WebSphere Extreme Scale Zone Summary workspace" on page 337, "WebSphere Extreme Scale Zone workspace" on page 337 "Selected Containers workspace" on page 339 "Transactions workspace" on page 341, "Transactions – Selected Level workspace" on page 342 "Transactions – Selected Partition workspace" on page 345

Origin Node The server name subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Sample Date and Time The date and time at which the agent has collected this data. The valid format is a 16-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 72. Format of the 16-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Interval Time The length of the sample interval in seconds. The valid format is a positive integer.

Statistics Level The level at which statistics are aggregated in the table. The valid values are:

- `SHARD`: raw statistics for an individual shard
- `PARTITION`: summary across all shards in a partition. Not used in the current version.
- `MAP`: summary across all partitions within a map.
- `MAPSET`: summary across all partitions within a map set.
- `GRID`: summary across all map sets within a Grid.
- `DOMAIN`: summary across all Grid Containers within a Grid Domain,

Scope Level The servers from which the statistic information is collected for the table. The valid values are:

- `SHARD`: statistics from a single shard, on one server
- `CONTAINER`: statistics from one container
- `SERVER`: statistics from one server
- `COREGROUP`: statistics from servers within a core group
- `ZONE`: statistics from servers within a zone

Grid Name The grid name. The valid format is an alphanumeric string, with a maximum of 32 characters.

Server Name The server name. The valid format is an alphanumeric string, with a maximum of 48 characters.

Core Group Name The core group name. The valid format is an alphanumeric string, with a maximum of 32 characters.

Statistics Name The name of the unit for which the information is aggregated in this row. For example, if the information is aggregated for a zone, this is the zone name. If the information is aggregated for a map set, this is the map set name, and so on. The valid format is an alphanumeric string, with a maximum of 48 characters.

Statistics ID The unique identifier for this statistics row. Used for identifying the statistic that triggers a situation. The valid format is an alphanumeric string, with a maximum of 96 characters.

Partition ID The partition ID for this Grid Shard, collected for SHARD aggregation level only. The valid format is a positive integer.

Summary Level The aggregation level and scope for this row. This field determines the values of the **Statistics Level** and **Statistics Scope** fields. The valid values are:

- `SHARD`: raw statistics for an individual shard. Level is `SHARD`, Scope is `SHARD`.
- `PARTITION`: aggregated information for all shards in a partition. Level is `PARTITION`, Scope is `ZONE`
- `MAP`: aggregated information for a map, on all servers within a zone. Level is `MAPSET`, Scope is `ZONE`.
- `MAPSET`: aggregated information for a map set, on all servers within a zone. Level is `MAPSET`, Scope is `ZONE`.
- `GRID`: aggregated information for a grid, on all servers within a zone. Level is `GRID`, Scope is `ZONE`.
- `DOMAIN`: aggregated information for a domain, on all servers within a zone. Level is `DOMAIN`, Scope is `ZONE`.
- `MAP_SRV`: aggregated information for a map, on a single server. Level is `MAP`, Scope is `SERVER`.
- `MAPSET_SRV`: aggregated information for a map set, on a single server. Level is `MAPSET`, Scope is `SERVER`.
- `GRID_SRV`: aggregated information for a grid, on a single server. Level is `GRID`, Scope is `SERVER`.
- `DOMAIN_SRV`: aggregated information for a domain, on a single server. Level is `DOMAIN`, Scope is `SERVER`.
- `MAP_CG`: aggregated information for a map, on all servers within a core group. Level is `MAP`, Scope is `COREGROUP`.
- `MAPSET_CG`: aggregated information for a map set, on all servers within a core group. Level is `MAPSET`, Scope is `COREGROUP`.
- `GRID_CG`: aggregated information for a grid, on all servers within a core group. Level is `GRID`, Scope is `COREGROUP`.
- `DOMAIN_CG`: aggregated information for a domain, on all servers within a core group. Level is `DOMAIN`, Scope is `COREGROUP`.

MapSet Name The map set name. The valid format is an alphanumeric string, with a maximum of 32 characters.

Domain Name The domain name for the grid instance within the server JVM. The valid format is an alphanumeric string, with a maximum of 32 characters. Only available for WebSphere Extreme Scale 7.1.

Important: Some name fields might be set to `[Summary]` at various aggregation levels. For example, **Server Name** is `[Summary]` if information is aggregated from multiple servers.

Transaction Count The number of transactions processed by the Grid Shard or all Shards during the collection interval. The valid format is a positive integer.

Transaction Time The total transaction processing time spent by the Grid Shard or all Shards during the collection interval. The valid format is a positive integer.

Transaction Rate The average rate, per second, at which the Grid Shard or all Shards were processing transactions during the collection interval. The valid format is a decimal (formatted to three decimal places).

Extreme Scale Map attributes

The **Extreme Scale Map** attributes provide statistics for a particular map running within a grid container, or aggregated statistics for several maps. A map runs on a particular server, within a grid and a map set; it is associated with one or several partitions on the server.

The attributes within this group are used to build the “WebSphere Extreme Scale Zone Summary workspace” on page 337,“WebSphere Extreme Scale Zone workspace” on page 337“Maps workspace” on page 346“Maps – Selected Level workspace” on page 347 and “Maps – Selected Partition workspace” on page 349.

Origin Node The server name subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Sample Date and Time The date and time at which the agent has collected data. The valid format is a 16-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 73. Format of the 16-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Interval Time Indicates the length of the sample interval in seconds. The valid format is a positive integer.

Statistics Level The level at which statistics are aggregated in the table. The valid values are:

- SHARD: raw statistics for an individual shard
- PARTITION: summary across all shards in a partition. Not used in the current version.
- MAP: summary across all partitions within a map.
- MAPSET: summary across all partitions within a map set.
- GRID: summary across all map sets within a Grid.
- DOMAIN: summary across all Grid Containers within a Grid Domain,

Scope Level The servers from which the statistic information is collected for the table. The valid values are:

- SHARD: statistics from a single shard, on one server
- CONTAINER: statistics from one container
- SERVER: statistics from one server
- COREGROUP: statistics from servers within a core group
- ZONE: statistics from servers within a zone

Grid Name The grid name. The valid format is an alphanumeric string, with a maximum of 32 characters.

Server Name The server name. The valid format is an alphanumeric string, with a maximum of 48 characters.

Core Group Name The core group name. The valid format is an alphanumeric string, with a maximum of 32 characters.

Statistics Name The name of the unit for which the information is aggregated in this row. For example, if the information is aggregated for a zone, this is the zone name; if the information is for an individual map, this is the map name, and so on. The valid format is an alphanumeric string, with a maximum of 48 characters.

Statistics ID The unique identifier for this statistics row. Used for identifying the statistic that triggers a situation. The valid format is an alphanumeric string, with a maximum of 96 characters.

Partition ID The partition ID for this Grid Shard, collected for SHARD aggregation level only. The valid format is a positive integer.

Summary Level The aggregation level and scope for this row. This field determines the values of the **Statistics Level** and **Statistics Scope** fields. The valid values are:

- SHARD: raw statistics for an individual shard. Level is SHARD, Scope is SHARD.
- PARTITION: aggregated information for all shards in a partition. Level is PARTITION, Scope is ZONE
- MAP: aggregated information for a map, on all servers within a zone. Level is MAPSET, Scope is ZONE.
- MAPSET: aggregated information for a map set, on all servers within a zone. Level is MAPSET, Scope is ZONE.
- GRID: aggregated information for a grid, on all servers within a zone. Level is GRID, Scope is ZONE.

- DOMAIN: aggregated information for a domain, on all servers within a zone. Level is DOMAIN, Scope is ZONE.
- MAP_SRV: aggregated information for a map, on a single server. Level is MAP, Scope is SERVER.
- MAPSET_SRV: aggregated information for a map set, on a single server. Level is MAPSET, Scope is SERVER.
- GRID_SRV: aggregated information for a grid, on a single server. Level is GRID, Scope is SERVER.
- DOMAIN_SRV: aggregated information for a domain, on a single server. Level is DOMAIN, Scope is SERVER.
- MAP_CG: aggregated information for a map, on all servers within a core group. Level is MAP, Scope is COREGROUP.
- MAPSET_CG: aggregated information for a map set, on all servers within a core group. Level is MAPSET, Scope is COREGROUP.
- GRID_CG: aggregated information for a grid, on all servers within a core group. Level is GRID, Scope is COREGROUP.
- DOMAIN_CG: aggregated information for a domain, on all servers within a core group. Level is DOMAIN, Scope is COREGROUP.

Map Name The map name. The valid format is an alphanumeric string, with a maximum of 32 characters.

Important: Some name fields can be set to [Summary] at various aggregation levels. For example, **Server Name** is [Summary] if information is aggregated from multiple servers.

Map Count The number of the map entries held in this Grid Partition. The valid format is a positive integer.

Get Count The number of maps gets registered on the collection interval. The valid format is a positive integer. The Get Count attribute is only supported for WebSphere Extreme Scale 7.1. Ignore this attribute value for WebSphere Extreme Scale 6.1 and 7.0; it does not reflect the actual hit count and is only used for internal calculations.

Hit Count The number of map hits registered on the collection interval. The valid format is a positive integer. The Hit Count attribute is only supported for WebSphere Extreme Scale 7.1. Ignore this attribute value for WebSphere Extreme Scale 6.1 and 7.0; it does not reflect the actual get count and is only used for internal calculations.

Hit Rate The map hit rate percentage registered on the collection interval. -1 when **Get Count** is 0. The valid format is a positive integer.

Used KBytes The memory, in kilobytes, used by all entries in the map. The valid format is a positive integer. This information is not available for WebSphere Extreme Scale 6.1 and 7.0; for these versions, the value is always -1.

Batch Update Total Time The total time, in seconds, spent on batch database updates for the Map during the collection interval. The valid format is a positive integer.

Extreme Scale Shards attributes

The **Extreme Scale Shards** attributes provide statistics for a particular shard running within a grid container, or aggregated statistics for several shards. A shard runs on a particular server. A shard belongs to a grid and a map set. A shard corresponds to a partition. One partition can contain several shards on different servers, but only one shard can belong to a partition on any given server.

The attributes within this group are used to build the “Shards workspace” on page 350,“Shards – Selected Level workspace” on page 351 and “Shards – Selected Partition workspace” on page 354.

Origin Node The server name subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Sample Date and Time The date and time at which the agent has collected data. The valid format is a 16-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 74. Format of the 16-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Interval Time Indicates the length of the sample interval in seconds. The valid format is a positive integer.

Server Name The server name. The valid format is an alphanumeric string, with a maximum of 48 characters.

Grid Name The grid name. The valid format is an alphanumeric string, with a maximum of 32 characters.

Core Group Name The core group name. The valid format is an alphanumeric string, with a maximum of 32 characters.

MapSet Name The map set name. The valid format is an alphanumeric string, with a maximum of 32 characters.

Domain Name The domain name for the grid instance within the server JVM. The valid format is an alphanumeric string, with a maximum of 32 characters. Only available for WebSphere Extreme Scale 7.1.

Container Name The name of this Grid Container. The valid format is an alphanumeric string, with a maximum of 32 characters.

Important: Some name fields might be set to `[Summary]` at various aggregation levels. For example, **Server Name** is `[Summary]` if information is aggregated from multiple servers.

Statistics Name The name of the unit for which the information is aggregated in this row. For example, if the information is aggregated for a zone, this is the zone name; if the information is for an individual shard, this is the shard name, and so on. The valid format is an alphanumeric string, with a maximum of 48 characters.

Display name The unique identifier for this statistics row. Used for identifying the statistic that triggers a situation. The valid format is an alphanumeric string, with a maximum of 96 characters.

State The state of the shard, as reported by WebSphere Extreme Scale. The valid format is an alphanumeric string, with a maximum of 32 characters.

Partition The partition ID for this Grid Shard, collected for SHARD aggregation level only. The valid format is a positive integer.

Active Request Count The number of requests currently being processed by this shard. The valid format is a positive integer.

Request Count The total number of requests that this shard has processed or forwarded on the collection interval. The valid format is a positive integer.

Forwarded Request Count The number of requests that this shard has forwarded on the collection interval. The valid format is a positive integer.

Processed Request Count The number of requests that this shard has processed or forwarded on the collection interval. The valid format is a positive integer.

Request Rate The overall request processing rate for this shard, including both processed and forwarded requests, during the collection interval. The valid format is a decimal (formatted to three decimal places).

Forwarded Request Rate The rate of processing forwarded requests for this shard during the collection interval. The valid format is a decimal (formatted to three decimal places).

Processed Request Rate The rate of processing non-forwarded (processed) requests for this shard during the collection interval. The valid format is a decimal (formatted to three decimal places).

Type The type of the shard. The valid values are:

- `PRIMARY`: This is a primary shard in the partition.
- `INACTIVE`: This shard is currently inactive within the partition.
- `SYNC_REPLICA`: This shard is currently a replica within the partition and is synchronized with the primary shard.
- `ASYNC_REPLICA`: This shard is currently a replica within the partition and is not synchronized with the primary shard.

Statistics Level The level at which statistics are aggregated in the table. The valid values are:

- `SHARD`: raw statistics for an individual shard
- `PARTITION`: summary across all shards in a partition. Not used in the current version.
- `MAP`: summary across all partitions within a map.
- `MAPSET`: summary across all partitions within a map set.

- GRID: summary across all map sets within a Grid.
- DOMAIN: summary across all Grid Containers within a Grid Domain,

Scope Level The servers from which the statistic information is collected for the table. The valid values are:

- SHARD: statistics from a single shard, on one server
- CONTAINER: statistics from one container
- SERVER: statistics from one server
- COREGROUP: statistics from servers within a core group
- ZONE: statistics from servers within a zone

Summary Level The aggregation level and scope for this row. This field determines the values of the **Statistics Level** and **Statistics Scope** fields. The valid values are:

- SHARD: raw statistics for an individual shard. Level is SHARD, Scope is SHARD.
- PARTITION: aggregated information for all shards in a partition. Level is PARTITION, Scope is ZONE
- MAP: aggregated information for a map, on all servers within a zone. Level is MAPSET, Scope is ZONE.
- MAPSET: aggregated information for a map set, on all servers within a zone. Level is MAPSET, Scope is ZONE.
- GRID: aggregated information for a grid, on all servers within a zone. Level is GRID, Scope is ZONE.
- DOMAIN: aggregated information for a domain, on all servers within a zone. Level is DOMAIN, Scope is ZONE.
- MAP_SRV: aggregated information for a map, on a single server. Level is MAP, Scope is SERVER.
- MAPSET_SRV: aggregated information for a map set, on a single server. Level is MAPSET, Scope is SERVER.
- GRID_SRV: aggregated information for a grid, on a single server. Level is GRID, Scope is SERVER.
- DOMAIN_SRV: aggregated information for a domain, on a single server. Level is DOMAIN, Scope is SERVER.
- MAP_CG: aggregated information for a map, on all servers within a core group. Level is MAP, Scope is COREGROUP.
- MAPSET_CG: aggregated information for a map set, on all servers within a core group. Level is MAPSET, Scope is COREGROUP.
- GRID_CG: aggregated information for a grid, on all servers within a core group. Level is GRID, Scope is COREGROUP.
- DOMAIN_CG: aggregated information for a domain, on all servers within a core group. Level is DOMAIN, Scope is COREGROUP.

Extreme Scale Placements attributes

The **Extreme Scale Placements** attributes provide information about grids and their placement in the WebSphere Extreme Scale zone.

The attributes within this group are used to build the “Grids workspace” on page 340.

Origin Node The server name subnode. The valid format is an alphanumeric string, with a maximum of 32 characters.

Sample Date and Time The date and time at which the agent has collected this data. The valid format is a 16-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 75. Format of the 16-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Interval Time The length of the sample interval in seconds. The valid format is a positive integer.

Grid Name The name of the grid. The valid format is an alphanumeric string, with a maximum of 32 characters.

MapSet Name The name of the map set. The valid format is an alphanumeric string, with a maximum of 32 characters.

Placement Strategy The Grid shards placement strategy. The valid values are `PER_CONTAINER` and `FIXED_PARTITIONS`.

Min Sync Replicas The minimum amount of synchronous replicas in the grid. The valid format is a positive integer.

Development Mode The Grid development mode status. The valid format is a positive integer.

Number of Containers The number of containers in the grid. The valid format is a positive integer.

Number of Machines The number of machines in the grid. The valid format is a positive integer.

Outstanding Work Items The number of Outstanding Work Items in the grid. The valid format is a positive integer.

Number of Active Zones The number of Active Zones in the grid. The valid format is a positive integer.

Extreme Scale Thread Pools attributes

The **Extreme Scale Thread Pools** attributes provide information about thread pools on servers within the WebSphere Extreme Scale zone.

The attributes within this group are used to build the “Containers workspace” on page 338 and “Selected Containers workspace” on page 339.

All attributes in this group are only available for WebSphere Extreme Scale 7.1.

Origin Node The server name subnode. The valid format is an alphanumeric string, with a maximum of 32 characters.

Sample Date and Time The date and time at which the agent has collected this data. The valid format is a 16-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 76. Format of the 16-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Interval Time The length of the sample interval in seconds. The valid format is a positive integer.

Thread Pool Name The name of the thread pool. The valid format is an alphanumeric string, with a maximum of 32 characters.

Server Name The name of the server. The valid format is an alphanumeric string, with a maximum of 48 characters.

Core Group The name of core group. The valid format is an alphanumeric string, with a maximum of 32 characters.

Maximum Size The maximum pool size. The valid format is a positive integer. Only available for WebSphere Extreme Scale 7.1.

Minimum Size The minimum pool size. The valid format is a positive integer. Only available for WebSphere Extreme Scale 7.1.

Active Thread Count The active thread count. The valid format is a positive integer. Only available for WebSphere Extreme Scale 7.1.

Stats Level The level at which statistics are aggregated in the table. The valid values are:

- SERVER: information for thread pools on a single server.
- COREGROUP: aggregated information for thread pools on servers within a core group.
- ZONE: aggregated information for thread pools on servers within a zone.

WebSphere XS Configuration attributes

The WebSphere XS Configuration attributes provide data access for WXS cell configuration workspaces.

Origin Node The XD Cell subnode. The valid format is an alphanumeric string, with a maximum of 32 characters.

Sample Date and Time The date and time at which the agent collected data. The valid format is T.

Interval Time The length of the sample interval in seconds. The valid format is a 4-byte integer. Valid fixed values are: =-1

Row Id The row identifier. The valid format is a 2-byte integer.

View Id The view identifier. The valid format is a 2-byte integer.

Act Id The act identifier. The valid format is a 2-byte integer.

Data The data string. The valid format is an alphanumeric string, with a maximum of 4096 characters.

Situations for WebSphere Extreme Scale

Some predefined situations are available for WebSphere Extreme Scale monitoring. You can use them to monitor quorum status and detect the stopping of a catalog server.

These predefined situations display an alert status. When these situations trigger an alert, you can investigate the event by opening the corresponding workspace.

How the situations work

Situations are tests expressed in IF-TRUE format of system conditions that you want to monitor; the tested value is an ITCAM Agent for WebSphere Applications attribute expressed in the form *attribute-group.attribute-name*. If the specified condition occurs or exists, the situation is true, and an alert is issued.

Accessing the situations

A number of predefined situations are shipped to monitor WebSphere Extreme Scale. Access the situations in the Tivoli Enterprise Portal using one of the following methods:

- From the toolbar on the main menu, click the Situation Editor icon  and scroll to the situation that you want to view.
- Right-click a WebSphere Extreme Scale zone node. Click **Manage Situations** to display all the situations available for the zone. If you want to start, stop edit or model a situation right-click the situation and select the option you want.

WXSQuorumWaiting is a critical situation. It is raised when a Grid within the monitored zone or zones is waiting for the quorum.

WXSCatalogOffline is a critical situation. It is raised when a catalog server within the monitored zone or zones goes offline.

WXSContainerOffline is a critical situation. It is raised when a container server within the monitored zone or zones goes offline.

WXSHighUsedMemoryPercent is a critical situation. It is raised when the used heap memory goes over 80% of the maximum on a container server within the monitored zone or zones.

WXSHungThreadsDetected is a critical situation. It is raised when the used hung threads are detected on a container server within the monitored zone or zones.

WebSphere Extreme Scale Take Action Commands

Use Take Action commands to manage Extreme Scale zone nodes, to trigger zone topology discovery, to override the quorum on the Extreme Scale catalog service, to shut down servers in the Extreme Scale grid, and to trigger map set placement in the grid.

WXS_Add_Zone: add a zone node

Use the WXS_Add_Zone Take Action command, available on the Agent for WebSphere Applications node level, to add a new WebSphere Extreme Scale zone node for this server.

Command syntax

YN:WXS_Add_Zone *Node_Name*

Parameters:

Node_Name
The name of the new zone node

Important: A newly created node contains no data. To monitor a WebSphere Extreme Scale zone or several zones, configure the node. To do this, right-click the node and select **WebSphere XS Zone – Configuration**. See "WebSphere Extreme Scale configuration workspace" on page 334.

WXS_Rename_Zone: rename a zone node

Use the WXS_Rename_Zone Take Action command, available on the WebSphere Extreme Scale zone node level, to change the name of the zone node in the navigator.

Attention: When you rename a zone node, Tivoli Monitoring loses all history information for it.

Command syntax

YN:WXS_Rename_Zone *New_Node_Name*

Parameters:

New_Node_Name
The new name of the zone node.

Important: The node with the old name is disabled. Use the **Clear Offline Nodes** command in Tivoli Enterprise Portal to remove the inactive zone from the tree.

WXS_Remove_Zone: remove a zone node

Use the WXS_Remove_Zone Take Action command, available on the WebSphere Extreme Scale zone node level, to remove a zone node.

Command syntax

YN:WXS_Remove_Zone

Important: The zone is disabled. Use the **Clear Offline Nodes** command in Tivoli Enterprise Portal to remove the inactive zone from the tree.

WXS_Remove_Offline: remove a catalog or container in the offline state from monitoring

Use the WXS_Remove_Offline Take Action command, available on the WebSphere Extreme Scale zone node level, to stop monitoring a catalog or container (server) that is now offline. If you do not use this Take Action command, the offline catalog or container remains in the monitoring tables for a while. It is listed in workspaces and might trigger false events.

Command syntax

YN:WXS_Remove_Offline *Server_Name*

Parameters:

Server_Name
The name of the server to remove.

WXS_Discover_Zone: discover the zone topology

Use the WXS_Discover_Zone Take Action command, available on the WebSphere Extreme Scale zone node level, to discover the topology of the monitored zone. This action updates monitoring of the zone to the new topology.

Zone topology is discovered automatically once in the Discovery interval (set in the "WebSphere Extreme Scale configuration workspace" on page 334). If container servers or catalog services were added, removed, or restarted, you can use this Take Action command to update monitoring to the new topology without waiting for expiration of the Discovery interval.

Command syntax

YN:WXS_Discover_Zone

WXS_Override_Quorum: override quorum for the catalog server

Use the WXS_Override_Quorum Take Action command, available on the WebSphere Extreme Scale zone node level, to override quorum on the monitored zone.

To perform this action, the agent uses the OverrideQuorum method on the primary catalog server.

Command syntax

YN:WXS_Override_Quorum

WXS_Tear_Down_Servers: stop Extreme Scale container server

Use the WXS_Tear_Down_Servers Take Action command to stop an Extreme Scale container server. This command is available on the WebSphere Extreme Scale zone node, or in the Container Servers Summary table (Containers workspace).

To perform this action, the agent uses the tearDownServers method on PlacementServiceMBean.

When the action is invoked from the Container Servers Summary table (“Containers workspace” on page 338), the server name is taken from the selected row.

Command syntax

YN:WXS_Tear_Down_Servers *Server_Name*

Parameters:

Server_Name
The name of the server to stop.

WXS_Trigger_Placement: trigger the placement of a map set on an Extreme Scale grid

Use the WXS_Trigger_Placement Take Action command to trigger the placement of a map set on an Extreme Scale grid. By default, a grid be placed automatically, but you can use this command to start its placement earlier. This command is available on the WebSphere Extreme Scale zone node, or in the Grids Summary table (Grids workspace).

To perform this action, the agent uses the triggerPlacement method on PlacementServiceMBean.

When the action is invoked from the Grids Summary table (“Grids workspace” on page 340), the grid and map set names are taken from the selected row.

Command syntax

YN:WXS_Trigger_Placement *Grid_Name MapSet_Name*

Parameters:

Grid_Name
The name of the grid.

MapSet_Name
The name of the map set. The agent triggers placement of this map set on the grid.

WebSphere PMI Attribute Mapping

The following tables show how the data displayed in the ITCAM for Application Diagnostics resource workspaces map to their corresponding WebSphere PMI categories and their attributes. It also provides the monitoring overhead incurred when turning on these attributes.

By default, ITCAM changes the PMI collection level based on its monitoring level. See the *Advanced configuration of the Agent* chapter of *ITCAM Agent for WebSphere Applications Installation and Configuration Guide* to learn more about this behavior and how to turn it off for custom monitoring.

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping.

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

AppServer--High Availability Manager	ITM Table Name: KYNHAMGMT			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: HAManager			
Local Groups	LocalGroupCount	LocalGroupCount	All	High
Group State Rebuild Time	GroupStateRebuildTime	GroupStateRebuildTime	All	High
Bulletin-Board Subjects	BulletinBoardSubjectCount	BulletinBoardSubjectCount	All	High
Bulletin-Board Subscriptions	BulletinBoardSubcriptionCount	BulletinBoardSubcriptionCount	All	High
Bulletin-Board Rebuild Time	BulletinBoardRebuildTime	BulletinBoardRebuildTime	All	High
Local Bulletin-Board Subjects	LocalBulletinBoardSubjectCount	LocalBulletinBoardSubjectCount	All	High
AppServer-DCS Stacks	**ITM Table Name: KYNDCSSTK**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: DCS Statistics			
Message Buffer Reallocations	MessageBufferReallocationCount	MessageBufferReallocationCount	All	Medium
Sent Messages	SentMessageCount	SentMessageCount	All	High
Average Outgoing Message Size	OutgoingMessageSize	OutgoingMessageSize	All	High
Minimum Outgoing Message Size	OutgoingMessageSize	OutgoingMessageSize	All	High
Maximum Outgoing Message Size	OutgoingMessageSize	OutgoingMessageSize	All	High
Outgoing Messages	SentMessageCount	SentMessageCount	All	High
Average Incoming Message Size	IncomingMessageSize	IncomingMessageSize	All	High
Minimum Incoming Message Size	IncomingMessageSize	IncomingMessageSize	All	High
Maximum Incoming Message Size	IncomingMessageSize	IncomingMessageSize	All	High
Incoming Messages	ReceivedMessageCount	ReceivedMessageCount	All	High
Synchronization Completion Time	SynchronizationCompleteTime	SynchronizationCompleteTime	All	High
Synchronization Timeouts	SynchronizationTimeoutCount	SynchronizationTimeoutCount	All	Medium
High Severity Congestion Events	HighSeverityCongestionEventCount	HighSeverityCongestionEventCount	All	Medium
Coalesce Time	CoalesceTime	CoalesceTime	All	Medium
Join View Change Time	JoinViewChangeTime	JoinViewChangeTime	All	High
Remove View Change Time	RemoveViewChangeTime	RemoveViewChangeTime	All	High

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping (continued).

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

Suspicions	SuspicionCount	SuspicionCount	All	High
View Changes	ViewChangeCount	ViewChangeCount	All	Medium
Group Size	ViewGroupSize	ViewGroupSize	All	Medium
Web Applications	**ITM Table Name: KYNAPP**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: Web Applications			
Request Count	RequestCount (Servlet Info)	RequestCount (Servlet Info)	Basic	Low
Request Rate (per sec)	RequestCount	RequestCount	Basic	Low
Error Count	ErrorCount (Servlet Info)	ErrorCount (Servlet Info)	Extended	Low
Error Rate (per sec)	ErrorCount (Servlet Info)	ErrorCount (Servlet Info)	Extended	Low
Average Response Time (ms)	ServiceTime (Servlet Info)	ServiceTime (Servlet Info)	Basic	Medium
Average Concurrent Requests	ConcurrentRequests (Servlet Info)	ConcurrentRequests (Servlet Info)	Extended	High
Servlets Loaded	LoadedServletCount	LoadedServletCount	All	Low
Servlets Reloaded	ReloadCount	ReloadCount	All	Low
WebApplications --ServletSessions	**ITM Table Name: KYNSERVS**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: Servlet Session Manager			
Sessions Created	CreateCount	CreateCount	All	Low
Session Creation Rate (per sec)	CreateCount	CreateCount	All	Low
Sessions Invalidated	InvalidateCount	InvalidateCount	All	Low
Session Invalidation Rate (per sec)	InvalidateCount	InvalidateCount	All	Low
Average Session Lifetime (ms)	LifeTime	LifeTime	Extended	Medium
Average Concurrently Active Sessions	ActiveCount	ActiveCount	All	High
Average Concurrently Live Sessions	LiveCount	LiveCount	Basic	High
Failed Session Requests	NoRoomForNewSessionCount	NoRoomForNewSessionCount	Extended	Low
Failed Session Request Rate (per sec)	NoRoomForNewSessionCount	NoRoomForNewSessionCount	Extended	Low
Cache Discards	CacheDiscardCount	CacheDiscardCount	All	Low
Cache Discard Rate (per sec)	CacheDiscardCount	CacheDiscardCount	All	Low
External Read Time (ms)	ExternalReadTime	ExternalReadTime	Extended	Medium
External Read Size (bytes)	ExternalReadSize	ExternalReadSize	Extended	Medium

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping (continued).

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

External Write Time (ms)	ExternalWriteTime	ExternalWriteTime	Extended	Medium
External Write Size (bytes)	ExternalWriteSize	ExternalWriteSize	Extended	Medium
Broken Session Affinities	AffinityBreakCount	AffinityBreakCount	All	Low
Broken Session Affinity Rate (per sec)	AffinityBreakCount	AffinityBreakCount	All	Low
Time since Last Activated	TimeSinceLastActivated	TimeSinceLastActivated	All	Medium
Nonexistent Session Requests	ActivateNonExistSessionCount	ActivateNonExistSessionCount	All	Low
Nonexistent Session Request Rate (per sec)	ActivateNonExistSessionCount	ActivateNonExistSessionCount	All	Low
Total Serializable Session Object Size (bytes)	SessionObjectSize	SessionObjectSize	All	Max
Average Serializable Session Object Size (bytes)	SessionObjectSize	SessionObjectSize	All	Max
Min Serializable Session Object Size (bytes)	SessionObjectSize	SessionObjectSize	All	Max
Max Serializable Session Object Size (bytes)	SessionObjectSize	SessionObjectSize	All	Max
EJB Containers	**ITM Table Name: KYNCONTNR**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: Enterprise Beans			
Method Average Response Time (ms)	MethodResponseTime	MethodResponseTime	Basic	High
Method Invocation Count	MethodCallCount	MethodCallCount	Basic	High
Method Invocation Rate (per sec)	MethodCallCount	MethodCallCount	Basic	High
Create Average Time (ms)	CreateTime	CreateTime	All	Max
Remove Average Time (ms)	RemoveTime	RemoveTime	All	Max
Average Concurrently Ready Beans	ReadyCount	ReadyCount	Basic	Low
Average Concurrently Live Beans	LiveCount	LiveCount	Extended	High
Active Method Count	ActiveMethodCount	ActiveMethodCount	All	High
Create Count	CreateCount	CreateCount	Basic	Low
Creation Rate (per sec)	CreateCount	CreateCount	Basic	Low
Remove Count	RemoveCount	RemoveCount	Basic	Low
Removal Rate per sec)	RemoveCount	RemoveCount	Basic	Low
Activate Count	ActivateCount	ActivateCount	All	Low

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping (continued).

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

Activation Rate (per sec)	ActivateCount	ActivateCount	All	Low
Passivate Count	PassivateCount	PassivateCount	Basic	Low
Passivation Rate (per sec)	PassivateCount	PassivateCount	Basic	Low
Entity Bean Load Count	LoadCount	LoadCount	All	Low
Entity Bean Load Rate (per sec)	LoadCount	LoadCount	All	Low
Entity Bean Store Count	StoreCount	StoreCount	All	Low
Entity Bean Store Rate (per sec)	StoreCount	StoreCount	All	Low
Instantiate Count	InstantiateCount	InstantiateCount	All	Low
Instantiation Rate (per sec)	InstantiateCount	InstantiateCount	All	Low
Destroy Count	FreedCount	FreedCount	All	Low
Destruction Rate (per sec)	FreedCount	FreedCount	All	Low
EJB Containers ---Enterprise Java Beans	**ITM Table Name: KYNEJB**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: Enterprise Beans			
Method Invocations	MethodCallCount	MethodCallCount	Basic	High
Method Invocation Rate (per sec)	MethodCallCount	MethodCallCount	Basic	High
Method Average Response Time (ms)	MethodResponseTime	MethodResponseTime	Basic	High
Create Count	CreateCount	CreateCount	Basic	Low
Creation Rate (per sec)	CreateCount	CreateCount	Basic	Low
Create Average Time (ms)	CreateTime	CreateTime	All	Max
Remove Count	RemoveCount	RemoveCount	Basic	Low
Removal Rate (per sec)	RemoveCount	RemoveCount	Basic	Low
Remove Average Time (ms)	RemoveTime	RemoveTime	All	Max
Activate Count	ActivateCount	ActivateCount	All	Low
Activation Rate (per sec)	ActivateCount	ActivateCount	All	Low
Passivate Count	PassivateCount	PassivateCount	All	Low
Passivation Rate	PassivateCount	PassivateCount	All	Low
Entity Bean Load Count	LoadCount	LoadCount	All	Low
Entity Bean Load Rate (per sec)	LoadCount	LoadCount	All	Low
Entity Bean Store Count	StoreCount	StoreCount	All	Low
Entity Bean Store Rate (per sec)	StoreCount	StoreCount	All	Low

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping (continued).

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

Instantiate Count	InstantiateCount	InstantiateCount	All	Low
Destroy Count	FreedCount	FreedCount	All	Low
Destruction Rate (per sec)	FreedCount	FreedCount	All	Low
Find Count	RetrieveFromPoolSuccessCount	RetrieveFromPoolSuccessCount	All	Low
Find Rate (per sec)	RetrieveFromPoolSuccessCount	RetrieveFromPoolSuccessCount	All	Low
Get Count	RetrieveFromPoolCount	RetrieveFromPoolCount	All	Low
Get Rate (per sec)	RetrieveFromPoolCount	RetrieveFromPoolCount	All	Low
Return Count	ReturnsToPoolCount	ReturnsToPoolCount	Extended	Low
Return Rate (per sec)	ReturnsToPoolCount	ReturnsToPoolCount	Extended	Low
Discard Count	ReturnsDiscardCount	ReturnsDiscardCount	Extended	Low
Discard Rate (per sec)	ReturnsDiscardCount	ReturnsDiscardCount	Extended	Low
Drain Count	DrainsFromPoolCount	DrainsFromPoolCount	All	Low
Drain Rate (per sec)	DrainsFromPoolCount	DrainsFromPoolCount	All	Low
Average Concurrently Ready Beans	ReadyCount	ReadyCount	Basic	High
Average Concurrently Live Beans	LiveCount	LiveCount	Extended	High
Active Method Count	ActiveMethodCount	ActiveMethodCount	All	High
Average Objects Discarded	DrainSize	DrainSize	All	Medium
Average Objects in Pool	PooledCount	PooledCount	Basic	High
EJB Containers ---Container Transactions	**ITM Table Name: KYNTRANS**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: Transaction Manager			
Global Transactions Begun	GlobalBegunCount	GlobalBegunCount	Extended	Low
Global Transactions Begin Rate (per sec)	GlobalBegunCount	GlobalBegunCount	Extended	Low
Local Transactions Begun	LocalBegunCount	LocalBegunCount	Extended	Low
Local Transactions Begin Rate (per sec)	LocalBegunCount	LocalBegunCount	Extended	Low
Global Transactions Active	ActiveCount	ActiveCount	Basic	Low
Local Transactions Active	LocalActiveCount	LocalActiveCount	All	Low
Global Transactions Committed	CommittedCount	CommittedCount	Basic	Low
Global Transaction Commit Rate (per sec)	CommittedCount	CommittedCount	Basic	Low
Local Transactions Committed	LocalCommittedCount	LocalCommittedCount	All	Low
Local Transaction Commit Rate (per sec)	LocalCommittedCount	LocalCommittedCount	All	Low

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping (continued).

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

Global Transactions Rolled Back	RolledbackCount	RolledbackCount	Basic	Low
Global Transaction Rollback Rate (per sec)	RolledbackCount	RolledbackCount	Basic	Low
Local Transactions Rolled Back	LocalRolledbackCount	LocalRolledbackCount	All	Low
Local Transaction Rollback Rate (per sec)	LocalRolledbackCount	LocalRolledbackCount	All	Low
Global Transaction Timeouts	GlobalTimeoutCount	GlobalTimeoutCount	Extended	Low
Global Transaction Timeout Rate (per sec)	GlobalTimeoutCount	GlobalTimeoutCount	Extended	Low
Local Transaction Timeouts	LocalTimeoutCount	LocalTimeoutCount	Extended	Low
Local Transaction Timeout Rate (per sec)	LocalTimeoutCount	LocalTimeoutCount	Extended	Low
Global Transactions Optimized	OptimizationCount	OptimizationCount	All	Low
Global Transaction Optimize Rate (per sec)	CommittedCount	CommittedCount	Basic	Low
Global Transactions Involved	GlobalInvolvedCount	GlobalInvolvedCount	All	Low
Global Transactions Involve Rate (per sec)	GlobalInvolvedCount	GlobalInvolvedCount	All	Low
Global Transaction Duration (ms)	GlobalTranTime	GlobalTranTime	Extended	Medium
Local Transaction Duration (ms)	LocalTranTime	LocalTranTime	Extended	Medium
Global Transaction before Completion Duration (ms)	GlobalBeforeCompletionTime	GlobalBeforeCompletionTime	All	Medium
Local Transaction before Completion Duration (ms)	LocalBeforeCompletionTime	LocalBeforeCompletionTime	All	Medium
Global Transaction Commit Duration (ms)	GlobalCommitTime	GlobalCommitTime	All	Medium
Local Transaction Commit Duration (ms)	LocalCommitTime	LocalCommitTime	All	Medium
Global Transaction Prepare Duration (ms)	GlobalPrepareTime	GlobalPrepareTime	All	Medium
EJB Containers ---Container Object Pools	**ITM Table Name: KYNCNTROP**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
Average Objects in Pool	PooledCount	PooledCount	Basic	High
Average Objects Discarded	DrainSize	DrainSize	All	Medium
Find Count	RetrieveFromPoolSuccessCount	RetrieveFromPoolSuccessCount	All	Low

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping (continued).

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

Find Rate	RetrieveFromPoolSuccessCount	RetrieveFromPoolSuccessCount	All	Low
Get Count	RetrieveFromPoolCount	RetrieveFromPoolCount	All	Low
Get Rate	RetrieveFromPoolCount	RetrieveFromPoolCount	All	Low
Return Count	ReturnsToPoolCount	ReturnsToPoolCount	Extended	Low
Return Rate	ReturnsToPoolCount	ReturnsToPoolCount	Extended	Low
Discard Count	ReturnsDiscardCount	ReturnsDiscardCount	Extended	Low
Discard Rate	ReturnsDiscardCount	ReturnsDiscardCount	Extended	Low
Drain Count	DrainsFromPoolCount	DrainsFromPoolCount	All	Low
Drain Rate	DrainsFromPoolCount	DrainsFromPoolCount	All	Low
DB Connection Pools	**ITM Table Name: KYNDBCONP**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: JDBC Connection Pools			
Maximum Pool Size	PoolSize	PoolSize	Basic	High
Average Pool Size	PoolSize	PoolSize	Basic	High
Average Waiting Threads	WaitingThreadCount	WaitingThreadCount	Basic	High
Average Wait Time (ms)	WaitTime	WaitTime	Basic	Medium
Average Usage Time (ms)	UseTime	UseTime	Basic	Medium
Average Free Pool Size	FreePoolSize	FreePoolSize	Basic	High
JDBC Time(ms)	JDBCTime	JDBCTime	Extended	Medium
Percent Used	PercentUsed	PercentUsed	Basic	High
Percent of Time Pool at Max	PercentMaxed	PercentMaxed	All	High
Connections Created	CreateCount	CreateCount	Basic	Low
Connection Creation Rate (per sec)	CreateCount	CreateCount	Basic	Low
Connections Allocated	AllocateCount	AllocateCount	Extended	Low
Connection Allocation Rate (per sec)	AllocateCount	AllocateCount	Extended	Low
Connections Destroyed	CloseCount	CloseCount	Basic	Low
Connection Destruction Rate (per sec)	CloseCount	CloseCount	Basic	Low
Threads Timed Out	FaultCount	FaultCount	Extended	Low
Thread Timeout Rate (per sec)	FaultCount	FaultCount	Extended	Low
Prep Statement Cache Discards	PrepStmtCacheDiscardCount	PrepStmtCacheDiscardCount	Extended	Low
Prep Statement Cache Discard Rate (per sec)	PrepStmtCacheDiscardCount	PrepStmtCacheDiscardCount	Extended	Low
Return Count	ReturnCount	ReturnCount	Extended	Low
Return Rate(per sec)	ReturnCount	ReturnCount	Extended	Low

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping (continued).

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

J2C Connection Pools	**ITM Table Name: KYNJ2C**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: J2C Connection Pools			
Maximum Pool Size	PoolSize	PoolSize	Basic	High
Average Pool Size	PoolSize	PoolSize	Basic	High
Average Free Connections	FreePoolSize	FreePoolSize	Basic	High
Connections Used	ManagedConnectionCount	ManagedConnectionCount	All	Low
Connection Handles	ConnectionHandleCount	ConnectionHandleCount	All	Low
Average Wait Time (ms)	WaitTime	WaitTime	Basic	Medium
Concurrent Waiting Threads	WaitingThreadCount	WaitingThreadCount	Basic	High
Average Usage Time (ms)	UseTime	UseTime	Basic	Medium
Pool Used (%)	PercentUsed	PercentUsed	All	High
Percent of Time Pool at Max	PercentMaxed	PercentMaxed	All	High
Connections Created	CreateCount	CreateCount	Basic	Low
Connection Creation Rate (per sec)	CreateCount	CreateCount	Basic	Low
Connections Allocated	AllocateCount	AllocateCount	All	Low
Connection Allocation Rate (per sec)	AllocateCount	AllocateCount	All	Low
Connections Returned	FreedCount	FreedCount	All	Low
Connection Return Rate (per sec)	FreedCount	FreedCount	All	Low
Connections Destroyed	CloseCount	CloseCount	Basic	Low
Connection Destruction Rate (per sec)	CloseCount	CloseCount	Basic	Low
Connection Pool Timeouts	FaultCount	FaultCount	All	Low
Connection Pool Timeout Rate (per sec)	FaultCount	FaultCount	All	Low
Thread Pools	**Table Name: KYNTHRDP**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: Thread Pools			
Maximum Pool Size	PoolSize	PoolSize	Basic	High
Average Pool Size	PoolSize	PoolSize	Basic	High
Average Active Threads	ActiveCount	ActiveCount	Extended	High
Average Free Threads	PoolSize - ActiveCount	PoolSize - ActiveCount	Extended	High
Percent of Time Pool at Max	PercentMaxed	PercentMaxed	All	High
Threads Created	CreateCount	CreateCount	All	Low
Thread Creation Rate (per sec)	CreateCount	CreateCount	All	Low

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping (continued).

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

Threads Destroyed	DestroyCount	DestroyCount	All	Low
Thread Destruction Rate (per sec)	DestroyCount	DestroyCount	All	Low
Thread Pools ---Alarm Manager	**ITM Table Name: KYNALARMM**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: Alarm Manager			
Alarms Cancelled	AlarmsCancelledCount	AlarmsCancelledCount	All	High
Alarms Latency Duration	AlarmLatencyDuration	AlarmLatencyDuration	All	High
Alarms Rate	AlarmRate	AlarmRate	All	High
Alarms Created	AlarmsCreatedCount	AlarmsCreatedCount	All	High
Alarms Fired	AlarmsFiredCount	AlarmsFiredCount	All	High
Alarms Pending Size	AlarmsPendingSize	AlarmsPendingSize	All	High
Dynamic Cache	**ITM Table Name: KYNCACHE**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: Dynamic Caching			
Maximum In-Memory Cache Size	MaxInMemoryCacheEntryCount	MaxInMemoryCacheEntryCount	All	Low
Current In-Memory Cache Size	InMemoryCacheEntryCount	InMemoryCacheEntryCount	All	Low
In-Memory and Disk Timeouts	TimeoutInvalidationCount	TimeoutInvalidationCount	All	Low
In-Memory and Disk Timeout Rate (per sec)	TimeoutInvalidationCount	TimeoutInvalidationCount	All	Low
Dynamic Cache Templates	**ITM Table Name: KYNCACHT**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: Templates			
Current Cache Size	InMemoryAndDiskCacheEntry Count	InMemoryAndDiskCacheEntry Count	All	Low
Disk Hits	HitsOnDiskCount	HitsOnDiskCount	All	Low
Disk Hit Rate(per sec)	HitsOnDiskCount	HitsOnDiskCount	All	Low
Memory Hits	HitsInMemoryCount	HitsInMemoryCount	Extended	Low
Memory Hit Rate(per sec)	HitsInMemoryCount	HitsInMemoryCount	Extended	Low
Remote Hits	RemoteHitCount	RemoteHitCount	All	Low
Remote Hit Rate(per sec)	RemoteHitCount	RemoteHitCount	All	Low
Cache Misses	MissCount	MissCount	Extended	Low

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping (continued).

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

Cache Miss Rate(per sec)	MissCount	MissCount	Extended	Low
Remote Cache Entries Received	RemoteCreationCount	RemoteCreationCount	All	Low
Remote Cache Entry Receive Rate(per sec)	RemoteCreationCount	RemoteCreationCount	All	Low
Client Requests	ClientRequestCount	ClientRequestCount	All	Low
Client Request Rate(per sec)	ClientRequestCount	ClientRequestCount	All	Low
Cluster Requests	DistributedRequestCount	DistributedRequestCount	All	Low
Cluster Request Rate(per sec)	DistributedRequestCount	DistributedRequestCount	All	Low
Total Explicit Invalidations	ExplicitInvalidationCount	ExplicitInvalidationCount	All	Low
Total Explicit Invalidation Rate(per sec)	ExplicitInvalidationCount	ExplicitInvalidationCount	All	Low
Timeout Invalidations	TimeoutInvalidationCount	TimeoutInvalidationCount	All	Low
Timeout Invalidation Rate(per sec)	TimeoutInvalidationCount	TimeoutInvalidationCount	All	Low
Least Recently Used Invalidations	LruInvalidationCount	LruInvalidationCount	All	Low
Least Recently Used Invalidation Rate(per sec)	LruInvalidationCount	LruInvalidationCount	All	Low
Explicit Memory Invalidations	ExplicitMemoryInvalidationCount	ExplicitMemoryInvalidationCount	All	Low
Explicit Memory Invalidation Rate(per sec)	ExplicitMemoryInvalidationCount	ExplicitMemoryInvalidationCount	All	Low
Explicit Disk Invalidations	ExplicitDiskInvalidationCount	ExplicitDiskInvalidationCount	All	Low
Explicit Disk Invalidations Rate(per sec)	ExplicitDiskInvalidationCount	ExplicitDiskInvalidationCount	All	Low
Explicit Local Invalidations	LocalExplicitInvalidationCount	LocalExplicitInvalidationCount	All	Low
Explicit Local Invalidation Rate(per sec)	LocalExplicitInvalidationCount	LocalExplicitInvalidationCount	All	Low
Explicit Remote Invalidations	RemoteExplicitInvalidationCount	RemoteExplicitInvalidationCount	All	Low
Explicit Remote Invalidation Rate(per sec)	RemoteExplicitInvalidationCount	RemoteExplicitInvalidationCount	All	Low
Workload Management Client	**ITM Table Name: KYNWLMCL**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: Workload Management client			

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping (continued).

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

Outgoing Requests	OutgoingIIOPRequestCount	OutgoingIIOPRequestCount	All	Low
Outgoing Request Rate (per sec)	OutgoingIIOPRequestCount	OutgoingIIOPRequestCount	All	Low
Client Cluster Updates	ClientClusterUpdateCount	ClientClusterUpdateCount	All	Low
Client Cluster Update Rate (per sec)	ClientClusterUpdateCount	ClientClusterUpdateCount	All	Low
Client Response Time	ClientResponseTime	ClientResponseTime	All	Medium
Workload Management Server	**ITM Table Name: KYNWLMSR**			
		WebSphere PMI Level		
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: Workload Management server			
Incoming Requests	IIOPRequestCount	IIOPRequestCount	Extended	Low
Incoming Request Rate (per sec)	IIOPRequestCount	IIOPRequestCount	Extended	Low
Incoming Strong Affinity Requests	StrongAffinityIIOPRequestCount	StrongAffinityIIOPRequestCount	All	Low
Incoming Strong Affinity Request Rate (per sec)	StrongAffinityIIOPRequestCount	StrongAffinityIIOPRequestCount	All	Low
Incoming Nonaffinity Requests	NoAffinityIIOPRequestCount	NoAffinityIIOPRequestCount	All	Low
Incoming Nonaffinity Request Rate (per sec)	NoAffinityIIOPRequestCount	NoAffinityIIOPRequestCount	All	Low
Incoming Non-WLM Object Requests	NonWLMEnabledIIOPRequestCount	NonWLMEnabledIIOPRequestCount	All	Low
Incoming Non-WLM Object Request Rate (per sec)	NonWLMEnabledIIOPRequest Count	NonWLMEnabledIIOPRequestCount	All	Low
Server Cluster Updates	ServerClusterUpdateCount	ServerClusterUpdateCount	All	Low
Server Cluster Update Rate (per sec)	ServerClusterUpdateCount	ServerClusterUpdateCount	All	Low
WLM Clients Serviced	WLMClientsServicedCount	WLMClientsServicedCount	All	Low
WLM Clients Serviced Rate (per sec)	WLMClientsServicedCount	WLMClientsServicedCount	All	Low
Concurrent Requests	ConcurrentRequestCount	ConcurrentRequestCount	Extended	High
Server Response Time (ms)	ServerResponseTime	ServerResponseTime	Extended	Medium
Scheduler	**ITM Table Name: KYNSCHED**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: Schedulers			
Poll Count	PollCount	PollCount	All	High
Poll Duration	PollDuration	PollDuration	All	High

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping (continued).

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

Poll Query Duration	PollQueryDuration	PollQueryDuration	All	High
Run Duration	RunDuration	RunDuration	All	High
Task Collision Rate	TaskCollisionRate	TaskCollisionRate	All	High
Task Delay Duration	TaskDelayDuration	TaskDelayDuration	All	High
Task Expiration Rate	TaskExpirationRate	TaskExpirationRate	All	High
Task Failure Count	TaskFailureCount	TaskFailureCount	All	High
Task Finish Count	TaskFinishCount	TaskFinishCount	All	High
Task Finish Rate	TaskFinishRate	TaskFinishRate	All	High
Task Run Rate	TaskRunRate	TaskRunRate	All	High
Web Services	**ITM Table Name: KYNWEBSVC**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: Web services			
Received Requests	ReceivedRequestCount	ReceivedRequestCount	All	Low
Dispatched Requests	DispatchedRequestCount	DispatchedRequestCount	All	Low
Processed Requests	ProcessedRequestCount	ProcessedRequestCount	All	Low
Response Time	ResponseTime	ResponseTime	All	High
Request Response Time	RequestResponseTime	RequestResponseTime	All	Medium
Dispatch Response Time	DispatchResponseTime	DispatchResponseTime	All	Medium
Reply Response Time	ReplyResponseTime	ReplyResponseTime	All	Medium
Payload Size	PayloadSize	PayloadSize	All	Medium
Reply Payload Size	ReplyPayloadSize	ReplyPayloadSize	All	Medium
Request Payload Size	RequestPayloadSize	RequestPayloadSize	All	Medium
WebServices Gateway	**ITM Table Name: KYNWEBSGW**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: Web services Gateway			
Synchronous Requests	SynchronousRequestCount	SynchronousRequestCount	All	Low
Synchronous Responses	SynchronousResponseCount	SynchronousResponseCount	All	Low
Asynchronous Requests	AsynchronousRequestCount	AsynchronousRequestCount	All	Low
Asynchronous Responses	AsynchronousResponseCount	AsynchronousResponseCount	All	Low
Messaging Engines	**ITM Table Name: KYNMSGENG**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: SIB Service > SIB Messaging Engines			
Average Local Wait Time (ms)	LocalMessageWaitTime	LocalMessageWaitTime	All	Low

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping (continued).

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

Expired Messages	ReportEnabledMessagesExpiredCount	ReportEnabledMessagesExpiredCount	All	Low
Incomplete Topic Publications	IncompletePublicationCount	IncompletePublicationCount	All	Low
Total Published	TotalMessagesPublishedCount	TotalMessagesPublishedCount	All	Low
Client Communications	**ITM Table Name: KYNCLICOM**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: Standard Statistics			
Clients Attached	ClientsAttachedCount	ClientsAttached	All	Low
API Connections	APIConnectionsCount	APIConnections	All	Low
Errors	ErrorsCount	Errors	All	Low
Writes	WritesCount	Writes	All	Low
Reads	ReadsCount	Reads	All	Low
Writes Blocked	WritesBlockedCount	WritesBlocked	All	Low
Reads Blocked	ReadsBlockedCount	ReadsBlocked	All	Low
Multicast Write (bytes)	MulticastWriteBytesCount	MulticastWriteBytes	All	Low
Multicast Send Messages	MulticastSendMessageCount	MulticastSendMessage	All	Low
Buffered Write (bytes)	BufferedWriteBytesCount	BufferedWriteBytes	All	Low
Buffered Read (bytes)	BufferedReadBytesCount	BufferedReadBytes	All	Low
Message Written (bytes)	MessagesBytesWrittenCount	ClientStats.MessageBytesWritten	All	Low
Message Read (bytes)	MessageBytesReadCount	MessageBytesRead	All	Low
Total Written (bytes)	TotalBytesWrittenCount	TotalBytesWritten	All	Low
Total Read (bytes)	TotalBytesReadCount	TotalBytesRead	All	Low
	Category: Detailed Statistics			
Sent at Highest Priority (bytes)	BytesSentAtHighestPriorityCount	BytesSentAtHighestPriority	All	Low
Sent at Very High Priority (bytes)	BytesSentAtVeryHighPriorityCount	BytesSentAtVeryHighPriority	All	Low
Sent at High Priority (bytes)	BytesSentAtHighPriorityCount	BytesSentAtHighPriority	All	Low
Sent at JMS 9 Priority (bytes)	BytesSentAtJMS9PriorityCount	BytesSentAtJMS9Priority	All	Low
Sent at JMS 8 Priority (bytes)	BytesSentAtJMS8PriorityCount	BytesSentAtJMS8Priority	All	Low
Sent at JMS 7 Priority (bytes)	BytesSentAtJMS7PriorityCount	BytesSentAtJMS7Priority	All	Low
Sent at JMS 6 Priority	BytesSentAtJMS6PriorityCount	BytesSentAtJMS6Priority	All	Low
Sent at JMS 5 Priority (bytes)	BytesSentAtJMS5PriorityCount	BytesSentAtJMS5Priority	All	Low
Sent at JMS 4 Priority (bytes)	BytesSentAtJMS4PriorityCount	BytesSentAtJMS4Priority	All	Low
Sent at JMS 3 Priority (bytes)	BytesSentAtJMS3PriorityCount	BytesSentAtJMS3Priority	All	Low
Sent at JMS 2 Priority (bytes)	BytesSentAtJMS2PriorityCount	BytesSentAtJMS2Priority	All	Low

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping (continued).

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

Sent at JMS 1 Priority (bytes)	BytesSentAtJMS1PriorityCount	BytesSentAtJMS1Priority	All	Low
Sent at JMS 0 Priority (bytes)	BytesSentAtJMS0PriorityCount	BytesSentAtJMS0Priority	All	Low
Sent at Low Priority (bytes)	BytesSentAtLowPriorityCount	BytesSentAtLowPriority	All	Low
Sent at Very Low Priority (bytes)	BytesSentAtVeryLowPriorityCount	BytesSentAtVeryLowPriority	All	Low
Sent at Lowest Priority (bytes)	BytesSentAtLowestPriorityCount	BytesSentAtLowestPriority	All	Low
Received at Highest Priority (bytes)	BytesReceivedAtHighestPriorityCount	BytesReceivedAtHighestPriority	All	Low
Received at Very High Priority (bytes)	BytesReceivedAtVeryHighPriority Count	BytesReceivedAtVeryHighPriority	All	Low
Received at High Priority (bytes)	BytesReceivedAtHighPriorityCount	BytesReceivedAtHighPriority	All	Low
Received at JMS 9 Priority (bytes)	BytesReceivedAtJMS9PriorityCount	BytesReceivedAtJMS9Priority	All	Low
Received at JMS 8 Priority (bytes)	BytesReceivedAtJMS8PriorityCount	BytesReceivedAtJMS8Priority	All	Low
Received at JMS 7 Priority (bytes)	BytesReceivedAtJMS7PriorityCount	BytesReceivedAtJMS7Priority	All	Low
Received at JMS 6 Priority (bytes)	BytesReceivedAtJMS6PriorityCount	BytesReceivedAtJMS6Priority	All	Low
Received at JMS 5 Priority (bytes)	BytesReceivedAtJMS5PriorityCount	BytesReceivedAtJMS5Priority	All	Low
Received at JMS 4 Priority (bytes)	BytesReceivedAtJMS4PriorityCount	BytesReceivedAtJMS4Priority	All	Low
Received at JMS 3 Priority (bytes)	BytesReceivedAtJMS3PriorityCount	BytesReceivedAtJMS3Priority	All	Low
Received at JMS 2 Priority (bytes)	BytesReceivedAtJMS2PriorityCount	BytesReceivedAtJMS2Priority	All	Low
Received at JMS 1 Priority (bytes)	BytesReceivedAtJMS1PriorityCount	BytesReceivedAtJMS1Priority	All	Low
Received at JMS 0 Priority (bytes)	BytesReceivedAtJMS0PriorityCount	BytesReceivedAtJMS0Priority	All	Low
Received at Low Priority (bytes)	BytesReceivedAtLowPriorityCount	BytesReceivedAtLowPriority	All	Low
Received at Very Low Priority (bytes)	BytesReceivedAtVeryLowPriority Count	BytesReceivedAtVeryLowPriority	All	Low
Received at Lowest Priority (bytes)	BytesReceivedAtLowestPriorityCount	BytesReceivedAtLowestPriority	All	Low
Messages Sent at JMS 9 Priority	MessagesSentAtJMS9PriorityCount	MessagesSentAtJMS9Priority	All	Low
Messages Sent at JMS 8 Priority	MessagesSentAtJMS8PriorityCount	MessagesSentAtJMS8Priority	All	Low
Messages Sent at JMS 7 Priority	MessagesSentAtJMS7PriorityCount	MessagesSentAtJMS7Priority	All	Low
Messages Sent at JMS 6 Priority	MessagesSentAtJMS6PriorityCount	MessagesSentAtJMS6Priority	All	Low
Messages Sent at JMS 5 Priority	MessagesSentAtJMS5PriorityCount	MessagesSentAtJMS5Priority	All	Low

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping (continued).

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

Messages Sent at JMS 4 Priority	MessagesSentAtJMS4PriorityCount	MessagesSentAtJMS4Priority	All	Low
Messages Sent at JMS 3 Priority	MessagesSentAtJMS3PriorityCount	MessagesSentAtJMS3Priority	All	Low
Messages Sent at JMS 2 Priority	MessagesSentAtJMS2PriorityCount	MessagesSentAtJMS2Priority	All	Low
Messages Sent at JMS 1 Priority	MessagesSentAtJMS1PriorityCount	MessagesSentAtJMS1Priority	All	Low
Messages Sent at JMS 0 Priority	MessagesSentAtJMS0PriorityCount	MessagesSentAtJMS0Priority	All	Low
Messages Received at JMS 9 Priority	MessagesReceivedAtJMS9Priority Count	MessagesReceivedAtJMS9Priority	All	Low
Messages Received at JMS 8 Priority	MessagesReceivedAtJMS8Priority Count	MessagesReceivedAtJMS8Priority	All	Low
Messages Received at JMS 7 Priority	MessagesReceivedAtJMS7Priority Count	MessagesReceivedAtJMS7Priority	All	Low
Messages Received at JMS 6 Priority	MessagesReceivedAtJMS6Priority Count	MessagesReceivedAtJMS6Priority	All	Low
Messages Received at JMS 5 Priority	MessagesReceivedAtJMS5Priority Count	MessagesReceivedAtJMS5Priority	All	Low
Messages Received at JMS 4 Priority	MessagesReceivedAtJMS4Priority Count	MessagesReceivedAtJMS4Priority	All	Low
Messages Received at JMS 3 Priority	MessagesReceivedAtJMS3Priority Count	MessagesReceivedAtJMS3Priority	All	Low
Messages Received at JMS 2 Priority	MessagesReceivedAtJMS2Priority Count	MessagesReceivedAtJMS2Priority	All	Low
Messages Received at JMS 1 Priority	MessagesReceivedAtJMS1Priority Count	MessagesReceivedAtJMS1Priority	All	Low
Messages Received at JMS 0 Priority	MessagesReceivedAtJMS0Priority Count	MessagesReceivedAtJMS0Priority	All	Low
Messaging Engine Communications	**ITM Table Name: KYNMECOM**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: SIB Communications > Messaging Engines > Standard Statistics			
Messaging Engine Attached	MEAttachedCount	MEAttached	All	Low
API Connections	APIConnectionsCount	APIConnections	All	Low
Errors	ErrorsCount	Errors	All	Low
Writes	WritesCount	Writes	All	Low
Reads	ReadsCount	Reads	All	Low
Writes Blocked	WritesBlockedCount	WritesBlocked	All	Low
Reads Blocked	ReadsBlockedCount	ReadsBlocked	All	Low
Buffered Write (bytes)	BufferedWriteBytesCount	BufferedWriteBytes	All	Low
Buffered Reads (bytes)	BufferedReadBytesCount	BufferedReadBytes	All	Low
Message Written (bytes)	MessageBytesWrittenCount	MessageBytesWritten	All	Low

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping (continued).

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

Message Read (bytes)	MessageBytesReadCount	MessageBytesRead	All	Low
Total Written (bytes)	TotalBytesWrittenCount	TotalBytesWritten	All	Low
Total Read (bytes)	TotalBytesReadCount	TotalBytesRead	All	Low
Durable Subscriptions	**ITM Table Name: KYNDURSUB**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: SIB Service > SIB Messaging Engines > Destinations > Topicspaces > Durable Subscriptions			
Available Message	AvailableMessageCount	AvailableMessageCount	All	Low
Total Messages Consumed	TotalMessagesConsumedCount	TotalMessagesConsumedCount	All	Low
Best Effort Non-persistent Messages Consumed	BestEffortNonPersistentMessages ConsumedCount	BestEffortNonPersistentMessages ConsumedCount	All	Low
Express Non-persistent Messages Consumed	ExpressNonPersistentMessages ConsumedCount	ExpressNonPersistentMessages ConsumedCount	All	Low
Reliable Non-persistent Messages Consumed	ReliableNonPersistentMessages ConsumedCount	ReliableNonPersistentMessages ConsumedCount	All	Low
Reliable Persistent Messages Consumed	ReliablePersistentMessages ConsumedCount	ReliablePersistentMessages ConsumedCount	All	Low
Assured Persistent Messages Consumed	AssuredPersistentMessages ConsumedCount	AssuredPersistentMessages ConsumedCount	All	Low
Aggregate Message Wait Time	AggregateMessageWaitTime	AggregateMessageWaitTime	All	High
Local Message Wait Time	LocalMessageWaitTime	LocalMessageWaitTime	All	High
Local Oldest Message Age	LocalOldestPublicationAge	LocalOldestPublicationAge	All	Max
Queue	**ITM Table Name: KYNMSGQUE**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: SIB Service > SIB Messaging Engines > Destinations > Queues			
Available Message	AvailableMessageCount	AvailableMessageCount	All	Low
Unavailable Message	UnavailableMessageCount	UnavailableMessageCount	All	Low
Local Producer Attaches	LocalProducerAttachesCount	LocalProducerAttachesCount	All	Low
Local Producer	LocalProducerCount	LocalProducerCount	All	Low
Local Consumer Attaches	LocalConsumerAttachesCount	LocalConsumerAttachesCount	All	Low
Local Consumer	LocalConsumerCount	LocalConsumerCount	All	Low
Total Messages Produced	TotalMessagesProducedCount	TotalMessagesProducedCount	All	Low

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping (continued).

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

Best Effort Non-persistent Messages Produced	BestEffortNonPersistentMessages ProducedCount	BestEffortNonPersistentMessages ProducedCount	All	Low
Express Non-persistent Messages Produced	ExpressNonPersistentMessages ProducedCount	ExpressNonPersistentMessages ProducedCount	All	Low
Reliable Non-persistent Messages Produced	ReliableNonPersistentMessages ProducedCount	ReliableNonPersistentMessages ProducedCount	All	Low
Reliable Persistent Messages Produced	ReliablePersistentMessages ProducedCount	ReliablePersistentMessages ProducedCount	All	Low
Assured Persistent Messages Produced	AssuredPersistentMessages ProducedCount	AssuredPersistentMessages ProducedCount	All	Low
Total Messages Consumed	TotalMessagesConsumedCount	TotalMessagesConsumedCount	All	Low
Best Effort Non-persistent Messages Consumed	BestEffortNonPersistentMessages ConsumedCount	BestEffortNonPersistentMessages ConsumedCount	All	Low
Express Non-persistent Messages Consumed	ExpressNonPersistentMessages ConsumedCount	ExpressNonPersistentMessages ConsumedCount	All	Low
Reliable Non-persistent Messages Consumed	ReliableNonPersistentMessages ConsumedCount	ReliableNonPersistentMessages ConsumedCount	All	Low
Reliable Persistent Messages Consumed	ReliablePersistentMessages ConsumedCount	ReliablePersistentMessages ConsumedCount	All	Low
Assured Persistent Messages Consumed	AssuredPersistentMessages ConsumedCount	AssuredPersistentMessages ConsumedCount	All	Low
Report Enabled Messages Expired	ReportEnabledMessages ExpiredCount	ReportEnabledMessages ExpiredCount	All	Low
Aggregate Message Wait Time	AggregateMessageWaitTime	AggregateMessageWaitTime	All	Low
Local Message Wait Time	LocalMessageWaitTime	LocalMessageWaitTime	All	Low
Local Oldest Message Age	LocalOldestMessageAge	LocalOldestMessageAge	All	Low
Topic Spaces	**ITM Table Name: KYNTOPICSP**			
TEP Console Column Name	**WebSphere 7 PMI Attribute**	**WebSphere 8 PMI Attribute**	**WebSphere PMI Level**	**Overhead**
	Category: SIB Service > SIB Messaging Engines > Destinations > Topicspaces			
Incomplete Publication	IncompletePublicationCount	IncompletePublicationCount	All	Low
Local Publisher Attaches	LocalPublisherAttachesCount	LocalPublisherAttachesCount	All	Low
Local Publisher	LocalPublisherCount	LocalPublisherCount	All	Low
Total Local Subscription	TotalLocalSubscriptionCount	TotalLocalSubscriptionCount	All	Low
Non-durable Local Subscription	NonDurableLocalSubscriptionCount	NonDurableLocalSubscriptionCount	All	Low
Durable Local Subscription	DurableLocalSubscriptionCount	DurableLocalSubscriptionCount	All	Low
Total Messages Published	TotalMessagesPublishedCount	TotalMessagesPublishedCount	All	Low

Table 77. TEP Console Workspace Columns to WebSphere PMI Attribute Mapping (continued).

TEP Console Workspace Columns to WebSphere PMI Attribute Mapping

Best Effort Non-persistent Messages Published	BestEffortNonPersistentMessages PublishedCount	BestEffortNonPersistentMessages PublishedCount	All	Low
Express Non-persistent Messages Published	ExpressNonPersistentMessages PublishedCount	ExpressNonPersistentMessages PublishedCount	All	Low
Reliable Non-persistent Messages Published	ReliableNonPersistentMessages PublishedCount	ReliableNonPersistentMessages PublishedCount	All	Low
Reliable Persistent Messages Published	ReliablePersistentMessages PublishedCount	ReliablePersistentMessages PublishedCount	All	Low
Assured Persistent Messages Published	AssuredPersistentMessages PublishedCount	AssuredPersistentMessages PublishedCount	All	Low
Total Local Subscription Hits	TotalLocalSubscriptionHitCount	TotalLocalSubscriptionHitCount	All	Low
Best Effort Non-persistent Local Subscription Hits	BestEffortNonPersistentLocal SubscriptionHitCount	BestEffortNonPersistentLocal SubscriptionHitCount	All	Low
Express Non-persistent Local Subscription Hits	ExpressNonPersistentLocal SubscriptionHitCount	ExpressNonPersistentLocal SubscriptionHitCount	All	Low
Reliable Non-persistent Local Subscription Hits	ReliableNonPersistentLocal SubscriptionHitCount	ReliableNonPersistentLocal SubscriptionHitCount	All	Low
Reliable Persistent Local Subscription Hits	ReliablePersistentLocal SubscriptionHitCount	ReliablePersistentLocal SubscriptionHitCount	All	Low
Assured Persistent Local Subscription Hits	AssuredPersistentLocal SubscriptionHitCount	AssuredPersistentLocal SubscriptionHitCount	All	Low
Report Enabled Publication Expired	ReportEnabledPublications ExpiredCount	ReportEnabledPublications ExpiredCount	All	Low
Local Oldest Publication Age	LocalOldestPublicationAge	LocalOldestPublicationAge	All	Max

Important: Some attributes were renamed between WebSphere Application Server versions 7 and 8. The names for version 8 also apply to version 8.5.

Data sources for workspaces

ITCAM Agent for Application Diagnostics collects data from several sources on the application server. Different workspaces use data from different sources.

Types of data

The Agent collects the following four types of data:

- Resource data
- Request data
- Data from WebSphere log files
- Process data from the operating system

These four categories are based on the source from which the monitoring data is collected. The workspaces in the Tivoli Enterprise Portal display data from these sources. Usually, each workspace displays data from one of the sources. Some workspaces contain summary information collected from one or more sources and processed by the Agent.

Resource Data

ITCAM Agent for WebSphere Applications obtains resource data from the Performance Monitoring Infrastructure (PMI) component that WebSphere Application Server provides. This data mostly contains usage and performance information about a resource in the system. For example, the "DB Connection Pools" workspace provides data about connection pool resources, including how long a connection is checked out, how many threads are waiting for connection, and so on.

Table 78. Workspaces that display resource data, which is obtained from PMI.

Workspace	Description
"Web Applications workspace" on page 125	Displays performance data for each web application (.war). This data includes number of requests, average response time, and number of errors. Note that one Web application may have multiple URLs for user requests and the response times for all the requests are aggregated in this window.
"Servlets/JSPs - Selected Web Application workspace" on page 120	Breaks down the performance data for a particular Web application into the servlets or JavaServer pages (JSPs) that it contains. Again, each servlet/JSP can contain or be mapped to multiple URLs and all user requests are combined.
"Sessions workspace" on page 122	Provides information regarding HTTP sessions created by each Web application. HTTP sessions are used to maintain a user session between multiple invocations and stores user specific data. This workspace also displays the total, average, maximum, and minimum sizes of the user data stored for each Web application.
"EJB Containers workspace" on page 87	Provides an overview of the performance of different types of Enterprise JavaBeans (EJBs) deployed in the application server.
"Enterprise Java Beans workspace" on page 89	Displays the performance data for each EJB deployed in the application. Based on the Bean type, data is available in the appropriate columns.
"Container Transactions workspace" on page 79	Provides performance data regarding Java® Transaction API (JTA) transactions the EJBs are involved in.
"Container Object Pools workspace" on page 78	Provides information about the behavior of stateless and entity bean pools.
"DB Connection Pools workspace" on page 82	Displays the usage data regarding Database connection pools such as the number of connections available, checked out, threads waiting for a connection, and so on. This workspace is useful in understanding the pool usage and identifying potential bottlenecks in application performance when a thread is waiting or getting timed out for a connection from the pool.

Table 78. Workspaces that display resource data, which is obtained from PMI. (continued)

Workspace	Description
"J2C Connection Pools workspace" on page 94	Displays the usage data for connection pools set up for Java Connector Architecture (JCA) based resource adapters. The WebSphere Application Server creates connection pools for the resource adapters that are deployed (some of the adapters are provided by application server installation itself) and this workspace is useful in monitoring performance bottlenecks in terms of wait times to obtain a connection.
"Pool Analysis workspace" on page 103	Provides information about the usage of several types of pools associated with each application server, including Web container pools, ORB pools, J2C connection pools, and database connection pools. This workspace helps you detect resource constraints and potential performance congestion.
"Thread Pools workspace" on page 123	Displays the usage data for thread pools. The data can be used to determine whether the pool is configured correctly to service user requests. For example, the Web Container thread pool is used to execute servlet requests from the users and if the number of threads in the pool is small compared to the number of incoming requests, there will be a delay in servicing them leading to slower response times.
"Thread Pool Trend workspace" on page 124	Displays trend information about thread pool size and usage.
Cache Analysis: Dynamic Cache"Cache Analysis workspace" on page 76	Provides the usage data of the various dynamic caches that have been configured in the system. In WebSphere Application Server 6.x and later, multiple caches can be configured. Also provides the usage data for each dynamic cache template. The templates are unique IDs that are specified in the cachespec.xml files to identify different URLs that must be cached.

Table 78. Workspaces that display resource data, which is obtained from PMI. (continued)

Workspace	Description
"Workload Management workspace" on page 134	Workload management distributes the user requests made through the Object Request Broker (ORB) to different servers in a cluster. This usually means that this feature will come into play only when remote EJB calls are made over the ORB. This feature is applicable only in the ND (Network Deployment) environment when clusters are set up, so that the workload can be distributed when remote EJB calls are invoked over the ORB. If the ORB is not used, this feature is not exercised and there will be no data in this workspace. If a server has both Servlets and EJBs on the same server instance, the calls are usually configured to be local calls instead of remote calls for better performance, and hence the ORB will not come into play. The server side data provides information about the number of requests received on the server side (for example, the EJB container receiving the user requests).
"Scheduler workspace" on page 121	Scheduler service runs periodic tasks. Schedulers are persistent transactional timer services that run Enterprise JavaBean methods or send Java Message Service messages using any JEE server application.
"Web Services workspace" on page 127	Provides performance data on the Web Services hosted by the application server instance. Web Services provides data regarding number of Web services loaded, number of requests delivered, size of the requests, and so on. Also includes information on the Web services gateway, which is used to map an existing service - either an inbound or an outbound service - to a new Web service that appears to be provided by the gateway. The gateway acts as a proxy: your gateway service users need not know whether the underlying service is being provided internally or externally. The gateway provides you with a single point of control, access and validation of Web service requests, and allows you to control which Web services are available to different groups of Web service users.
"Workplace Mail workspace" on page 135	Provides aggregated statistics of the usage information about the incoming message traffic.
"Messages Queues workspace" on page 99	Provides information about message delivery state, including ready retry, unprocessed, and dead.

Table 78. Workspaces that display resource data, which is obtained from PMI. (continued)

Workspace	Description
"Messaging workspace" on page 101	The messaging engines defined in various Service Integration Buses in this application server. Provides performance numbers on each messaging engine such as number of messages published. This workspace displays data only when a Service Integration Bus (SIB) is available in the system.
"Client Communications workspace" on page 77	Provides communication details with distinct client processes that are currently network-connected to the Service Integration Buses of this application server. The data deals with messages sent and received from and to the various client processes.
"Messaging Engine Communications workspace" on page 100	Provides information about other application servers that are hosting messaging engines and are network-connected to this application server. The Service Integration Bus is used to send and receive messages from these messaging engines.
"Destinations workspace" on page 85	Provides performance data and counters for the destinations of a selected messaging engine. This includes the numbers of available and unavailable messages, numbers of messages produced and consumed, aggregated wait times and so on.
"WMQ Client Link Communications workspace" on page 132	Provides information regarding communication to WebSphere MQ JMS clients that are connected to this application server.
"WMQ Link Communications workspace" on page 133	Provides information regarding communication to WebSphere MQ JMS queue managers that are connected to this application server.
"Alarm Manager workspace" on page 71	Provides aggregated information about the alarms for each work manager. This includes the number of alarms created, fired, canceled and so on.
"DCS Stacks workspace" on page 84	Provides aggregated information about each DCS stack within the entire WebSphere Application Server domain, including multiple nodes and servers. This includes the incoming and outgoing message size, the number of incoming and outgoing messages, congestion events, and message buffer re-allocations.
"Durable Subscriptions workspace" on page 86	Provides statistic counters for the durable subscriptions of a selected topic.
"High Availability Manager workspace" on page 92	Provides aggregated information about high availability managers.

Table 78. Workspaces that display resource data, which is obtained from PMI. (continued)

Workspace	Description
"IMAP/POP workspace" on page 93	Provides aggregated statistics of the usage information about the IMAP service and the POP3 service connectivity, especially for the performance-related connectivity.
"Service Components workspace" on page 119	Provides overview performance of the key service components. WebSphere servers feature their own service components, and each of these components has its own set of event points that can be monitored.
"Service Component Elements workspace" on page 117	Lists performance metrics for all the service components and their elements. Service components contain one or more elements, which are sets of different steps processed in each service component. In turn, each element has its own set of event natures, which are key points that are reached when processing a service component element.

The availability of data in these workspaces depends on whether PMI is turned on in the WebSphere Application Server, and on the level of PMI data collection that is turned on.

PMI might be enabled at None, Basic, Extended, All, Custom levels. Each of these levels turns on a set of data counters. The higher level is inclusive of all the counters turned on at the lower level. As you go higher, the cost overhead for the collection increases. The "low" level incurs the least cost (usually obtains data that displays various "counts") and the "maximum" level incurs the highest cost (this, for example, returns time average data that requires extra memory and processing).

There is an additional "custom" level where individual data attributes can be turned on in addition to the data collection levels based on cost.

Hence, to view the Resource data in the portal workspaces, you will need to complete the following steps:

1. Have the appropriate resources defined. For example, JDBC providers and Datasources defined with connection pools to see data in DB Connection pools, Schedulers defined to see any data in the Schedulers workspace, and so on.
2. Turn on the PMI monitoring in the WebSphere Application Server (either through the admin console, wsadmin, or custom scripts).
3. Select the appropriate level of PMI data collection based on the desired data that needs to be monitored.

For a list of the PMI categories and attributes that the Agent workspaces and tables use, see "WebSphere PMI Attribute Mapping" on page 373.

Request Data

The Request data traces user transactions and measures the time to perform various activities (such as database access and JMS operations). Depending on the Request Data workspace, this information is grouped into various categories. For example, in the Request Analysis workspace the data is grouped by the request

name (either the URL for servlets/JSPs or the EJB name) and in DataSources workspaces by the name of the Datasource.

ITCAM Agent for WebSphere Applications tracks the user transactions by modifying application and WebSphere system Java classes by adding method entry and exit "hooks". These hooks are callback methods into the ITCAM Data collector for WebSphere module that will track a user transaction as it travels through the classes in various modules (servlets, EJBs, Datasources, JMS, and so on). The application and WebSphere Application Server system Java classes are modified when they are loaded by WebSphere classloaders. During this load time, based on the type of class - Servlets, EJB, Datasource, JMS, JCA, JNDI, and so on - different callback methods are injected into the class using "Byte Code Modification" (BCM).

Table 79. Workspaces that display request data, which is obtained through Byte Code Modification.

Workspace	Monitoring level	Description
"Request Analysis workspace" on page 107	Level 1	This workspace displays the number of user requests that were tracked during the sampling interval and their average response times. The requests are grouped by URLs for servlet calls and EJB names for direct EJB calls.
"Request Baseline workspace" on page 109	Level 1	This workspace displays aggregated information about the request baseline. In the baselining process, the agent collects statistical information about a request completion times and uses this information to assign "fair" and "bad" thresholds for requests.
"Request Analysis workspace" on page 107	Level 2	In addition to Level 1 data, the workspace also shows the breakdown of the response times into application, SQL Query, SQL Update, JCA, JMS, JNDI, SCA, web services processing times. This breakdown can be displayed in milliseconds and as a percentage of average response time.

Table 79. Workspaces that display request data, which is obtained through Byte Code Modification. (continued)

Workspace	Monitoring level	Description
"Selected Request - Datasources workspace" on page 115 "Selected Request - JMS Queues workspace" on page 115 "Selected Request - Resource Adapters workspace" on page 116 "Selected Request - Service Components workspace" on page 117	Level 2	To access this workspace, clicking the link icon on the row header of each row in the Request Analysis workspace. This workspace provides more details on the resources accessed by the selected user transaction - including the resource names, the average response time, and the longest response time during the sampling interval.
"Data sources workspace" on page 80	Level 2	This workspace displays the time spent on various Data source operations. The operations include obtaining a connection, and executing a query or update. The workspace also shows the number of connections used during the sampling interval. The data in this workspace supplements the "DB Connection Pools workspace" on page 82 by identifying the reason for long connection checkout times.
"JMS Summary workspace" on page 96	Level 2	This workspace provides count and time measurements for JMS operations: send, receive, browse, and publish. It displays data on a queue and topic basis. The data provides a breakdown of the JMS delay shown in the Request Analysis workspace.

The *Monitoring Level* determines the amount of collected request data. At Level 2 the Agent collects more detailed data and incurs additional overhead in terms of memory and processing time. The default is Level 1. To change the value, use the "Start_Request_Monitoring : Begin reporting request data" on page 296 Take Action command.

Another parameter that determines the amount of data collected is the Request Data Sampling Rate. It specifies the percentage of user requests that the Agent tracks and monitors. When the load on the system is very large, tracking every single user request becomes very expensive. Therefore, the Agent uses a sampling approach to monitor the performance of the applications. The default is 2% (i.e. only 2 out of every 100 user requests are tracked).

However, the load on your system might be very low (for example, in a test system you might apply a 10 user load). In this case, you might see no data in the Request Data workspaces with the default setting of 2%, as the probability of tracking one of the 10 requests will be very low. Hence, you need to increase the sampling rate in systems with low load. Use the "Set_Request_Sampling_Rate: Set the sampling rate for request data" on page 295 Take Action command to do this.

Log File Data

ITCAM Agent for WebSphere Applications reads the application server log files and analyzes them to display data in several workspaces.

Table 80. Workspaces that display log file data.

Workspace	Log file	Description
"Garbage Collection Analysis workspace" on page 90	Native error file specified in application server configuration. The file name is set when configuring the Data Collector (the default is `gc.log`).	ITCAM Agent for WebSphere Applications scans the verbose garbage collection (GC) log to provide information about how the GC is performing. This workspace can identify application performance issues when the GC consumes a lot of time. Such issues usually happen when the heap size parameters in the JVM are not set correctly. You can stop and start the collection of GC data using the Start_GC_Monitoring and Stop_GC_Monitoring Take Action commands. **Important:** the Take Action command does not turn on and off the verbose GC flag in WebSphere JVM. This flag is required for collection of GC data. You might need to enable or disable it using the application server admin console.
"Allocation Failures workspace" on page 72	Same as Garbage Collection Analysis	Provides information about heap allocation failures that cause the JVM to invoke garbage collection.
"JVM Stack Trend workspace" on page 97	Same as Garbage Collection Analysis	Provides trend data regarding JVM CPU usage, JVM garbage collection, and JVM heap usage. Displays Operating System data for CPU usage.

Table 80. Workspaces that display log file data. (continued)

Workspace	Log file	Description
"Log Analysis workspace" on page 98	SystemOut.log	The Agent scans the application server SystemOut.log file and retrieves the messages for display in this workspace. Use the workspace to be informed about the health of the application server and also to create situations when certain message IDs are encountered.
"Log Analysis workspace" on page 98	Data Collector message events	Displays the Data Collector diagnostic messages, informing whether the Data Collector has initialized and is working correctly.

Application server process data from the operating system

ITCAM Agent for WebSphere Applications obtains the system CPU usage for the application server process by making operating system calls. This data is displayed in the "Application Server Summary and Business Process Manager Summary workspaces" on page 50 in the **CPU Used (ms)** and **CPU Used (%)** columns. The "JVM Stack Trend workspace" on page 97 also uses this data.

The "OS Stack workspace" on page 102 displays detailed operating system performance information for the application server.

WebSphere summary and aggregated information

The following workspaces contain summary or aggregated information for WebSphere Application Server:

Table 81. Workspaces that display summary and aggregated information.

Workspace	Description
"Application Server Summary and Business Process Manager Summary workspaces" on page 50	This workspace displays overall statistic information for each application server that is monitored by the agent. The information includes history of heap usage, response times, request rates, and % CPU used.
"WebSphere Agent workspace" on page 128	This workspace displays events occurring within the agent and all the application servers on the host. It also displays status information about the agent and the online/offline status of the monitored servers.
"EJB Tier Analysis workspace" on page 110	The workspace displays information about the health of a WebSphere application based on response time and completion rates for EJB requests. It also displays ORB thread pool information and PMI information related to EJB requests.

Table 81. Workspaces that display summary and aggregated information. (continued)

Workspace	Description
"Backend Tier Analysis workspace" on page 112	The workspace displays information about the health of a WebSphere application based on response time for Backend Tier requests. It also displays information about backend tier resources, including Data Sources, JMS resources, JDBC and JCA Pools, and JVM statistics.
"Web Tier Analysis workspace" on page 113	The workspace displays information about the health of a WebSphere application based on response time and completion rates for Web Tier requests. It also displays WebContainer thread pool information and PMI information related to HTTP sessions.

z/OS region workspaces

In a z/OS environment, most workspace tables report data at both a region and server instance level. The advantage is that you can view metrics collected at both levels and switch between server instance lever and region level.

Data Display Problems

If you do not see data in the portal workspaces, use the following checklist to verify the settings.

Workspace	Checkpoint	Comments
All Workspaces	The application server is running and the monitoring agent is connected to it	Check that the **Status** column in the "Application Server Summary and Business Process Manager Summary workspaces" on page 50 shows **Connected**.
All Workspaces	There is user load applied on the application server	The Request data workspaces display data only when user load is applied. The Resource data workspaces still display data rows even if load is not applied, but the columns will either be empty or display zeros. The data rows in this case are created from the application server configuration information about the resource type.

Workspace	Checkpoint	Comments
Request Data Workspaces	Request Data collection is turned on	Verify by checking the Request Data Monitoring Level column in the Application Server Summary workspace is not **Disabled**. If it is **Disabled**, start the monitoring by using the "Start_Request_Monitoring : Begin reporting request data" on page 296 Take Action command.
Request Data Workspaces	Sampling rate is high enough	The default sampling rate is 2%. If the load on the application server is low, the Agent might fail to track user transactions. Verify the sampling rate in the **Request Data Sampling Rate(%)** column in the "Application Server Summary and Business Process Manager Summary workspaces" on page 50. Set the rate higher by using the "Set_Request_Sampling_Rate: Set the sampling rate for request data" on page 295 Take Action command.
"Data sources workspace" on page 80 "JMS Summary workspace" on page 96	Request Data Monitoring Level is set to Level 2	The **Request Data Monitoring Level** column in "Application Server Summary and Business Process Manager Summary workspaces" on page 50 workspace displays the value. To change the monitoring level, use the "Start_Request_Monitoring : Begin reporting request data" on page 296 Take Action command.
"Data sources workspace" on page 80	Data sources are configured in the application server; user requests are accessing these Data sources	To check the presence of Data sources, use the application server admin console. You need to know application logic to verify whether the user requests are accessing the Data sources. Check "DB Connection Pools workspace" on page 82 for activity with the Data sources.

Workspace	Checkpoint	Comments
"JMS Summary workspace" on page 96	JMS resources (queues, topics) are configured and applications are accessing these resources	To check the existence of JMS resources, use the admin console. You need to know application logic to verify whether these resources are used.
Resource Data Workspaces	Feature is available	Verify the application server feature is being used. For example, Dynamic cache data will be available only when the cache feature has been set up. All "Platform Messaging" workspaces will be available only when the Service Integration Bus has been configured and used.
Resource Data Workspaces	PMI is enabled in the application server	Verify PMI is enabled through the administration console of WebSphere Application Server. Make sure PMI is enabled for the desired modules (for example, WebApplications, ServletSessions, EJBContainer, and so on). To do this, check the **Runtime** tab of the **Performance Monitoring Infrastructure** page in the application server admin console.
Resource Data Workspaces	Data not available in certain columns	Verify PMI level is high enough to capture data for these columns. Check the **Instrumentation Level** column in the workspace that you need to view. **Tip:** Change the PMI level through the application server admin console. The contextual help on the data columns in portal workspace specifies the PMI level at which data will be available.
Resource Data Workspaces	Resource Data Monitoring is turned on	The **Resource Data Monitoring** column in "Application Server Summary and Business Process Manager Summary workspaces" on page 50 must say **Enabled**. If it is set to **Disabled**, turn it on using the"Start_Resource_Monitoring: Begin reporting PMI data" on page 297 Take Action command.

Workspace	Checkpoint	Comments
"Garbage Collection Analysis workspace" on page 90	Verbose GC flag is turned on in WAS	Verify the Verbose GC box is checked in the **Application Server->Process Definition->Java Virtual Machine** page of the admin console.
"Garbage Collection Analysis workspace" on page 90	Garbage Collection Monitoring is enabled	The **Garbage Collection Monitoring** column in"Application Server Summary and Business Process Manager Summary workspaces" on page 50 must be **Enabled**. If it set to **Disabled**, use the "Start_GC_Monitoring: Begin reporting garbage-collection data" on page 296 Take Action command to start it. **Important:** the Take Action command will not enable the verbose GC flag in the application server. You have to do it separately.

Glossary for ITCAM Agent for WebSphere Applications

C

class file A file containing Java object code for a single Java class of objects.

class loader A Java component that loads Java object classes into the heap.

component In object-oriented programming environments like Java, a component is a reusable program building block that can be combined with other components running on the same or different computers in a distributed network to form an application. Examples of a component include a single button in a graphical user interface, an interface to a database manager, and an EJB. A component runs within a container.

connection pool A group of host connections that are maintained in an initialized state, ready to be used without having to create and initialize them.

container In the Enterprise JavaBeans (EJB) architecture, a container is an application program that executes the program building block known as a component (a JavaBean). You write a Java container (such as a GUI button or a database requester) that runs both prewritten and site-developed JavaBeans. Examples of containers include pages on a website as well as the web browsers themselves.

contention In the database manager, a situation in which a transaction attempts to lock a row or table that is already locked.

CPU Central Processing Unit. The part of the computer that controls the interpretation and execution of instructions.

CTG CICS Transaction Gateway. CTG integrates your site WebSphere application server applications with key business systems running on CICS servers. CTG integrates middle-tier application servers with CICS by providing a multiuser gateway that supports web applications written in Java, C/C++, Visual Basic, and COBOL. CTG supports three programming interfaces: the External Call Interface (ECI), the External Presentation Interface (EPI), and the External Security Interface (ESI). The latest version of CTG implements the JEE Connector Architecture (JCA), which allows enterprise Java technology to use CICS applications.

D

data sources Data pertaining to JDBC data streams. These are logical connections to database subsystems.

DCE Distributed Computing Environment. A specification from the Open Software Foundation (OSF) that supports remote function execution across a network. WebSphere application server uses DCE to provide certain types of security, for example, authentication of tokens, tickets, or credentials in an untrusted network.

design patterns Written narratives that define a recurring problem, outline a solution, and describe the trade offs involved in implementing that solution. In object-oriented programming environments like Java, a design pattern also describes certain objects and object classes to be used when creating the architecture for such a solution.

DHCP Dynamic Host Configuration Protocol. A communications protocol that lets network administrators centrally manage the assignment of Internet Protocol (IP) addresses across an organization network. Without DHCP, each computer IP address must be entered manually at each computer. If computers move to another location in another part of the network, a new IP address must be chosen. DHCP lets a network administrator supervise and distribute IP addresses from a central point and automatically sends a new IP address when a computer is plugged into a different location in the network.

dynamic cache A consolidation of several caching activities, including servlets, web services, and WebSphere commands into one service where these activities work together to improve performance and share configuration parameters.

E

EJB Enterprise Java Bean. A component architecture for the development and deployment of object-oriented, distributed, enterprise-level applications. Applications written using the Enterprise JavaBeans architecture are scalable, transactional, multi-user, and secure.

G

garbage collection A facility of the JVM that reallocates and frees up memory lost when objects are created and later destroyed. Garbage collection usually occurs when insufficient heap space is available for allocating new objects, although you can trigger it manually by invoking the System.gc method.

Garbage collection can be expensive since it involves identifying all the unreferenced objects, removing them from the heap, and then possibly compacting the heap.

H

heap A memory storage area known formally as the System Resources area that stores system information about running applications. The main storage area used for allocating Java classes and object instances, as well as executable code. The allocation of objects on the heap creates a live or active object, which exists as long as the JVM maintains a pointer to it. When all references to an object cease to exist, it is subject to garbage collection.

HTTP Hypertext Transfer Protocol. A suite of protocols for the Internet that transfer and display hypertext documents.

HTTP sessions Data related to sessions of specific World Wide Web browsers.

I

IIOP Internet Inter-ORB Protocol. A protocol that distributed programs written in different programming languages can use to communicate over the Internet. IIOP, a part of the Common Object Request Broker Architecture (CORBA), is based on the client/server computing model, in which a client program makes requests of a server program that waits to respond to client requests. With IIOP, you can write client programs that communicate with your existing site server programs wherever they are located and without having to understand anything about the server other than the service it performs and its address (called the Interoperable Object Reference, IOR, which comprises the server port number and IP address).

instrumentation The process of modifying program code so the time it takes the code to run, along with other statistics, can be measured. These modifications insert hooks into these Java methods so that the real time and CPU time spent executing the methods can be measured. Instrumentation is key to certain data-collection features (such as lock analysis) of IBM Tivoli Composite Application Manager Agent for WebSphere Applications.

IBM Tivoli Monitoring platform The software architecture and foundation that support the development and operations of Tivoli Enterprise Portal and its Tivoli Enterprise Monitoring Agents.

J

J2C WebSphere application server implementation of the connection-management and pool-management components of JCA. Applications needing a backend resource (such as a CICS transaction) reference a connection factory suitable for use with that resource. The connection factory in turn calls the WebSphere application server DB2 Relational Resource Adapter, DB2 RRA (which, despite its name, also supports Oracle, SQL Server, and other database management systems). The DB2 RRA passes the connection request to a J2C connection manager, which tries to provide an available connection from a predefined pool. But when all connections are in use, the J2C connection manager calls back to the DB2 RRA to obtain a new connection from the backend system. When this connection is returned, the connection manager adds it to the connection pool for future reuse.

J2C container The third type of container within WebSphere application server (EJB containers and web containers are the other two types). A J2C container contains connection factories that represent backend resources like CICS. It also manages access to these resources via a connection manager associated with each connection factory.

JEE Java Platform, Enterprise Edition. An environment for developing and deploying enterprise applications using the Java language. The JEE platform consists of a set of services, application programming interfaces (APIs), and protocols that provide the functions needed for developing multi-tiered, Web-based applications.

JAR file A Java archive file, which is a compressed file containing many class files along with their directory structure.

JavaBean The Java implementation of component-based software architecture, which defines how small, tested software entities called components can be integrated to build complete software solutions (called containers).

JCA JEE Connector Architecture. A template for writing your own connectors, which is a binding between a JEE application server and a backend enterprise information system (EIS) or data repository such as CICS, IMS, or DB2.

JDBC Java Database Connectivity. An application programming interface (API) for connecting Java programs to the data in a relational database. With this API, you can encode data requests in Structured Query Language (SQL) that JDBC then passes to the database manager for interpretation and processing.

JMS Java Message Service. A programming interface that connects Java programs to middleware messaging applications, for example, WebSphere MQ.

JMX Java Management Extensions. A standard technology for management and monitoring of Java applications and Java environments that defines architecture, application programming interfaces (APIs), and services for application and network management. JMX provides tools for building distributed, Web-based solutions for managing and monitoring Java devices and applications.

A JMX agent is an Mbean container.

JNDI Java Naming and Directory Interface. A programming interface that connects Java applications to naming and directory servers such as LDAP.

JSP JavaServer Page. A web page that specifies one or more servlets whose execution on the web server modifies the page content or appearance before it is presented to the user.

JTA Java Transaction API. An application programming interface developed by Sun Microsystems that specifies standard Java interfaces between a transaction manager (such as Tuxedo) and other players in a distributed transaction system: the resource manager, the application server, the transactional applications, and often the database manager as well.

JVM Java virtual machine. A software implementation of a central processing unit (CPU) that runs Java applets and applications. The JVM provides a software execution engine that safely and compatibly executes the byte codes in Java class files on various microprocessors, whether embedded in a computer or in another electronic device.

JVMPI Java Virtual Machine Profiling Interface. An experimental interface that provides profiling hooks into the Java virtual machine. This interface supports two-way function calls between the JVM and a profiler agent: the virtual machine

notifies the agent of various events, and the agent issues requests for control information.

K

Kerberos A security system from the Massachusetts Institute of Technology that provides security services for networking.

L

LDAP Lightweight Directory Access Protocol. A protocol that uses TCP/IP to access directories. Applications can use these directories for storing common data and for retrieving data. For example, applications can use LDAP to access such information as email address, service configuration parameters, or public keys.

lock A semaphore created through the use of the Java synchronized keyword that prevents simultaneous access to a Java object or section of code.

logstream A system logger application that records error information, unexpected conditions, or failures detected within WebSphere application server code. Logstreams are specific to the z/OS platform.

M

MBeans Managed Beans. A set of standard instrumentation methods for use in Java programs and by Java management applications (such as IBM Tivoli Composite Application Manager Agent for WebSphere Applications) that allows monitoring and management of Java-based applications. An MBean is a JavaBean that represents a JMX-manageable resource.

monitor 1) A transaction environment for maintaining large quantities of data in a consistent state and that controls which users and clients can access data through authorized servers. 2) A programming primitive created so multiple program threads can share the same resource (such as an object). A program creates a monitor for a given resource by requesting it from the system; the system returns a unique ID for that monitor. After that, any thread needing the resource must use the monitor to lock the resource while the thread is using it. If the monitor is already locked, a thread requesting the resource is queued by the system and then given control when the monitor becomes unlocked. Also called a mutex.

MVC The Model/View/Controller design pattern is based on the separation of the application into three objects: the user interface ("view") , the logical structure of the data the application requires ("model"), and the user commands that change the view or the model ("controller"). Design patterns themselves are written narratives that define a recurring problem, outline a solution, and describe the trade offs involved in implementing that solution. (In object-oriented programming environments like Java, a design pattern also describes certain objects and object classes to be used when creating the architecture for such a solution).

N

node Any managed system, such as a WebSphere application server, that the Tivoli Enterprise Portal is monitoring. A node can also be a managed system of subnodes being managed under a primary node.

O

OLT Object Level Trace. A tool for testing distributed applications that include a graphical trace facility and a remote debugger.

ORB Object Request Broker. In object-oriented programming, software that serves as an intermediary by transparently enabling objects to exchange requests and responses.

P

PMI Performance Monitoring Infrastructure. The application programming interface (API) that IBM provides for extracting WebSphere application server performance data. PMI must be enabled and the appropriate instrumentation levels set for the Tivoli Enterprise Monitoring Agent to extract PMI data and populate certain workspaces. PMI runs as an interface to JMX.

portal A Web-based application that commonly provides personalization, single signon, and content aggregation from different sources, and hosts the presentation layer of Information Systems (IS). Portals are becoming the next-generation desktop, delivering ebusiness applications over the web to many types of client devices.

portlet A Java technology-based web component, managed by a portlet container, that process requests and generates dynamic content. Portlets are used by portals as pluggable user interface components that provide a presentation layer to various heterogeneous Enterprise Information Systems (EIS) or Information Systems (IS).

R

request The entry point into an application whose processing or response time directly affects the response time the end user perceives. In IBM Tivoli Composite Application Manager Agent for WebSphere Applications, a request is a servlet, JSP, or EJB method. Also called a transaction.

request analysis A configuration technique for a request (that is, a transaction) within WebSphere application server that allows you to see how often the request runs and what factors about the request degrade its performance. Request analysis involves collecting and aggregating request data on each request that runs. Its primary purpose is to report on requests running in the application server, how often they run, their response time, and what is causing performance degradation.

Request analysis works by dynamic object code instrumentation, which modifies the Java object code for the application classes as they are being loaded into the JVM.

resource adapter An implementation of the JEE Connector Architecture Specification that provides applications with access to resources outside of the server or provides server applications with access to an Enterprise Information System (EIS). A resource adapter can provide applications access to resources such as DB2, CICS, SAP, and PeopleSoft. It can provide an EIS with the ability to communicate with message-driven beans configured on the server. A resource adapter is implemented in a resource adapter archive file, which has an extension of .rar. A resource adapter can be provided as a stand-alone adapter or as part of an application, in which case it is referred to as an embedded adapter.

RMI Remote Method Invocation. A Java standard from Sun Microsystems that performs a remote procedure call (RPC) to allow Java objects stored in the network to be accessed remotely in a client/server environment.

RPC Remote Procedure Call. A protocol based on the Distributed Computing Environment (DCE) of the Open Software Foundation that allows one program to request services from a program running on another computer in a network. (A procedure call is also known as a function call or a subroutine call.) RPC uses the client/server model: the requesting program is the client, and the responding program is the server. As with a local procedure call, an RPC is a synchronous operation: the requesting program is suspended until the remote procedure returns its results.

S

SCA Service Component Architecture. An architecture in which all elements of a business transaction, such as web service access, Enterprise Information System (EIS) service assets, business rules, workflows, databases, and so on, are represented in a service-oriented way.

servlet A Java application that runs in an application server or web server, and that provides server-side processing.

session A series of requests to a servlet that originate from the same user at the same browser. Sessions allow applications running in a web container to tracks individual users.

signature The name of an operation or method and its parameters.

SSL Secure Sockets Layer. A security protocol for communication privacy to provide secure client-server conversations.

struts A widely used framework for developing servlet- or JSP-based web applications that is distributed as open source by the Apache Jakarta Project. Struts encourages application architectures based on the Model 2 approach, a variation of the Model-View-Controller (MVC) design paradigm.

T

thread A dispatchable unit of work.

thread pool The threads that are being used by or are available to a computer program.

transaction A single execution of a workload.

U

URI Uniform Resource Identifier. An identifier for a point of content on the Internet, be it a page of text, a video or sound clip, a still or animated image, or a program. The most common form of URI is the web page address, which is a particular form of URI called a Universal Resource Locator (URL). A URI typically describes the mechanism used to access the resource, the computer that houses the resource, and the name of the resource (such as a file name) on that computer.

URL Universal Resource Locator. The unique address for a file accessible via the Internet. Such a file might be a web page (usually the home page), an image file, or a program such as a Java applet or servlet. The URL comprises the protocol used to access the file, a domain name that identifies a specific computer on the Internet, and a path name that specifies the file location on that computer.

W

Web container A special JEE container that manages web applications in a JEE architecture. A web container specifies a runtime environment for web components, including security, concurrency, lifecycle management, transaction, deployment, and other services. It also enables a web application to access external resources such as relational databases (via JDBC) and Enterprise Java Beans. A web container provides the same services as a JSP container and provides support for managing JavaServer Pages.

Every JEE server contains at least one web container.

workload management The optimization of the distribution of incoming work requests to the application servers, enterprise beans, servlets, and other objects that can effectively process the request.

Chapter 4. ITCAM Agent for J2EE

IBM Tivoli Composite Application Manager for Application Diagnostics Agent for J2EE provides a Systems Management solution for the J2EE Application Server Version 6.2 for distributed platforms. Using ITCAM Agent for J2EE, you can monitor multiple J2EE application servers running on the same physical node. Each application server must be configured with its own IBM Tivoli Composite Application Manager (ITCAM) for J2EE data collector.

The Tivoli Enterprise Monitoring Agent collects performance data from the following four primary sources:

- Response time data for application server requests from the ITCAM for J2EE data collector
- Resource data from the Performance Monitoring Infrastructure (PMI) of J2EE
- J2EE Application Server log messages
- Garbage-collector activity recorded by the JVM verboseGC trace

Attributes within the product collect data about the inner workings of an application server and performance information about user applications running under its control.

Initiating data collection and reporting of data

Because of high processor usage, some data items are not automatically collected and reported. The collection of some data and statistics depends upon the setting of instrumentation levels for certain attributes. If the instrumentation levels are not set appropriately, certain information is not collected and displayed in the workspaces. Similarly, those attributes that collect request and application trace data require you to complete several configuration steps. To collect this data, use one of the following methods to reconfigure data collection:

- Complete configuration steps (as explained in the ITCAM Agent for J2EE installation and customization guide).
- Issue Take Action commands, with which you can take specific action against your J2EE application server using the Tivoli Enterprise Portal.
- Use Manage Tivoli Enterprise Services (as explained in the various IBM Tivoli Monitoring installation manuals and the ITCAM Agent for J2EE installation and customization guide).

Automatic baselining

To display application health status, ITCAM monitors request response times (averaged over a sampling interval, by default 60 seconds) for every application. Every top-level request available in an application is monitored separately.

For every request, two *thresholds* are set, known as *fair* and *bad*. When at least one average request response time for an application rises over the fair threshold, a health warning (yellow) for this application is reported. Similarly, when at least one average request response time rises over the bad threshold, an application health alarm (red) is reported.

ITCAM also monitors the nested requests (for example, database calls) within every top-level request. In the event of a warning or alarm, ITCAM checks which of the nested requests is taking more than its usual share of time. Depending on the type of such nested requests, ITCAM shows whether the client, application, or backend tier is the likely cause of the warning/alarm. Servlet and Portal request types are assigned to the client tier. EJB and User (Custom) request types are assigned to the application tier. All other request types (JNDI, JDBC, JCA, JMS) are assigned to the backend tier.

When ITCAM starts to monitor a new application, it automatically starts a *baselining process*. This process normally runs for seven days but provides updated information every hour from the beginning. During the process, ITCAM collects statistical data for all requests in this application. When the data is collected, ITCAM sets the thresholds automatically; it also records the typical share of response time for each nested request type.

In most cases, this automatic setting is adequate. During the baselining process, the baselines get updated periodically, and the alarms/warnings start to correspond to real problems. You do not have to adjust baselining settings when things are working normally. (The automatic thresholds usually become usable earlier, after the application has been observed through its typical load patterns). If you need to acquire thresholds, based on whatever data is available, before the hourly automatic update, you can manually update baselining.

However, in some situations the threshold levels can become inadequate. This results in either too many false alarms/warnings, or in real problems going undetected. Such situations can be split broadly into two categories:

- If time has passed since the baselining process for an application, its response times might have changed because of configuration alteration, database growth, changing load patterns, and so on. In this case, you might have to run the baselining process again. It is good practice to do it after any configuration or infrastructure change.
- If the thresholds are incorrect immediately after the baselining process has been completed, you might have to adjust the auto threshold settings.

As a last resort, you can also override the thresholds with fixed values. However, do not do this unless you know a lot about the monitored application, or unless instructed by IBM Level 3 Support.

If you need the thresholds set before they are updated automatically for the first time, you can trigger a baseline update. This immediately sets the thresholds based on the request data collected so far.

Additional information

For additional usage information about this agent, see:

- Workspaces
- Attributes
- Situations
- Take Action commands

Workspaces for ITCAM Agent for J2EE

As part of the IBM Tivoli Composite Application Manager for Application Diagnostics Agent for J2EE product integration with the Tivoli Enterprise Portal, the workspaces offer views of monitoring data that provide detailed, current data about the J2EE application servers running on the UNIX and Windows platforms on your site. In addition to reports and graphs, a workspace can contain other views (that is, windows), such as a Notepad editor session, a browser session, a telnet session, an event console, or a Take Action view from which you can issue commands.

Several views of high-level information

Several workspaces provide high-level information to help you meet the monitoring and administrative needs of your site. These workspaces report on status and availability for both the J2EE administrative server and its application server instances. They enable you to easily monitor the availability of your enterprise, the J2EE Application Server, and application server instances.

Primary and secondary workspaces

The workspaces listed in the Navigator are directly accessible and are called *primary workspaces*. Some of these also contain *secondary workspaces*, which are not accessible directly from the Navigator. Instead, you must select and display the primary workspace and then use either a menu option or a special link icon in the primary workspace views to reach the secondary workspaces (sometimes called subsidiary workspaces).

Workspaces with historical data links

Several workspaces provide secondary workspaces that display historical data. You can specify a time span over which to collect historical data, which accumulates and summarizes the data in the primary workspaces that generate them. (The default setting is 15 minutes; you can modify this setting to suit your needs.) The descriptions of the historical workspaces follow the descriptions of the primary workspaces that generate them in the workspace helps.

Available Tivoli Enterprise Portal workspaces

For an overview of the organization of the available workspaces, see Organization of the predefined workspaces.

Organization of the predefined workspaces

The IBM Tivoli Composite Application Manager for Application Diagnostics Agent for J2EE workspaces for the Tivoli Enterprise Portal define data shows that display in the physical view of the Navigator. In addition to the workspaces that the Navigator lists, you can reach their subsidiary (or secondary) workspaces from the primary workspaces (those listed in the Navigator).

Accessing the subsidiary workspaces

You can access the subsidiary workspaces of a primary workspace by using one or more of the following methods:

- From the Navigator:
  1. Select the primary workspace.

2. Right-click the name of the selected workspace in the Navigator.
3. Select **Workspaces** from the menu.
4. Select the desired subsidiary workspace.

- From the View menu:
  1. Select the primary workspace.
  2. Select **View > Workspaces**.
  3. Select the desired subsidiary workspace.
- From a report:
  1. Select the primary workspace.
  2. If the workspace report contains a link, as shown in the following example:

     You can either click the icon to select the row or right-click the icon and select a subsidiary workspace from the menu.
- From a chart view:

  The data displayed in some bar charts and plot charts is linked to subsidiary workspaces. To search for a link, right-click a bar or data point in the chart. If **Link to** displays in the menu, you can select a subsidiary workspace pertaining to the data in the chart.

Workspace organization

The hierarchy levels shown in the Navigator depend upon the customization of the Tivoli Enterprise Portal by your enterprise. However, ITCAM Agent for J2EE provides a set of predefined workspaces, which do not require customization. The following list shows the order and hierarchy of the predefined workspaces provided by the IBM Tivoli Composite Application Manager for Application Diagnostics Agent for J2EE Tivoli Enterprise Monitoring Agent. It is a representation of how the predefined workspaces are organized in the Navigator. For more detailed information about a workspace, click its name in the list.

operating system [for example, Windows]

- *system* [or nodename]
  –
  – J2EE Agent
    - JBoss App Server
      - Application Health Summary
        – Selected Application - Application Tier Analysis
        – Selected Application - Configuration
        – Selected Application - Backend Tier Analysis
        – Selected Application - Request Analysis
        – Selected Application - Health History
        – Selected Application - Client Tier Analysis
        – Application Registry
          - Selected Request - Baseline

    - Request Analysis
      - Selected Request - Datasources
      - Selected Request - JMS Queues
      - Selected Request - Resource Adapters
      - Selected Request - History
    - Garbage Collection Analysis
      - Allocation Failures
      - Garbage Collections - Selected Allocation Failure
    - Log Analysis
    - Datasources
      - Selected Datasource - History
    - JMS Summary
    - Web Applications
      - Servlets / JSPs - Selected Web Application
    - EJB Modules
      - Enterprise Java Beans
    - JCA Connection Pools
    - JTA Resources
- SAP NetWeaver Server Workspace
    - Application Health Summary
      - Selected Application - Application Tier Analysis
      - Selected Application - Configuration
      - Selected Application - Backend Tier Analysis
      - Selected Application - Request Analysis
      - Selected Application - Health History
      - Selected Application - Client Tier Analysis
      - Application Registry
        - Selected Request - Baseline
    - Request Analysis
      - Selected Request - Datasources
      - Selected Request - JMS Queues
      - Selected Request - Resource Adapters
      - Selected Request - History
    - Garbage Collection Analysis
      - Allocation Failures
      - Garbage Collections - Selected Allocation Failure
    - Log Analysis
    - Datasources
      - Selected Datasource - History
    - JMS Summary
    - Web Container
    - Enterprise Java Beans
    - DB Connection Pools
      - Selected DB Connection Pool - History
    - JTA Summary

- Tomcat Server Workspace
  - Application Health Summary
    - Selected Application - Application Tier Analysis
    - Selected Application - Configuration
    - Selected Application - Backend Tier Analysis
    - Selected Application - Health History
    - Selected Application - Client Tier Analysis
    - Application Registry
      - Selected Request - Baseline
  - Request Analysis
    - Selected Request - Datasources
    - Selected Request - JMS Queues
    - Selected Request - Resource Adapters
    - Selected Request - History
  - Garbage Collection Analysis
    - Allocation Failures
    - Garbage Collections - Selected Allocation Failure
  - Log Analysis
  - Datasources
    - Selected Datasource - History
  - JMS Summary
- Oracle App Server Workspace
  - Application Health Summary
    - Selected Application - Application Tier Analysis
    - Selected Application - Configuration
    - Selected Application - Backend Tier Analysis
    - Selected Application - Health History
    - Selected Application - Client Tier Analysis
    - Application Registry
      - Selected Request - Baseline
  - Request Analysis
    - Selected Request - Datasources
    - Selected Request - JMS Queues
    - Selected Request - Resource Adapters
    - Selected Request - History
  - Garbage Collection Analysis
    - Allocation Failures
    - Garbage Collections - Selected Allocation Failure
  - Log Analysis
  - Datasources
    - Selected Datasource - History
  - JMS Summary
  - Web Applications
    - Servlets / JSPs - Selected Web Application
  - EJB Modules

        - Enterprise Java Beans
- BEA WebLogic App Server Workspace
  - Application Health Summary
    - Selected Application - Application Tier Analysis
    - Selected Application - Configuration
    - Selected Application - Backend Tier Analysis
    - Selected Application - Request Analysis
    - Selected Application - Health History
    - Selected Application - Client Tier Analysis
    - Application Registry
      - Selected Request - Baseline
  - Request Analysis
    - Selected Request - Datasources
    - Selected Request - JMS Queues
    - Selected Request - Resource Adapters
    - Selected Request - History
  - Garbage Collection Analysis
    - Allocation Failures
    - Garbage Collections - Selected Allocation Failure
  - Log Analysis
  - Datasources
    - Selected Datasource - History
  - JMS Summary
  - Web Applications
    - Servlets / JSPs - Selected Enterprise Application
  - EJB Components Workspace
    - EJBs - Selected Enterprise Application
  - JDBC Connection Pools
    - Selected JDBC Connection Pool - History
  - JCA Connection Pools
  - JMS Sessions
  - JTA Resources
- WebSphere App Server CE
  - Application Health Summary
    - Selected Application - Application Tier Analysis
    - Selected Application - Configuration
    - Selected Application - Backend Tier Analysis
    - Selected Application - Request Analysis
    - Selected Application - Health History
    - Selected Application - Client Tier Analysis
    - Application Registry
      - Selected Request - Baseline
  - Request Analysis
    - Selected Request - Datasources
    - Selected Request - JMS Queues

        - Selected Request - Resource Adapters
        - Selected Request - History
      - Garbage Collection Analysis
        - Allocation Failures
        - Garbage Collections - Selected Allocation Failure
      - Log Analysis
      - Datasources
        - Selected Datasource - History
      - JMS Summary
      - Web Applications
        - Servlets / JSPs - Selected Web Application
    - J2SE Application
      - Request Analysis
        - Selected Request - Datasources
        - Selected Request - JMS Queues
        - Selected Request - Resource Adapters
        - Selected Request - History
      - Garbage Collection Analysis
        - Allocation Failures
        - Garbage Collections - Selected Allocation Failure
      - DC Message Events
      - Datasources
        - Selected Datasource - History
      - JMS Summary
      - JVM Statistics

For additional information, see:

"Attribute groups used by the predefined workspaces" on page 456

Configuration workspaces

Monitoring Agent configuration and tuning is facilitated in the Tivoli Enterprise Portal through *configuration workspaces*. There are two configuration workspaces: one for the Monitoring Agent level and one for the server level:

- J2EE Agent Configuration workspace
- application server Configuration workspace

Both configuration workspaces have the same tabs and configuration settings.

The J2EE Agent Configuration workspace settings are initial settings applied to all data collectors managed by the Monitoring Agent. For example, when a data collector connects to the Monitoring Agent for the first time or if the data collector configuration was deleted. In both these examples, the configuration settings specified in the J2EE Agent Configuration workspace are applied.

The application server Configuration workspace contains individual server settings and the settings in this workspace override the settings in the J2EE Agent Configuration workspace.

Settings for the J2EE Agent Configuration and application server Configuration workspaces are saved in the following files:

Table 82. Workspace configuration files

Workspace	Configuration file
J2EE Agent Configuration workspace on Windows systems:	*CANDLE_HOME*\TMAITM6*hostname_productcode*.xml
Application server Configuration workspace on Windows systems:	*CANDLE_HOME*\TMAITM6\ *hostname_productcode_servervendor.servernode.server name*.xml
J2EE Agent Configuration workspace on other platforms:	*CANDLE_HOME*/config/*hostname_productcode*.xml
Application server Configuration workspace on other platforms:	*CANDLE_HOME*/config/ *hostname_productcode_servervendor.servernode.server name*.xml

The J2EE Agent Configuration workspace configuration settings are initial settings which are applied to all data collectors managed by the selected J2EE agent. The application server Configuration workspace configuration settings override agent level configuration settings.

Both configuration workspaces have the following two views:

- **Application Diagnostics Configuration view** - this view has the following four tabs
  - Collection (Basic)
  - Collection (Advanced)
  - Application Dashboard (Basic)
  - Application Dashboard (Auto Threshold)
- **Application Servers view** - this view has one tab which lists all application servers monitored by the selected J2EE agent, for each application server, there is a link to application server Configuration workspace.

Application Diagnostics Configuration - Basic Tab

The Basic tab contains the following fields:

- **Request Data Monitoring** - in this field, specify the monitoring level for requesting data from connected data collectors. The following values can be entered into this field:
  - **Disable** - request data is not monitored and is not displayed
  - **Level 1** - only monitors edge request data, for example, servlets, JSPs, EJBs, SCA requests, and web service requests
  - **Level 2** - monitors nested request data in addition to edge request data, for example, JNDI, JMS, JDBC, and JCA requests

Important: This monitoring level is applied by default to newly discovered applications. However, you can set the monitoring level for any operation separately, using the "Set_Application_Monitoring: Set monitoring" on page 536 Take Action command.

- **Request Data Monitoring Method** - in this field, specify the monitoring method used by the Monitoring Agent to govern when it uploads request and garbage collection data from connected data collectors. The following values can be entered into this field:
  - **On Demand** - when the monitoring method is set to On Demand, data is uploaded only when requested by the user. The exception to this is if the cache of data is still current. Whether this data is current is determined by the Request Data On Demand Maximum Sample Age (sec) field in the Collection Advanced tab. With On Demand monitoring, the Tivoli Enterprise Portal response time is slower because the data is collected as requested. However, the retrieved data is the most current available. CPU and memory usage on the monitored systems is lower for On Demand monitoring.
  - **Fixed Interval** - when the monitoring method is set to Fixed Interval, the Monitoring Agent will upload sample data from the data collectors at regular fixed intervals, and respond to a user request using the latest cache of sample data gathered at the last interval. With Fixed Interval monitoring, CPU and memory usage can be higher because more data is collected more frequently but Tivoli Enterprise Portal response time is faster as the data is more readily available. Data samples are calculated for the same time interval and as a result are more consistent.
- **Resource Data Monitoring** - in this field, specify whether resource data is monitored from connected data collectors. The following values can be entered in this field:
  - **Disable** - resource data is not collected by the Monitoring Agent and is not displayed in the Tivoli Enterprise Portal.
  - **Enable** - resource data is collected by the Monitoring Agent and is displayed in the Tivoli Enterprise Portal.
- **Resource Data Monitoring Method** - in this field, specify the monitoring methodology used by the agent to govern when it uploads resource data from connected data collectors. The following values can be entered into this field
  - **On Demand** - when the monitoring method is set to On Demand, data is uploaded only when requested by the user. The exception to this is if the cache of data is still current. Whether this data is current is determined by the Resource Data On Demand Maximum Sample Age (sec) field in the Collection Advanced tab. With On Demand monitoring, the Tivoli Enterprise Portal response time is slower as the data is collected as requested. However, the retrieved data is the most current available. CPU and memory usage on the monitored systems is lower for On Demand monitoring.
  - **Fixed Interval** - when the monitoring method is set to Fixed Interval, the Monitoring Agent will upload sample data from the data collectors at regular fixed intervals, and respond to a user request using the latest cache of sample data gathered at the last interval. With Fixed Interval monitoring, CPU and memory usage can be higher because more data is collected more frequently but Tivoli Enterprise Portal response time is faster as the data is more readily available. Data samples are calculated for the same time interval and as a result are more consistent.
- **Garbage Collection Monitoring** - in this field, specify if verbose garbage collection output monitoring is enabled. The following values can be entered in this field:

- **Disable** - verbose garbage collection output data is not collected by the Monitoring Agent and is not displayed in the Tivoli Enterprise Portal.
- **Enable** - verbose garbage collection output data is collected by the Monitoring Agent and is displayed in the Tivoli Enterprise Portal.

Application Dashboard (Basic) tab

The Application Dashboard (Basic) tab contains the following fields:

- **Application Fair Completion Rate Threshold (%)** - Defines the default completion percentage for application fair availability threshold.
- **Application Bad Completion Rate Threshold (%)** - Defines the default completion percentage for application bad availability threshold.
- **Application Fair Resource Usage Threshold (%)** - Defines the threshold percentage for fair usage level of an application resource.
- **Application Bad Resource Usage Threshold (%)** - Defines the threshold percentage for bad usage level of an application resource.
- **Application Resource Usage Monitoring Cutoff Threshold (%)** - Defines the cutoff threshold percentage for application resources usage monitoring.
- **Request Monitoring Control Level** - Specifies the request monitoring control level for the server. The following entries can be entered to this field:
  - **Application** Request monitoring settings are defined for each application independently.
  - **Server** Request monitoring settings are defined on the server level

The Request Monitoring Control Level option gives you more control over request monitoring settings. In certain sequences, you can benefit from locking the request monitoring control on the server level, because you can change data collector monitoring level in one place.

In ITCAM For Application Diagnostics, the request data monitoring level (Level1 or Level2) that displays on the Tivoli Enterprise Portal depends on the **Request Monitoring Control Level** setting you choose.

- If you select the **Request Monitoring Control Level** as **Application** (the default setting), the monitoring level is set separately for every application. For a newly discovered application, the current monitoring level for the agent is applied. Therefore, to display Level2 data for an application in the Tivoli Enterprise Portal, you must set the monitoring level for the application using the “Set_Application_Monitoring: Set monitoring” on page 536 Take Action command.
- If you select the **Request Monitoring Control Level** as **Server**, the level is set for the server and affects all applications. If you set the Request Data Monitoring Level at Level2 using the “Start_Request_Monitoring : Begin reporting request data” on page 539 Take Action command, the Request Data Monitoring Level for all the applications in this server is Level2. While you can still use the **Set_Application_Monitoring** Take Action command to set the monitoring level for an individual application, the level does not apply as a server-wide level is in operation. To apply the levels set for individual applications, change the **Request Monitoring Control Level** setting to **Application**.

Collection Advanced tab

The Collection Advanced tab contains the following fields:

- **Request Data On Demand Maximum Sample Age (sec)** - The maximum allowed age of sample request data in seconds before collecting a new sample of data. If the monitoring method is set to On Demand, when a user request is

received, and the current sample cache is older than the value specified, then the Monitoring Agent uploads a new sample before servicing the request. Two successive on-demand requests received from users within the period specified by the maximum sample age return the same results without incurring the CPU and memory cost of a new data sample.

- **Request Data Fixed Interval between Collections (sec)** - The amount of time in seconds between uploads of sample request data from the data collectors to the Monitoring Agent when the monitoring method is set to Fixed Interval. When a user request is received, it is serviced from the latest uploaded sample.
- **Request Data Sampling Rate (%)** - The percentage of requests that are sampled for request data monitoring.
- **Resource Data On Demand Maximum Sample Age (sec)** - The maximum allowed age of sample resource data in seconds before collecting a new sample of data. If the monitoring method is set to On Demand, when a user request is received and the current sample cache is older than the value specified in this field, then the Monitoring Agent uploads a new sample before servicing the request. Two successive on-demand requests received from a user within the period specified by the maximum sample age return the same results without incurring the CPU and memory cost of a new data sample.
- **Resource Data Fixed Interval between Collections (sec)** - The amount of time in seconds between uploads of sample resource data from the data collectors to the agent. When a Tivoli Enterprise Portal request is received, it is serviced from the latest uploaded sample.
- **Garbage Collection Polling Interval (sec)** - The interval in seconds between the Monitoring Agent scanning the verbose Garbage Collection output.
- **Log Scan Polling Interval (sec)** - The interval in seconds between the Agent scanning the application server standard output log for changes.

Application Dashboard (Auto Threshold) tab

The Application Dashboard (Auto Threshold) tab contains the fields:

- **Response Time Selection (%)** - Defines the percentage from baseline to be used for response time auto-thresholding.
- **Response Time Deviation (%)** - Defines the deviation for baseline selection to be used for response times auto-thresholding.
- **Fair Response Time Projection (%)** - Defines the percentage to derive the fair response time threshold from the baseline selection.
- **Bad Response Time Projection (%)** - Defines the percentage to derive the bad response time threshold from the baseline selection.

Allocation Failures workspace

This workspace summarizes all the heap-allocation failures that occurred within the Java Virtual Machine (JVM) over the current interval and that caused the JVM to initiate garbage collection.

This workspace displays data provided by the Allocation Failure attributes.

Note to Solaris and HP-UX users: Allocation-failure information is not recorded on these platforms. Consequently this workspace is always empty.

The predefined workspace contains the following items:

- Allocation Failure Elapsed Times bar chart, which displays the number of allocation failures during the current interval.

- Heap Usage bar chart, which displays the heap usage for this JVM. The hover help associated with the bar gives the allocation-failure ID number followed by a range of recording times. This allocation-failure number displays in the Allocation Failures report and associates each bar with that particular row within the report.
- Allocation Failures report, which displays information about the heap-allocation failure that caused the JVM hosting the application server to start its garbage-collection routine.

Accessing the Allocation Failures workspace

To access this workspace from the "Garbage Collection Analysis workspace" on page 433, right-click the link icon, and from the menu, click **Allocation Failures**.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Application Health Summary workspace

The workspace displays the information about the real-time health status of applications monitored by the Tivoli Enterprise Monitoring Agent.

The health status information is collected from the following sources:
- Request Metrics - performance data that measures request execution time collected from the ITCAM instrumentation points in the application code.
- Garbage Collection Metrics - metrics on garbage collection frequency and performance collected from parsing of the GC verbose log file when it is enabled for the application server JVM.
- Operating System metrics - metrics collected about the JVM process and the whole system execution, such as CPU used percentage, paging rate, and so on.

Additionally, the monitoring agent uses thresholds, called Application Health Indicators, to determine the quality of the application service. These thresholds are assigned automatically during baselining or you can manually customize them. There are three monitored application tiers evaluated for health status.
- Client Tier provides performance data and status of application execution in servlets/JSPs or portal containers as well as corresponding thread pools servicing these containers.
- Application Tier provides application execution metrics of EJB containers and custom requests.
- Backend Tier provides application execution in JDBC, JCA, JMS, and JNDI API calls.

This workspace displays data provided by the Application Health Status attributes.

The predefined workspace contains:
- Situation Event console view, which shows the event console with activity associated with the Application Health Summary Navigator item and any other workspaces in the group, as well as linked workspaces. The Navigator displays an event icon overlaid on the Application Health Summary node when a situation becomes true. The report is useful when multiple alerts are raised as you can see them all in a single filtered view.

- Application Health Summary report, which shows the report of the application name, status, and health indicator for client, application, and backend tiers health status.

Accessing the Application Health Summary workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, or z/OS Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the J2EE application server entry of your choice.
5. Within the list of available J2EE application Server workspaces on that server, click the **Application Health** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Application Registry workspace

This workspace displays the information about the server configuration for the application.

This workspace displays data provided by the Application Monitoring Configuration attributes.

The predefined workspace contains:

- Situation Event Console report, which shows the event activity for situations associated with the current Navigator item. The Navigator alerts you when a situation becomes true by displaying an event indicator on the Navigator item. This report is useful when multiple alerts are raised and you might not know newly arrived alerts just by looking at the indicator.
- Application Configuration report, which shows the configurations that are discovered, stored and managed for J2EE applications running within that application server.

Accessing the Application Registry workspace

To access this workspace from the Application Health Summary workspace, use one of the following procedures:

- Within the Navigator, right-click the **Application Health** entry; and select **Workspace** -> **Application Registry**.
- From the primary Tivoli Enterprise Portal menu, select **View** -> **Workspace** -> **Application Registry**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

BEA WebLogic Application Server workspace

This workspace displays overall statistics for each application server being monitored by the Tivoli Enterprise Monitoring Agent.

The predefined workspace contains the following items:

- Heap Usage - History bar chart, which displays free memory size and used memory size (in KB) within the J2EE Application Server heap over time. The hover help associated with the chart displays the exact values.

  This view displays data provided by the Garbage Collection Analysis attributes .
- Response Time - History graph, which shows the server response time to requests over time.

  This view displays data provided by the Request Times and Rates attributes .
- Request Rate - History graph, which shows the rate at which requests have been received by this server over time.

  This view displays data provided by the Request Times and Rates attributes .
- Percent CPU Used - History graph, which shows the percentage of the CPU that this server consumed over time.

  This view displays data provided by the Application Server attributes .
- Application Server Summary report, which displays overall information about this BEA WebLogic Application Server, including JVM statistics and CPU usage statistics.

  This view displays data provided by the Application Server attributes .

Accessing BEA WebLogic Application Server Workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, select the **BEA WebLogic Application Server** entry.

See also:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Data sources workspace

This workspace displays statistical data for the data sources that your applications reference when accessing databases.

This workspace displays data provided by the Datasources attributes.

The predefined workspace contains the following items:

- Worst Data source Query Times bar chart, which shows the longest times (in milliseconds) the application spent waiting to retrieve data from the database during the specified interval
- Worst Data source Update Times bar chart, which shows the longest times (in milliseconds) the application spent updating data within the database during the specified interval

- Data sources - Current Interval report, which displays database usage information. For example, this report shows traffic information, such as the time the application spent trying to connect to the database and the total and average processing times for database queries and updates

Accessing the data sources workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the J2EE application server entry of your choice.
5. Within the list of available J2EE application server workspaces on that server, click the **Datasources** entry.

Selected data source - History workspace

This workspace displays the historical information that corresponds to the information in the data source workspace for a selected data source. Historical information is collected over a specific time span. See the online help for Tivoli Enterprise Portal for a detailed explanation of historical reporting.

Accessing the Selected data source - History workspace

To access this workspace from the data source workspace, use one of the following procedures:

- From the Data sources - Current Interval report, right-click, and from the menu, click **Selected Datasource - History**.
- From Worst Data source Query Times bar chart or the Worst Data source Update Times bar chart, right-click any bar; then, from the menu, select **Link To > Selected Datasource - History**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

DB Connection Pools workspace

This workspace displays information about the database connection pools associated with SAP NetWeaver application server.

This workspace displays data provided by the “DB Connection Pools - NetWeaver attributes” on page 472.

The predefined workspace contains the following items:

- Pool Sizes bar chart, shows the current size of data source pool
- DB Connection Pools report, which displays information about the database connection pool for each defined data source, and an aggregated value that aggregates over all data sources. For example, this report displays the number of threads waiting for a connection and the number of connections created and released

Accessing the DB Connection Pools workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the SAP NetWeaver application server entry of your choice.
5. Within the list of available J2EE application server workspaces on the SAP NetWeaver server, select the **DB Connection Pools** entry.

Selected DB Connection Pool - History workspace

This workspace displays the historical information that corresponds to the information in the DB Connection Pools workspace for a selected connection pool. Historical information is collected over a particular measured time span. See the online help for Tivoli Enterprise Portal for a detailed explanation of historical reporting.

This workspace displays data provided by the "DB Connection Pools - NetWeaver attributes" on page 472.

The predefined workspace contains the following items:

- Active and Available Connections - History table, which displays the history of active and available connections
- Highest Wait Times - History table, which displays the history of the highest wait times (in milliseconds) for each database connection pool
- Selected DB Connection Pool - History report, which displays historical data and statistics in the DB connection pools for a selected connection pool

Accessing the Selected DB Connection Pool - History workspace

To access this workspace from the DB Connection Pools workspace, use one of the following procedures:

- From the DB Connection Pools report, right-click the link icon and select **Selected DB Connection Pool - History**.
- From Pool Size bar chart, right-click any bar, and select **Link To > Selected DB Connection Pool - History**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

DC Message Events workspace

This workspace displays the information about messages generated by the ITCAM for J2EE data collector and the event activity for situations associated with the Navigator item.

This workspace displays data provided by the "DC Messages - J2EE attributes" on page 473. This workspace is available only for J2SE servers.

The predefined workspace contains the following items:

- Situation Event Console report, which shows the event activity for situations associated with the current Navigator item. The Navigator alerts you when a situation becomes true by overlaying the Navigator item with an event indicator. This report is useful when multiple alerts are raised and you might not know newly arrived alerts just by looking at the indicator.
- DC Message Events report, which displays the messages generated by the ITCAM for J2EE data collector and the related information of the messages. This information includes message identifier, sequence number, and the component from which the messages were generated.

Accessing the DC Message Events workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the J2SE application server of your choice.
5. Within the list of available J2SE application server workspaces on that server, select the **DC Message Events** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces
- "Situations for ITCAM Agent for J2EE" on page 528

EJB Components workspace

This workspace displays runtime information for an EJB component in the Oracle/BEA WebLogic Server.

This workspace displays data provided by the "Enterprise Java Bean Components - WebLogic attributes" on page 474.

The predefined workspace contains the following items:

- Activated EJBs bar chart, which displays the number of activated EJBs
- EJB Components report, which displays runtime information for an EJB component

Accessing the EJB Components workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the Oracle/BEA WebLogic application server entry.

5. Within the list of available J2EE application server workspaces on the Oracle/BEA WebLogic server, select the **EJB Components** entry.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Enterprise Java Beans workspace

This workspace reports information about each Enterprise Java Bean (EJB) defined for an EJB module. The workspace provides information about these beans regarding their identity, instrumentation level settings, creation and destruction of bean objects, response times, invocations, calls, and rates for retrievals, returns, and discards.

For JBoss and Oracle application servers, this workspace displays data provided by the "Enterprise Java Bean Modules - J2EE attributes" on page 475.

The predefined workspace contains the following items:
- Message Driven Beans report, which displays performance statistics for message driven beans in the given EJB module
- Entity Beans report, which displays performance statistics for entity beans in the given EJB module
- Stateful Session Beans report, which displays performance statistics for stateful session beans in the given EJB module
- Stateless Session Beans report, which displays performance statistics for stateless session beans in the given EJB module

Accessing the Enterprise Java Beans - JBoss and Oracle application servers workspace

You access this workspace from the "EJB Modules workspace" on page 432. To list the EJBs, use one of the following procedures:
- From the primary Tivoli Enterprise Portal menu, select **View** ->**Workspace > Enterprise Java Beans**.
- In the Navigator, right-click the **EJB Modules** entry and select **Workspace> Enterprise Java Beans**.

To see the EJBs referenced by a specific EJB module, from the EJB modules report, right-click the link icon and select **Enterprise Java Beans**.

Enterprise Java Beans - NetWeaver workspace

In SAP NetWeaver server, this workspace displays data provided by the "Enterprise Java Bean Service - NetWeaver attributes" on page 477.

The predefined workspace contains the following items:
- Highest Creation Counts bar chart, which displays the highest count of times of a "create" method was invoked on the bean
- Most Active Session timeouts, which display the most timeout for the active sessions. If a session stays idle and not passivated for this long, it is removed
- Enterprise Java Beans report, which displays information about each Enterprise Java Bean (EJB)

Accessing the Enterprise Java Beans - NetWeaver workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the SAP NetWeaver application server entry of your choice.
5. Within list of available J2EE application server workspaces on the SAP NetWeaver server, click the **Enterprise Java Beans** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

EJB Modules workspace

This workspace displays aggregated information about each defined EJB. It displays aggregated bean performance data for all Enterprise beans deployed to an EJB module. It also displays aggregated information for the application server that aggregates bean performance data for all Enterprise beans deployed to the application server.

This workspace displays data provided by the "Enterprise Java Bean Modules - J2EE attributes" on page 475.

Note to OracleAS9 users: This workspace is not supported on OracleAS9 and no data is provided, hence this workspace is always empty.

The predefined workspace contains the following items:

- Highest Creation Count bar chart, which displays the largest number of times that beans were created during the interval
- EJB Modules report, which displays aggregated information for each defined EJB module that aggregates bean performance data for all Enterprise beans deployed to that module. The report also displays aggregated information for the application server that aggregates bean performance data for all Enterprise beans deployed to the application server

Accessing the EJB Modules workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the J2EE application server entry of your choice.
5. Within the list of available J2EE application server workspaces on that server, select **EJB Modules**.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

EJBs - Selected Enterprise Application workspace

This workspace displays resource statistics for selected EJB module. It displays performance statistics about individual EJBs deployed to the J2EE application.

This workspace displays data provided by the Enterprise Java Bean Components - WebLogic attributes.

The predefined workspace contains the following items:

- Highest Activation Rates bar chart, which displays the highest number of beans from this EJB Home that have been activated per second for the interval since the previous sample
- EJBs - Selected Enterprise Application report, which displays resource statistics for selected EJB module.

Accessing the EJBs - Selected Enterprise Application workspace

This workspace is accessed from the EJB Components workspace. To list the EJBs, use one of the following procedures:

- From the primary Tivoli Enterprise Portal menu, open the **View** menu, then click **Workspace > EJBs - Selected Enterprise Application**.
- Within the Navigator, right-click the **EJB Components** entry and select **Workspace> EJBs - Selected Enterprise Application**.
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Garbage Collection Analysis workspace

This workspace summarizes all the Java Virtual Machine garbage-collector activity over a user-defined interval. The JVM generates detailed garbage collection logs for an application server when started with the verbose:gc runtime parameter.

This workspace displays data provided by the Garbage Collection Analysis attributes.

The predefined workspace contains the following items:

- Garbage Collection Rate - History graph, which displays the rate at which the garbage-collection algorithm is being invoked
- Heap Usage - History bar chart, which displays the high water mark of free storage (in kilobytes) available in the heap after each garbage-collector run
- Percentage of Time Garbage Collector Running - History graph, which displays the percentage of real time the garbage collector was running during the current interval, for each server region
- Garbage Collection Analysis report, which displays information about the garbage-collection activities within the Java Virtual Machine that is hosting the application server. For example, this report displays the number of times the collector ran during the interval and the resulting number of objects that the collector freed

Accessing the Garbage Collection Analysis workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the J2EE application server of your choice.
5. Within the list of available J2EE application server workspaces on that server, click the **Garbage Collection Analysis** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Garbage Collections - Selected Allocation Failure workspace

This workspace provides detailed information about the garbage-collection cycles that occurred in response to a specific heap-allocation failure that occurred within the Java Virtual Machine.

This workspace displays data provided by the Garbage Collection Cycle attributes .

Note to Solaris and HP-UX users: Allocation-failure information is not recorded on these platforms; hence this workspace is always empty.

The predefined workspace contains the following items:

- GC Elapsed Times bar chart, which breaks down the mark, sweep, and compact times (in milliseconds) for each garbage-collection cycle that occurred for the selected allocation failure
- Heap Usage bar chart, which displays the JVM heap usage (kilobytes in use, freed, and free at start of garbage collection) for each garbage-collection cycle
- Garbage Collections - Selected Allocation Failure report, which displays information about a single garbage-collection cycle that the Java Virtual Machine hosting the application server performed. For example, this report displays the free heap space both before and after garbage collection, the heap space freed, and the number of objects moved during garbage collection

Accessing the Garbage Collections - Selected Allocation Failure workspace

To access this workspace from the "Allocation Failures workspace" on page 424, use one of the following procedures:

- From the Allocation Failures report, right-click the link icon, and select **Garbage Collections - Selected Allocation Failure**.
- From the Allocation Failure Elapsed Times bar chart or the Heap Usage - History bar chart, right-click any bar and select **Link To -> Garbage Collections - Selected Allocation Failure**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

J2EE Agent workspace

This workspace displays product events that affect the ability of the J2EE Application Server agent to collect data. This workspace displays events occurring within the J2EE Application Server agent and J2EE application servers that are installed on the host computer. It also displays the status of the Tivoli Enterprise Monitoring Agent.

The predefined workspace contains the following items:

- J2EE Agent Events report, which displays information about agent-level events that affect the ability of the Tivoli Enterprise Monitoring Agent to collect data for the J2EE application server. You can use this view to see exception and error messages, their IDs, and their severity.

  Agent Events report also shows the result of issuing a Take Action command. Place your cursor over a truncated message to display the text of the complete message.

  This report displays data reported by the "J2EE Agent Events attributes" on page 486.
- Application Servers Summary report displays information about status of the J2EE server.

  This report displays data reported by the Application Server Status attributes .

Accessing the J2EE Agent workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of available Tivoli Enterprise Monitoring Agents on that node, click the **J2EE Agent** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces
- "Situations for ITCAM Agent for J2EE" on page 528

J2SE Application workspace

This workspace displays overall statistics for each application server being monitored by the Tivoli Enterprise Monitoring Agent.

The predefined workspace contains the following items:

- Heap Usage - History bar chart, which displays free memory size and used memory size (in kilo bytes) within the J2SE Application Server heap over time. The hover help associated with the chart displays the exact values

  This view displays data provided by the Garbage Collection Analysis attributes .
- Response Time - History graph, which shows the server response time to requests over time

  This view displays data provided by the Request Times and Rates attributes .
- Request Rate - History graph, which shows the rate at which requests have been received by this server over time

  This view displays data provided by the Request Times and Rates attributes .

- Percent CPU Used - History graph, which shows the percentage of the CPU that this server consumed over time

  This view displays data provided by the Application Server attributes .
- Application Server Summary report, which displays overall information about this J2SE Application Server, including JVM statistics and CPU usage statistics

  This view displays data provided by the Application Server attributes .

Accessing J2SE Application Workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications on that node, expand the list of J2EE agents.
4. Within the list of available agents, click the **J2SE Application** entry of your choice.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

JBoss App Server workspace

This workspace displays overall statistics for each application server being monitored by the Tivoli Enterprise Monitoring Agent.

The predefined workspace contains the following items:

- Heap Usage - History bar chart, which displays free memory size and used memory size (in kilo bytes) within the J2EE Application Server heap over time. The hover help associated with the chart displays the exact values

  This view displays data provided by the Garbage Collection Analysis attributes .
- Response Time - History graph, which shows the server response time to requests over a time period

  This view displays data provided by the Request Times and Rates attributes .
- Request Rate - History graph, which shows the rate at which requests have been received by this server over a time period

  This view displays data provided by the Request Times and Rates attributes .
- Percent CPU Used - History graph, which shows the percentage of the CPU that this server consumed over a time period

  This view displays data provided by the Application Server attributes .
- Application Server Summary report, which displays overall information about this JBoss application server, including JVM statistics and CPU usage statistics

  This view displays data provided by the Application Server attributes .

Accessing the JBoss App Server workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.

3. Within the list of monitored applications on that node, expand the list of J2EE agents.
4. Within the list of available agents, select the **JBoss App Server** entry of your choice.

For additional information, see:

- "Organization of the predefined workspaces" on page 415
- "Attribute groups used by the predefined workspaces" on page 456

JCA Connection Pools workspace

This workspace displays information about resource adapters and connectors that adhere to JCA, the J2EE Connector Architecture (JCA).

In JBoss Application Server, this workspace displays data provided by the "JCA Connection Pools - J2EE attributes" on page 489.

The predefined workspace contains the following items:

- Highest Pool Usage bar chart, which shows the largest pool usage for each JCA connection pool. The Y-axis headings correspond to the row number of the JCA Connection Pools report
- Worst Wait Times bar chart, which shows the worst wait time (in milliseconds) for each of the JCA connection pools. The Y-axis headings correspond to the row number of the JCA Connection Pools report
- Worst Use Times bar chart, which shows the worst use time (in milliseconds) for each of the JCA connection pools. The Y-axis headings correspond to the row number of the JCA Connection Pools report
- JCA Connection Pools report, which displays information about the JCA connection pool for each Connection Factory

In the Oracle/BEA WebLogic Application Server, this workspace displays data provided by the "J2EE Connector Connection Pools - WebLogic attributes" on page 487.

The predefined workspace contains the following items:

- Highest Active Connections bar chart, which shows the current highest active connections.
- Worst Connection Rejection Rates, which shows the worst connection rejection rates (in milliseconds) for each JCA connection pools.
- JCA Connection Pools report, which displays information about the JCA connection pool for each Connection Factory

Accessing the JCA Connection Pools workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications on that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the J2EE application server of your choice.

5. Within the list of available J2EE application server workspaces in that server, select the **JCA Connection Pools** entry.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

JDBC Connection Pools workspace

This workspace provides usage information about the JDBC connection pools for a database in the Oracle/BEA WebLogic Server.

This workspace displays data provided by the "JDBC Connection Pools - WebLogic attributes" on page 491.

The predefined workspaces contains the following items:
- Highest Active Connections bar chart, which shows the current highest active connections
- Worst Wait Times bar chart, which shows the worst wait times (in milliseconds) for each database connection pool
- DB Connection Pools report, which displays information about the database connection pool for each defined data source, and an aggregated value that aggregates over all data sources. For example, this report displays the number of threads waiting for a connection and the number of connections created and released

Accessing the JDBC Connection Pools workspace

To access this workspace, complete the following steps:
1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the Oracle/BEA WebLogic application server entry.
5. Within the list of available J2EE application server workspaces on the Oracle/BEA WebLogic server, click the **JDBC Connection Pools** entry.

Selected JDBC Connection Pool - History workspace

This workspace displays the historical information that corresponds to the information in the JDBC Connection Pools workspace for a selected connection pool. Historical information is collected over a particular measured time span. See the online help for Tivoli Enterprise Portal for a detailed explanation of historical reporting.

The predefined workspace contains the following items:
- Active and Available Connections - History table, which displays the history of active and available connections.
- Highest Wait Times - History table, which displays the history of the highest wait times (in milliseconds) for each database connection pool.
- Selected JDBC Connection Pool - History report, which displays historical data and statistics in the JDBC connection pools for a selected connection pool.

Accessing the Selected JDBC Connection Pool - History workspace

To access this workspace from the DC Connection Pools workspace, use one of the following procedures:

- From the JDBC Connection Pools report, right-click the link icon, and from the menu, click **Selected JDBC Connection Pool - History**.
- From the Highest Active Connection bar chart, the Worst Wait Times bar chart, right-click any bar, and select **Link To -> Selected JDBC Connection Pool - History**.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

JMS Sessions workspace

This workspace displays statistics for Java Message Service (JMS) sessions in Oracle/BEA WebLogic Server.

In Oracle/BEA WebLogic Server, the workspace displays data provided by the "JMS Sessions - WebLogic attributes" on page 499.

The predefined workspace contains the following items:

- Most Messages Sent bar chart, which displays the largest number of messages sent
- Most Messages Received bar chart, which displays the largest number of messages received
- JMS Sessions report, which displays statistics for JMS sessions
- Message Producers report, which displays information about message producers
- Message Consumers report, which displays information about message consumers

Accessing the JMS Sessions workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the Oracle/BEA WebLogic application server.
5. Within the list of available J2EE application workspaces on that server, click the **JMS Sessions** entry.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

JMS Summary workspace

The JMS Summary workspace displays information about queues being used by your applications via the JMS interface and about how J2EE Application Server

applications are using J2EE MQ. It displays such information as the number of messages read and written and which queue managers and queues were used during the interval.

This workspace displays data provided by the JMS Summary attributes .

The predefined workspace contains the following items:

- Worst JMS Send Times bar chart, which displays the longest times (in milliseconds) that your application spent putting messages into a queue during the interval
- Worst JMS Receive Times bar chart, which displays the longest times (in milliseconds) that your application spent getting messages from a queue during the interval
- Worst JMS Browse Times bar chart, which displays the longest times (in milliseconds) that your application spent browsing messages on a queue during the interval
- JMS Summary - Current Interval report, which displays detailed information about the send, receive, browse, and publish times for the messaging middleware (J2EE MQ) by your J2EE Application Server applications using JMS. It includes about the queue managers and queues that are being used and how many messages are being read and written

Accessing the JMS Summary workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the J2EE application server of your choice.
5. Within the list of available J2EE application server workspaces on that server, click the **JMS Summary** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

JTA Resources workspace

This workspace displays information about the Java Transaction API (JTA) resources.

This workspace displays data provided by the "JTA Resources - J2EE attributes" on page 506 for JBoss and Oracle application servers. For WebLogic application server, this workspace displays data provided by "Java Transaction Service - WebLogic attributes" on page 503.

The predefined workspace contains the following items:

- Active Transactions bar chart, which shows the number of active transactions
- JTA Resources report, which displays information about the JTA resources

Accessing the JTA Resources workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the J2EE application server of your choice.
5. Within the list of available J2EE application server workspaces on that server, click the **JTA Resources** entry.

For additional information, see:

- "Organization of the predefined workspaces" on page 415
- "Attribute groups used by the predefined workspaces" on page 456

JTA Summary workspace

This workspace displays the performance summary statistics information about transactions in SAP NetWeaver application server.

This workspace displays data provided by "JTA Summary - NetWeaver attributes" on page 507.

The predefined workspace contains the following items:

- Transactions - History graph, which shows the history of transactions
- Transaction Service report, which displays performance data of the Transaction Service

Accessing the JTA Summary workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the SAP NetWeaver application server entry of your choice.
5. Within the list of available J2EE application server workspaces on the SAP NetWeaver server, click the **JTA Summary** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

JVM Statistics workspace

This workspace reports the detailed statistics of the operating system on which the J2SE application server is running and the Java Virtual Machine (JVM) information.

This workspace displays data provided by "JDK - Operation System attributes" on page 493,"JDK - Memory attributes" on page 495"JDK - JVM attributes" on page 496 and "JDK - Threading attributes" on page 498.

The predefined workspace contains the following items:

- Memory Usage - History graph, which displays the amount of used heap memory and non-heap memory (in kilobytes) in the JVM over time
- Pending Objects - History graph, which displays the number of objects that are not finalized
- Heap Sizes - History graph, which displays the maximum heap memory size and non-heap memory size (in kilobytes) in the JVM over time
- Threads - History graph, which displays the information about threads, such as peak threads and daemon threads
- JVM Statistics report, which shows the overall JVM information that the current J2SE application server uses, such as JVM name, version, and vendor
- Operating System report, which shows the overall information about the operating system on which the J2SE application server is running

Accessing the JVM Statistics workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the J2SE Application entry of your choice.
5. Within the list of available workspaces on the J2SE Application, click the **JVM Statistics** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Log Analysis workspace

This workspace reports application server error and exception conditions as recorded in the application server log file.

This workspace displays data provided by the Log Analysis attributes .

The predefined workspace contains the following items:

- DC Message Events report, which displays information about the data collector Messages

  This report displays data reported by the "DC Messages - J2EE attributes" on page 473.
- Log Analysis report, which displays application server error and exception conditions as recorded in the application server log file. This information includes the exception severity as well as the ID and text of the associated message

Accessing the Log Analysis workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the J2EE application server of your choice.
5. Within the list of available J2EE application server workspaces in that server, click the **Log Analysis** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces
- "Situations for ITCAM Agent for J2EE" on page 528

Oracle App Server workspace

This workspace displays overall statistics for each application server being monitored by the Tivoli Enterprise Monitoring Agent.

The predefined workspace contains the following items:

- Heap Usage - History bar chart, which displays free memory size and used memory size (in kilobytes) within the J2EE Application Server heap over time. The hover help associated with the chart displays the exact values

  This view displays data provided by the Garbage Collection Analysis attributes .
- Response Time - History graph, which shows the server response time to requests over time

  This view displays data provided by the Request Times and Rates attributes .
- Request Rate - History graph, which shows the rate at which requests have been received by this server over time

  This view displays data provided by the Request Times and Rates attributes .
- Percent CPU Used - History graph, which shows the percentage of the CPU that this server consumed over time

  This view displays data provided by the Application Server attributes .
- Application Server Summary report, which displays overall information about this Oracle Application Server, including JVM statistics and CPU usage statistics

  This view displays data provided by the Application Server attributes .

Accessing Oracle App Server Workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, click the **Oracle App Server** entry of your choice.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Request Analysis workspace

The workspace reports response times and functional decomposition information about requests (including servlets, JSPs, and EJB methods) that completed during the interval. A historical version of this workspace provides a long-term view of a single request that you select.

This workspace displays data provided by the Request Analysis attributes .

The predefined workspace contains the following items:
- Worst Response Times bar chart, which displays the five worst response times for requests processed during the current interval
- Worst Completion Rates bar chart, which displays the 10 requests that have the worst completion rates
- Requests - Current Interval report, which displays detailed information about the response times recorded for each request

Accessing the Request Analysis workspace

To access this workspace, complete the following steps:
1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the J2EE application server of your choice.
5. Within the list of available J2EE application server workspaces on that server, select the **Request Analysis** entry.

Selected Request - History workspace

The Selected Request - History workspace displays the historical information that corresponds to the information in the Request Analysis workspace for a single request type that you select. Historical information is collected over a specific time span. See the online help for Tivoli Enterprise Portal for a detailed explanation of historical reporting.

Accessing the Selected Request - History workspace

To access this workspace from the Request Analysis workspace, use one of the following procedures:
- From the Requests - Current Interval report, right-click the link icon, then from the menu, click **Selected Request - History**.
- From the Worst Response Times bar chart, right-click any bar, then from the menu, click **Link To > Selected Request - History**.

For additional information, see:
- Organization of the predefined workspaces

- Attribute groups used by the predefined workspaces

Selected Request - Baseline workspace

This workspace displays aggregated information about the request baseline. The baselining collects statistical information about an application requests completion times and uses this information to assign fair and bad thresholds on the application requests. The product divides the whole request response times into buckets and collects individual hits into each bucket. Use these attributes to get statistics from individual requests collected during baselining interval.

This workspace displays data provided by the Baseline attributes.

The predefined workspace contains:

- Baseline Data report, which shows lower and upper boundaries for each bucket request as well as the breakdown of nested request types in percentage.
- Request Label report, which shows the monitoring configuration settings for selected requests, including auto-threshold settings and actual thresholds calculated from the baseline data.
- Nested Delays Distribution bar chart, which displays a bar for each bucket of response times across the different nested types (JDBC, JCA, JMS, and so on.). This chart provides you with additional hints and insight about how to interpret response times distribution displayed in the distribution chart.
- Response Time Distribution bar chart, which displays the distribution of the servlet response times on the baselining interval, also called zones.

Accessing the Selected Request - Baseline workspace

To access this workspace from the Application Registry workspace, use the following procedure:

- From the Application Configurations report, right-click the link icon to the left of any row and select **Selected Request - Baseline**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Application - Application Tier Analysis workspace

The workspace displays detailed information about application tier health for a selected J2EE application.

The application tier health is derived from the following performance statistics:

- Calculated application request delays in EJB container or custom requests delays compared against corresponding thresholds assigned in application configuration.
- Completion rates for application edge EJB requests.
- Application server ORB thread pool utilization level.

This workspace displays data provided by the Application Health Status attributes.

The predefined workspace contains:

- Application Tier Analysis report, which shows the overall health status of the Application tier for a selected application.

- Worst Application Tier Delays - Top 10 bar chart, which displays the top 10 delayed requests in the application tier. This view displays data provided by the Request Analysis attributes.
- Worst Application Tier Completion Rates - Top 10 bar chart, which displays the top 10 worst requests in the application tier. This view displays data provided by the Request Analysis attributes.
- JVM Health - CPU Used % graph, which displays the percentage of the CPU used by the Java Virtual Machine (JVM) during the interval. This view displays data provided by the Application Server attributes.
- JVM Health - Heap Used % graph, which displays the current heap usage for the monitored JVM. This view displays data provided by the Garbage Collection Analysisattributes.
- JVM Health - GC Time % graph, which displays the percentage of real time that the garbage collector was active during the interval. This view displays data provided by the Garbage Collection Analysis attributes.

Accessing the Selected Application - Application Tier Analysis workspace

To access this workspace from the Application Health Summary workspace, use the following procedures:

- From the Application Health Summary report, right-click the link icon and select **Selected Application - Application Tier Analysis**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Application - Configuration workspace

This workspace displays the information about the configuration details of the selected application. The workspace contains information about application requests and the corresponding thresholds assigned to them, and information about status and configuration for application baseline activity. An entry is created for each application in the configuration report when a J2EE application is discovered by the monitoring agent. The data is also stored in a context file local to the monitoring agent where it can persist between monitoring agent restarts.

This workspace displays data provided by the Application Monitoring Configuration attributes.

The predefined workspace contains:

- Longest Request Thresholds - Top 10 bar chart, which displays the 10 longest (in time) request thresholds configured for the given application (Servlet/JSP URL or EJB class/method call).
- Application Requests report, which shows the discovered application requests and thresholds assigned to them.
- Application report, which shows the common details about application configuration, including custom requests monitoring levels for application and current baseline status.

Accessing the Selected Application - Configuration workspace

Use the following steps to access this workspace.

1. Click **Application Health Summary > Application Health Summary Report**.
2. Right-click the link icon and select **Selected Application - Configuration**

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Application - Backend Tier Analysis workspace

This workspace displays information about the details of the Backend tier for a selected application.

This workspace displays data provided by the Application Health Status attributes.

The predefined workspace contains:

- Backend Tier Analysis report, which shows the overall health status of the backend tier for a selected application.
- Worst Backend Tier Delays - Top 10 bar chart, which displays the top 10 delayed requests in the backend tier. This view displays data provided by the Request Analysis attributes.
- Most Used Data sources - Top 10 bar chart, which displays the average time per request used by queries and updates to the data source. This view displays data provided by the Datasources attributes.
- Most Used JMS Resources - Top 10 bar chart, which displays the longest times your application spent in getting messages from a queue, putting messages onto a queue, publishing messages to a queue, or browsing messages on a queue during the interval. This view displays data provided by the JMS Summary attributes.
- JVM Health - CPU Used % graph, which displays the percentage of the CPU used by the Java Virtual Machine (JVM) during the interval. This view displays data provided by the Application Server attributes.
- JVM Health - Heap Used % graph, which displays the current heap usage for the monitored JVM. This view displays data provided by the Garbage Collection Analysis attributes.
- JVM Health - GC Time % graph, which displays the percentage of real time that the garbage collector was active during the interval. This view displays data provided by the Garbage Collection Analysis attributes.

Accessing the Selected Application - Backend Tier Analysis workspace

To access this workspace from the Application Health Summary workspace, use the following procedures:

- From the Application Health Summary report, right-click the link icon and, from the menu, click **Selected Application - Backend Tier Analysis**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Application - Health History workspace

The workspace displays the information about the historical health status of a selected application. By default, the history data is collected for the last 24 hours.

This workspace displays data provided by the Application Health Status attributes.

The predefined workspace contains:

- Availability/Throughput - History graph, which displays average request processing rate by application over the time. This view displays data provided by the Request Times and Rates attributes.
- Availability/Completion Rate - History graph, which displays the average request completion rate by application over the time. Completion rate is defined as the ratio of successfully completed requests count to the total count of requests processed by application on the interval. This view displays data provided by the Request Times and Rates attributes.
- Availability/Average Load- History graph, which displays the average number of concurrent application requests over the time. This view displays data provided by the Request Times and Rates attributes.
- Response Time - History graph, which displays the average application response time over the time. This view displays data provided by the Request Times and Rates attributes.
- Server Resources/CPU Used - History graph, which displays the percent of CPU time used by the application JVM process over the time. This view displays data provided by the Application Server attributes.
- Server Resources/Paging Rate - History graph, which displays the system paging rate in kilobytes per second over the time. This view displays data provided by the Application Server attributes.
- Server Resources/GC Active Time - History graph, which displays the percentage of total CPU time for which the garbage collector was active over the time. This view displays data provided by the Garbage Collection Analysis attributes.

Accessing the Selected Application - Health History workspace

To access this workspace from the Application Health Summary workspace, use the following procedures:

- From the Application Health Summary report, right-click the link icon and select **Selected Application - Health History**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Application - Client Tier Analysis workspace

This workspace displays detailed information about the client tier health for a selected J2EE application.

The client tier health indicator is derived from the following performance statistics:

- Calculated application request delays inside Servlet/JSP or Portal container compared against corresponding thresholds assigned in application configuration.
- Completion rates for edge Servlet/JSP and Portal application requests.

This workspace displays data provided by the Application Health Status attributes.

The predefined workspace contains:

- Client Tier Analysis report, which shows the overall health status of application execution in web or portal containers.
- Worst Client Tier Delays - Top 10 bar chart, which displays the top 10 requests with biggest delays (threshold violations) in the client tier. This view displays data provided by the Request Analysis attributes.
- Worst Client Tier Completion Rates - Top 10 bar chart, which displays the top 10 Servlet/JSP/Portal edge requests with the worst completion rates. This view displays data provided by the Request Analysis attributes.
- JVM Health - CPU Used % graph, which displays the percentage of the CPU used by the Java Virtual Machine (JVM) during the interval. This view displays data provided by the Application Server attributes.
- JVM Health - Heap Used % graph, which displays the current heap usage for the monitored JVM. This view displays data provided by the Garbage Collection Analysis attributes.
- JVM Health - GC Time % graph, which displays the percentage of real time that the garbage collector was active during the interval. This view displays data provided by the Garbage Collection Analysis attributes.

Accessing the Selected Application - Client Tier Analysis workspace

To access this workspace from the Application Health Summary workspace, use the following procedures:

- From the Application Health Summary report, right-click the link icon to the left of any row and select **Selected Application - Client Tier Analysis**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Request - data sources workspace

The Selected Request - data sources workspace displays information about JDBC activity performed by the request you selected in the primary Request Analysis workspace.

This workspace displays data provided by the Selected Request attributes .

The predefined workspace contains the following items:

- Worst Data Sources Response Times bar chart, which shows the worst response times (in milliseconds) for data sources accessed by this request
- Selected Request - Data sources report, which displays detailed information about the data sources accessed for the selected request

Accessing the Selected Request - data sources workspace

To access this workspace from the "Request Analysis workspace" on page 444, use one of the following procedures:

- From the Requests - Current Interval report, right-click the link icon, and select **Selected Request - Datasources**.

- From Worst Average Response Times bar chart, right-click any bar and select **Link To > Selected Request - Datasources**.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Request - JMS Queues workspace

The Selected Request - JMS Queues workspace displays information about message queues owned by messaging middleware and accessed by the request that you selected in the primary Request Analysis workspace.

This workspace displays data provided by the Selected Request attributes .

The predefined workspace contains the following items:
- Worst JMS Queues Response Times bar chart, which shows the worst response times (in milliseconds) for JMS resources accessed by this request
- Selected Request - JMS Queues report, which displays detailed information about the JMS resources accessed by the selected request

Accessing the Selected Request - JMS Queues workspace

To access this workspace from the Request Analysis workspace , use one of the following procedures:
- From the Requests - Current Interval report, right-click the link icon, and select **Selected Request - JMS Queues**.
- From Worst Average Response Times bar chart, right-click any bar and select **Link To > Selected Request - JMS Queues**.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Request - Resource Adapters workspace

The Selected Request - Resource Adapters workspace displays response-time information about the JCA resources adapters referenced by the request you selected in the primary Request Analysis workspace.

This workspace displays data provided by the Selected Request attributes .

The predefined workspace contains the following items:
- Worst Resource Adapter Response Times bar chart, which shows the worst-performing JCA resource adapter nested requests, in milliseconds
- Selected Request - Resource Adapters report, which displays detailed information about each JCA resource adapter that was accessed by the selected request

Accessing the Selected Request - Resource Adapter

To access this workspace from the "Request Analysis workspace" on page 444, use one of the following procedures:
- From the Requests - Current Interval report, right-click the link icon, and select **Selected Request - Resource Adapters**.

- From Worst Average Response Times bar chart, right-click any bar and select **Link To > Selected Request - Resource Adapters**.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

SAP NetWeaver Server workspace

This workspace displays overall statistics for each application server being monitored by the Tivoli Enterprise Monitoring Agent.

The predefined workspace contains the following items:

- Heap Usage - History bar chart, which displays free memory size and used memory size (in kilobytes) within the J2EE Application Server heap over time. The hover help associated with the chart displays the exact values

  This view displays data provided by the Garbage Collection Analysis attributes .
- Response Time - History graph, which shows the server response time to requests over time

  This view displays data provided by the Request Times and Rates attributes .
- Request Rate - History graph, which shows the rate at which requests have been received by this server over time

  This view displays data provided by the Request Times and Rates attributes .
- Percent CPU Used - History graph, which shows the percentage of the CPU that this server consumed over time

  This view displays data provided by the Application Server attributes .
- Application Server Summary report, which displays overall information about this SAP NetWeaver Server, including JVM statistics and CPU usage statistics

  This view displays data provided by the Application Server attributes .

Accessing SAP NetWeaver Server workspace

To access this workspace, complete the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, click the **SAP NetWeaver Server** entry of your choice.

For additional information, see:
- "Organization of the predefined workspaces" on page 415
- "Attribute groups used by the predefined workspaces" on page 456

Servlets/JSPs - Selected Enterprise Application workspace

This workspace displays performance statistics for Servlets/JSPs running in the given Enterprise Application.

This workspace displays data provided by the "Servlets and JSPs - WebLogic attributes" on page 523.

The predefined workspace contains the following items:

- Worst Execution Times bar chart, which displays the worst amount of time the invocations of the servlet have executed for the interval since the previous sample
- Servlets/JSPs - Selected Enterprise Application report, which displays performance information for servlets and JavaServer pages

Accessing the Servlets/JSPs - Selected Enterprise Application workspace

To access this workspace from the"Web Applications workspace" on page 453 in BEA WebLogic application server, use one of the following procedures:

- From the web Applications report, right-click the link icon, and select **Servlets/JSPs - Selected Enterprise Application**.
- From the Worst Response Times bar chart, the Most Popular web Applications bar chart, the Worst Error Rates bar chart, or the Worst Execution Time bar chart, right-click any bar and select **Link To > Servlets/JSPs - Selected Enterprise Application**.

For additional information, see:

- "Organization of the predefined workspaces" on page 415
- "Attribute groups used by the predefined workspaces" on page 456

Servlets/JSPs - Selected Web Application workspace

This workspace displays statistical data regarding the servlets and JSPs invoked by a single web application.

This workspace displays data provided by the "Servlets JSPs - J2EE attributes" on page 521.

The predefined workspace contains the following items:

- Worst Response Times bar chart, which displays the worst average response times (in milliseconds) for servlets invoked by the selected web application
- Servlets/JSPs - Selected Web Application report, which displays performance information about the servlets and JSPs invoked by the application. For example, this report displays the average number of concurrent requests for a servlet and the time it takes a servlet to respond to a request

Accessing the Servlets/JSPs - Selected Web Application workspace

To access this workspace from the "Web Applications workspace" on page 453, use one of the following procedures:

- From the Web Applications report, right-click the link icon, and select **Servlets/JSPs - Selected Web Application**.
- From the Worst Response Times bar chart, the Most Popular Web Applications bar chart, the Worst Error Rates bar chart, or the Worst Execution Time bar chart, right-click any bar and select **Link To -> Servlets/JSPs - Selected Web Application**.

For additional information, see:

- "Organization of the predefined workspaces" on page 415
- "Attribute groups used by the predefined workspaces" on page 456

Tomcat Server workspace

This workspace displays overall statistics for each application server being monitored by the Tivoli Enterprise Monitoring Agent.

The predefined workspace contains the following items:

- Heap Usage - History bar chart, which displays free memory size and used memory size (in kilo bytes) within the J2EE Application Server heap over time. The hover help associated with the chart displays the exact values

  This view displays data provided by the Garbage Collection Analysis attributes .
- Response Time - History graph, which shows the server response time to requests over time

  This view displays data provided by the Request Times and Rates attributes .
- Request Rate - History graph, which shows the rate at which requests have been received by this server over time

  This view displays data provided by the Request Times and Rates attributes .
- Percent CPU Used - History graph, which shows the percentage of the CPU that this server consumed over time

  This view displays data provided by the Application Server attributes .
- Application Server Summary report, which displays overall information about this Tomcat server, including JVM statistics and CPU usage statistics

  This view displays data provided by the Application Server attributes .

Accessing Tomcat Server Workspace

To access this workspace, perform the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, click the **Tomcat Server** entry of your choice.

For additional information, see:

- "Organization of the predefined workspaces" on page 415
- "Attribute groups used by the predefined workspaces" on page 456

Web Applications workspace

This workspace displays information about the web applications running in J2EE application servers.

Note to OracleAS9 users: This workspace is not supported on OracleAS9 and no data is provided, hence this workspace is always empty.

This workspace displays data provided by the "Web Applications - J2EE attributes" on page 525.

The predefined workspace contains the following items:

- Worse Response Times bar chart, which shows the worst servlet response times (in milliseconds) during the interval
- Most Popular Web Applications bar chart, which shows the servlet exception and request rates (in events per second)

- Web Applications report, which displays aggregated performance data for each web application about all servlets and JSPs deployed to that web application, including response and error rates and response times

In the BEA WebLogic Application Server, this workspace displays data provided by the "Web Applications - WebLogic attributes" on page 527.

The predefined workspace contains the following items:

- Most Active Sessions bar chart, which shows the high water mark of the total number of open sessions in this server
- Most Popular Web Applications bar chart, which shows the servlet exception and request rates (in events per second)
- Web Applications report, which displays aggregated performance data for each web application about all servlets and JSPs deployed to that web application, including response and error rates and response times

Accessing the Web Applications workspace

To access this workspace, perform the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the J2EE application server of your choice.
5. Within the list of available J2EE application server workspaces on that server, click the **Web Applications** entry.

For additional information, see:

- "Organization of the predefined workspaces" on page 415
- "Attribute groups used by the predefined workspaces" on page 456

Web Container workspace

This workspace displays summary statistics about servlets/JSPs invocations in SAP NetWeaver Web Container.

This workspace displays data provided by the "Web Container - NetWeaver attributes" on page 524.

The predefined workspace contains the following items:

- Security Sessions bar chart, which displays the number of current valid, invalid, and also timed out security sessions
- Http Sessions bar chart, which displays the number of current valid, invalid and also timed out http sessions
- Servlets/JSPs report, which displays performance information about the servlets and JSPs invoked by the application

Accessing the Web Container workspace

To access this workspace, perform the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, expand the SAP NetWeaver application server.
5. Within the list of available J2EE application server workspaces on the SAP NetWeaver server, click the **Web Container** entry.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

WebSphere App Server CE workspace

This workspace displays overall statistics for each application server being monitored by the Tivoli Enterprise Monitoring Agent.

The predefined workspace contains the following items:

- Heap Usage - History bar chart, which displays free memory size and used memory size (in kilo bytes) within the J2EE Application Server heap over time. The hover help associated with the chart displays the exact values

  This view displays data provided by the Garbage Collection Analysis attributes .
- Response Time - History graph, which shows the server response time to requests over time

  This view displays data provided by the Request Times and Rates attributes .
- Request Rate - History graph, which shows the rate at which requests have been received by this server over time

  This view displays data provided by the Request Times and Rates attributes .
- Percent CPU Used - History graph, which shows the percentage of the CPU that this server consumed over time

  This view displays data provided by the Application Server attributes .
- Application Server Summary report, which displays overall information about this WebSphere App Server CE application server, including JVM statistics and CPU usage statistics

  This view displays data provided by the Application Server attributes .

Accessing WebSphere App Server CE workspace

To access this workspace, perform the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications associated with that node, expand the list of J2EE agents.
4. Within the list of available agents, click the **WebSphere App Server CE** entry of your choice.

For additional information, see:
- "Organization of the predefined workspaces" on page 415
- "Attribute groups used by the predefined workspaces" on page 456

Attributes for ITCAM Agent for J2EE

IBM Tivoli Composite Application Manager for Application Diagnostics Agent for J2EE is a Tivoli Enterprise Management Agent that is located within your distributed system. This agent gathers data about running J2EE Application Server processes that have been collected and stored by the ITCAM for J2EE data collector, and stores this data in elements called attributes. Each attribute is a characteristic of an object. For example, the Receive Count attribute in the JMS Summary attribute group counts the number of messages your applications have retrieved from JMS messages queues.

Attribute groups

The ITCAM Agent for J2EE attributes are organized into groups of related items. These attribute groups comprise the attribute tables for this agent. For example, the Garbage Collection Analysis attribute group provides information about the frequency with which the Java Virtual Machine (JVM) starts its garbage collector.

Attributes and workspaces

Various attributes are referenced by the predefined situations of the product. You can also use the IBM Tivoli Composite Application Manager for Application Diagnostics Agent for J2EE attributes to create your own situations to monitor the performance of your J2EE application servers and their applications. These situations can monitor your J2EE Application Server resources or correlate multiple conditions to alert you to problems that might have occurred when attribute values exceed defined thresholds.

Attribute groups used by the predefined workspaces

A workspace contains graphical data or report columns that correspond directly to particular attributes in an attribute group. The table shows the correlations between the predefined workspaces and the attribute groups. The primary and secondary workspaces are listed alphabetically, not in the order in which they display in the Navigator.

Table 83. Workspaces and the attribute groups they reference

Workspace	Related Attribute Groups
Application Health Summary	Application Health Status
Application Registry	Application Monitoring Configuration
Allocation Failures	Allocation Failure - J2EE
BEA WebLogic App Server	Application Server - J2EE Request Times and Rates - J2EE Garbage Collection Analysis - J2EE
Datasources Selected Datasource - History	Datasources - J2EE
DB Connection Pools Selected DB Connection Pool - History	DB Connection Pools - NetWeaver
EJB Components	Enterprise Java Bean Components - WebLogic
EJB Modules	Enterprise Java Bean Modules - J2EE
EJBs - Selected Enterprise Application	Enterprise Java Bean - WebLogic
Enterprise Java Beans	Enterprise Java Bean Service - NetWeaver Enterprise Java Bean Modules - J2EE

Table 83. Workspaces and the attribute groups they reference (continued)

Workspace	Related Attribute Groups
Garbage Collection Analysis	Garbage Collection Analysis - J2EE
Garbage Collections - Selected Allocation Failure	Garbage Collection Cycle - J2EE
J2EE Agent	J2EE Agent Events Application Server Status - J2EE
J2SE Application	Application Server - J2EE Request Times and Rates - J2EE Garbage Collection Analysis - J2EE
JBoss App Server	Application Server - J2EE Request Times and Rates - J2EE Garbage Collection Analysis - J2EE
JCA Connection Pools	JCA Connection Pools - J2EE J2EE Connector Connection Pools - WebLogic
JDBC Connection Pools Selected JDBC Connection Pool - History	JDBC Connection Pools - WebLogic
JMS Session	JMS Sessions - WebLogic
JMS Summary	JMS Summary
JTA Resources	JTA Resources - J2EE Java Transaction Service - WebLogic
JTA Summary	JTA Summary - NetWeaver
JVM Statistics	JDK - Operating System JDK - Memory JDK - JVM JDK - Threading
Log Analysis DC Message Events	Log Analysis - J2EE DC Messages - J2EE
Oracle App Server	Application Server - J2EE Request Times and Rates - J2EE Garbage Collection Analysis - J2EE
Request Analysis Selected Request - History	Request Analysis - J2EE
Selected Request - Baseline	Baseline attributes
Selected Application - Application Tier Analysis Selected Application - Backend Tier Analysis Selected Application - Health History Selected Application - Client Tier Analysis	Application Health Status
Selected Application - Configuration	Application Monitoring Configuration
Selected Request - Datasources	Selected Request - J2EE
Selected Request - JMS Queues	Selected Request - J2EE
SAP NetWeaver Server workspace	Application Server - J2EE Request Times and Rates - J2EE Garbage Collection Analysis - J2EE
Selected Request - Resource Adapters	Selected Request - J2EE
Servlets/JSPs - Selected Enterprise Application	Servlets and JSPs - WebLogic
Servlets/JSPs - Selected Web Application	Servlets JSPs - J2EE
Tomcat Server	Application Server - J2EE Request Times and Rates - J2EE Garbage Collection Analysis - J2EE

Table 83. Workspaces and the attribute groups they reference (continued)

Workspace	Related Attribute Groups
Web Applications	Web Applications - J2EE Web Applications - WebLogic
Web Containers	Web Container - NetWeaver
WebSphere App Server CE	Application Server - J2EE Request Times and Rates - J2EE Garbage Collection Analysis - J2EE

Allocation Failure - J2EE attributes

The **Allocation Failure - J2EE** attribute group provides information about the heap-allocation failure that caused the Java Virtual Machine hosting the application server to start its garbage-collection routine. Use the Allocation Failure attributes to determine the events that caused the JVM to start garbage collection.

The attributes within this group are used to build the "Allocation Failures workspace" on page 424.

Allocation Failure Number The identifier assigned to the current allocation-failure block, which is associated with a bar in the Heap Usage - History bar chart (supported IBM Developer Kit for Java). The valid format is a positive integer.

Bytes Needed The number of bytes needed on the heap when this allocation failure occurred. The valid format is a positive integer.

GC Cycle Count The number of Garbage Collection cycles ran for this allocation. The valid format is a positive integer.

Heap Expanded The total number of kilobytes by which the heap expanded or contracted as a result of garbage collection. The valid format is a positive integer.

Heap Free (%) after GC The percentage of heap that is free after allocation failure. The valid format is a positive integer.

Heap Status Indicates whether the out-of-heap-space alert has been raised. Valid values are Normal, Out_of_heap_space, Heap_space_is_low, and Insufficient_space.

Interval (sec) The length of the interval in seconds. The valid format is a positive integer.

Kbytes Free at Start of GC The number of kilobytes that were available in the heap before garbage collection began in response to this allocation failure. The valid format is a positive integer.

Kbytes Freed by GC The number of kilobytes freed for this allocation failure. The valid format is a positive integer.

Kbytes Used The number of kilobytes in the heap that were in use when this allocation failure occurred. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum length of 256 characters.

Objects Moved The total objects moved during compaction available. The valid format is a positive integer.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The process ID of the Java Virtual Machine (JVM). The valid format is a positive integer.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 84. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data were collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Time since Last Failure (ms) The time elapsed since the last allocation failure. The valid format is a positive integer.

Time to Complete (ms) The time (in milliseconds) taken to complete the action that resulted from this allocation failure. The valid format is a positive integer.

Total Kbytes Freed by GC The total number of kilobytes freed by the garbage collector in response to this allocation failure. The valid format is a positive integer.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Application Health Status attributes

The **Application Health Status** attributes provide information for real-time and historical application health status.

The attributes within this group are used to build the Application Health Summary workspace.

Application Health The combined application health level. Valid values are Unknown, Good, Fair, and Bad.

Application ID The unique identifier that is assigned automatically when the application is first configured and is preserved during the whole application life cycle. The valid format is a positive integer.

Application Name The name of the application to which the request belongs. The valid format is an alphanumeric string, with a maximum of 256 characters.

Application Status The status of the monitored application (only supported for Tomcat, and Oracle). Valid values are Standby, Discovered, Unknown, Starting, Running, Stopping, Stopped, and Failed.

Application Tier Health The health level of the application tier. Valid values are Unknown, Good, Fair, and Bad. Application tier health indicator is determined from EJB or custom request delays collected on the interval and compared against thresholds configured for application requests.

Backend Tier Health The health level of the backend tier. Backend tier health indicator is determined from JDBC, JCA, JNDI, JMS delays collected on the interval and compared against thresholds configured for application requests. Valid values are Unknown, Good, Fair, and Bad.

Client Tier Health The health level of the client tier. Valid values are Unknown, Good, Fair, and Bad. Client tier health indicator is determined from servlet/JSP or portal delays collected on the interval and compared against thresholds configured for application requests.

Completion Level The completion level of the requests during the interval. Valid values are Unknown, Good, Fair, and Bad. This attribute is determined from request data as the percentage of number of failed requests to the total number of application requests on the interval.

Custom Requests The availability indicator of custom requests. Valid values are Unknown, Good, Fair, and Bad.

EJB Container The health level of the EJB container. Valid values are Unknown, Good, Fair, and Bad. This attribute is determined from EJB delay types collected during the interval and compared against application thresholds.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

JCA The overall health status of J2EE Connector Architecture (JCA) resources used by applications. Valid values are Unknown, Good, Fair, and Bad. This attribute is determined from JCA delay types collected during the interval and compared against application thresholds.

JDBC The overall health status of Java DataBase Connectivity (JDBC) resources used by applications. Valid values are Unknown, Good, Fair, and Bad. This attribute is determined from JDBC delay types collected during the interval and compared against application thresholds.

JNDI The overall health status of Java Naming and Directory Interface (JNDI) resources used by applications. Valid values are Unknown, Good, Fair, and Bad.

This attribute is determined from JNDI delay types collected during the interval and compared against application thresholds.

JMS The overall health status of Java Message Service (JMS) resources used by applications. Valid values are Unknown, Good, Fair, and Bad. This attribute is determined from JMS delay types collected during the interval and compared against application thresholds.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Portal Container The health level of the portal container. Valid values are Unknown, Good, Fair, and Bad. This attribute is determined from portal delay types collected during the interval and compared against application thresholds.

Response Level The health level of the response time for the requests. Valid values are Unknown, Good, Fair, and Bad. This attribute is determined from application requests response times collected during the interval and compared against application thresholds.

Sample Date and Time The date and time the Tivoli Enterprise Monitoring Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 85. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Web Container The health level of the web container. Valid values are Unknown, Good, Fair, and Bad.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Application Monitoring Configuration attributes

The **Application Monitoring Configuration** attributes provide information for the Application Monitoring Configuration. Use these attributes to monitor different J2EE applications running within an application server.

The attributes within this group are used to build the Selected Application - Configuration workspace.

Application Alias The alias name that you can optionally assign for the application. In practice, this attribute enables you to combine multiple applications under the same common alias and report their request in the Tivoli Enterprise Portal as it would come from same application. This attribute is blank by default. You can assign the value to it from Take Actions at any time in the application monitoring life cycle. The valid format is an alphanumeric string, with a maximum of 256 characters.

App ID The unique identifier that is assigned automatically when the application is first configured and is preserved during the whole application life cycle. The valid format is a positive integer.

Application Name The name of the application to which the request belongs. You can define the pattern of this name in the Application Registry workspace. The valid format is an alphanumeric string, with a maximum of 256 characters.

Bad Completion Rate (%) The bad completion rate threshold for the requests. The valid format is an alphanumeric string, with a maximum of 256 characters.

Baselining Elapsed Time The number of seconds during which the application baselining has been running. The valid format is a positive integer.

Baselining Status The status of the application baselining process. Valid values are Idle, Running, and Standby.

Baselining Scheduled Stop Time The date and time baselining is scheduled to finish. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 86. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Baselining Start Time The date and time when the application baselining was started. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 87. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Baselining Update Interval The number of seconds that defines how often active baselining data is incrementally updated to the monitoring agent. The valid format is a positive integer.

Fair Completion Rate (%) The fair completion rate threshold for the requests. The valid format is an alphanumeric string, with a maximum of 256 characters.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Monitoring Status The current application monitoring status. Valid values are Discovered, Enabled, Disabled, and Standby.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Data Monitoring Level The custom request aggregation level for all application requests. Valid values are Default, Disabled, Level1, and Level2. This attribute is set to Default when the application is first discovered.

Request Data Sampling Rate The custom request aggregation rate for all application requests. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Management Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 88. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Application Server Status - J2EE attributes

The **Application Server Status - J2EE** attributes provide status information for all J2EE application servers as well as the J2EE administrative server being monitored by the OMEGAMON XE agent.

The attributes within this group are used to build the "J2EE Agent workspace" on page 435.

Cluster Name The name of the server group (cluster) that the application server belongs to. The valid format is an alphanumeric string, with a maximum of 128 characters. This is supported for WebLogic application server only.

J2EE Configuration Repository Directory Name The name of the J2EE configuration repository directory, which normally resides in the config subdirectory of the product installation root directory. The valid format is an alphanumeric string, with a maximum of 128 characters.

J2EE Node Name The name of the J2EE node group that the application server belongs to. The valid format is an alphanumeric string, with a maximum of 64 characters.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The process identifier of the Java virtual machine. The valid format is a positive integer.

Sample Date and Time The date and time that the OMEGAMON XE for J2EE Application Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 89. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year

Table 89. Format of the 12-character timestamp (continued)

Character String	Meaning
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Start Date and Time The date and time when the J2EE application server started. The valid format is a timestamp. This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Status The status of the J2EE Application Server. The valid values are Starting, Running, Stopping, Stopped, and Failed.

Server Type The type of J2EE server. The valid values are Unknown, AppServer, AdminServer.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Application Server - J2EE attributes

The **Application Server - J2EE** attributes gather status and summary data for a specific J2EE application server. They provide performance data for the J2EE Application Server runtime (JVM memory), HTTP sessions, and configuration parameters. They also provide some information from other attribute groups to provide an overall view of the J2EE application server. Use the Application Server attributes to monitor the health and performance of a J2EE application server.

The attributes within this group are used to build the J2EE application servers workspaces.

CPU Used (ms) The number of milliseconds used during the interval. The valid format is a positive integer.

CPU Used (%) The percentage of the CPU used during the interval. The valid format is a decimal (formatted to one decimal place).

Garbage Collection Monitoring This attribute indicates whether Garbage Collection is being monitored. Valid values are Disabled and Enabled.

Instrumentation Level The JVM instrumentation level. Valid values are None, Low, Medium, High, Basic, Extended, All, Custom and Maximum. This field is blank if no instrumentation level is set.

Interval (sec) The length of the interval in seconds. The valid format is a positive integer.

JVM Memory Free (bytes) The amount of JVM memory that is free (in bytes). Minimum instrumentation level required to collect these data: Low. The valid format is a positive integer.

JVM Memory Total (bytes) The total amount of JVM memory (in bytes). Minimum instrumentation level required to collect these data: Low. The valid format is a positive integer.

JVM Memory Used (bytes) The amount of JVM memory that has been used (in bytes). Minimum instrumentation level required to collect these data: Low. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, maximum 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, maximum 128 characters.

Process CPU Utilization (ms) The process CPU utilization. The valid format is a positive integer.

Process ID The process identifier of the Java virtual machine. The valid format is a positive integer.

Resource Data Monitoring This attribute indicates whether resource data is being monitored. Valid values are Disabled and Enabled.

Request Data Monitoring Level The monitoring level for request data stored by the data collector. Valid values are Disabled, Level1 (in other words, only edge request data-such as servlets and JSPs- are displayed), and Level2 (nested request data, such as JDBC and JMS requests, are also displayed).

Request Data Sampling Rate (%) The percentage of requests being sampled. The valid format is a positive integer.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 90. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute

Table 90. Format of the 12-character timestamp (continued)

Character String	Meaning
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, maximum 256 characters.

Start Date and Time The date and time when the J2EE application server started. The valid format is a timestamp. This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Status The status of the J2EE application server. The valid values are Starting, Running, Stopping, Stopped, and Failed.

System Paging Rate (Kbytes/sec) The system paging rate during the interval. The valid format is a positive integer.

Version The version of the J2EE Application Server. The valid format is an alphanumeric string maximum 8 characters.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Baseline attributes

The **Baseline** attributes provide information for baseline extract data for the given application. The baselining collects statistical information about an application requests completion times and uses this information to assign fair and bad thresholds on the application requests. The product divides the whole request response times into buckets and collects individual hits into each bucket. Use these attributes to get statistics from individual requests collected during the baselining interval.

The attributes within this group are used to build the Selected Request - Baseline workspace.

Application ID The unique identifier that is assigned automatically when the application is first configured and is preserved during the whole application life cycle. The valid format is a positive integer.

Bad Hits (%) The percentage of bucket hits in the metric bad value zone. The valid format is a positive integer.

Bucket Number The bucket number of the baselining data. The valid format is a positive integer.

EJB (%) The average percent of time that bucket requests were executed inside EJB container. The valid format is a positive integer.

Fair Hits (%) The percentage of bucket hits in the metric fair value zone. The valid format is a positive integer.

Good Hits (%) The percentage of bucket hits in the metric good value zone. The valid format is a positive integer.

Hits (%) The percentage of hits for the bucket during the baselining. The valid format is a positive integer.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

JCA (%) The average percent of time that bucket requests spent for JCA access. The valid format is a positive integer.

JDBC (%) The average percent of time that bucket requests spent for JDBC access. The valid format is a positive integer.

JMS (%) The average percent of time that bucket requests spent for JMS access. The valid format is a positive integer.

JNDI (%) The average percent of time that bucket requests spent for JNDI access. The valid format is a positive integer.

Lower Boundary (msec) The lower boundary of bucket response times in milliseconds. The valid format is a positive integer.

Metric ID The metric identifier of the baselining data. The valid format is a positive integer.

Metric Type The metric type of the baselining data. Valid formats are Request, Error, and Resource.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Portal (%) The average percent of time that bucket requests were executed inside portal container. The valid format is a positive integer.

Response Time Mean (msec) The mean time of bucket response times. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Management Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 91. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Selection Hits (%) The percentage of bucket hits in the metric selection value zone. The valid format is a positive integer.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Servlet JSP (%) The average percent of time that bucket requests were executed inside the servlet container. The valid format is a positive integer.

Total Hits The total hits number for the bucket during the baselining. The valid format is a positive integer.

Upper Boundary (msec) The upper boundary of bucket response times. The valid format is a positive integer.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Data sources - J2EE attributes

The **Data sources - J2EE** attributes provide database usage information. For example, these attributes provide traffic information such as response times for database requests, the frequencies at which database connections are created and destroyed, and how often databases are accessed.

The attributes within this group are used to build the Data sources workspace .

Important: The attributes within this attribute group contain meaningful values only if your site has set the request data monitoring level to Level2 to collect data on data source requests.

Application ID The unique identifier that is assigned automatically when the application is first configured and is preserved during the whole application life cycle. The valid format is a positive integer.

Average Processing Time (ms) The total average processing time (in milliseconds) that the data source is used by an application. The valid format is a decimal (formatted to three decimal places).

Average Query Processing Time (ms) The average time (in milliseconds) per request used by queries to the data source. The valid format is a decimal (formatted to three decimal places).

Average Update Processing Time (ms) The average time (in milliseconds) per request used by updates to the data source. The valid format is a decimal (formatted to three decimal places).

Connection Average Wait Time (ms) The average time (in milliseconds) that applications had to wait for a connection. The valid format is a decimal (formatted to three decimal places).

Connection Count The number of connections to the data source. The valid format is a positive integer.

Connection Max Wait Time (ms) The maximum amount of time (in milliseconds) that applications had to wait for a connection to the data source. The valid format is a positive integer.

Connection Rate (per sec) The number of connection requests (per second) created for the data source. The valid format is a decimal (formatted to three decimal places).

Connection Total Wait Time (ms) The total time (in milliseconds) that applications had to wait for a connection to the data source. The valid format is a positive integer.

Database Product The name of the database product. The valid format is an alphanumeric string, with a maximum of 128 characters.

Database Product Version The version of the database product. The valid format is an alphanumeric string, with a maximum of 128 characters.

Datasource Label A shortened version of Data source Name, used to display the data source name in the chart view. The valid format is an alphanumeric string, with a maximum of 12 characters.

Datasource Name The name of the data source. The valid format is an alphanumeric string, with a maximum of 256 characters.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the application server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The unique identifier of the process running the Java Virtual Machine (JVM). The valid format is a positive integer.

Query Count The number of queries performed against the data source. The valid format is a positive integer.

Query Rate (per sec) The number of queries (per second) being made to the data source. The valid format is a decimal (formatted to three decimal places).

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 92. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Sampling Rate % The percentage of edge requests-such as servlets and JSPs-that were sampled for data source requests during the interval. The valid format is a positive integer.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Total Query Processing Time (ms) The total time (in milliseconds) used to process queries made to the data source. The valid format is a positive integer.

Total Update Processing Time (ms) The total time (in milliseconds) used to update the data source. The valid format is a positive integer.

Total Wait Time (ms) The time (in milliseconds) that applications had to wait for connections to the data source. The valid format is a positive integer.

Update Count The number of updates performed against the data source. The valid format is a positive integer.

Update Rate (per sec) The number of updates (per second) made to the data source. The valid format is a decimal (formatted to three decimal places).

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

DB Connection Pools - NetWeaver attributes

The **DB Connection Pools - NetWeaver** attributes collect information about the database connection pool for each defined data source.

The attributes within this group are used to build the "DB Connection Pools workspace" on page 428.

Current Size The current size of data source pool. The valid format is a positive integer.

Datasource Name The name of the data source. The valid format is an alphanumeric sting, with a maximum of 256 characters.

Increment Step The increment step of data source pool. The valid format is a positive integer.

Init Size The initial size of data source pool. The valid format is a positive integer.

Interval (sec) The length of the interval in seconds. The valid format is a positive integer.

Max Size The maximum size of data source pool. The valid format is a positive integer.

Min Size The minimum size of data source pool. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Row Number The row number. The valid format is a positive integer.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 93. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data were collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

UsedConnectionsCount The number of used connections. The valid format is a positive integer.

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

DC Messages - J2EE attributes

The **DC Messages - J2EE** attribute group provides information about the data collector Messages.

The attributes within this group are used to build both the "Log Analysis workspace" on page 442 and the "DC Message Events workspace" on page 429.

Component The name of the component that caused the error. The valid format is an alphanumeric string, maximum 32 characters.

Event Date and Time The date and time that the event occurred. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 94. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

File Name The name of the file. The valid format is an alphanumeric string, with a maximum of 256 characters.

Message Description The description of the message. The valid format is an alphanumeric string, with a maximum of 256 characters.

Message ID The ID of the message. The valid format is an alphanumeric string, with a maximum of eight characters.

Method Name The name of the method. The valid format is an alphanumeric string, with a maximum of 256 characters.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Severity The severity of the message. Valid values are Info, Warning, Error, and Severe.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Sequence Number The sequence number in JMX notification stream. The valid format is a positive integer.

Thread ID The ID of the thread where the event occurred. The valid format is an alphanumeric string, with a maximum of 16 characters.

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Enterprise Java Bean Components - WebLogic attributes

The **WebLogic EJB Components - WebLogic** attributes provide the runtime information for an EJB component.

The attributes within this group are used to build the "EJB Components workspace" on page 430.

Current Entity EJBs The number of current entity EJBs. The valid format is a positive integer.

Current Message Driven EJBs The number of current message driven EJBs. The valid format is a positive integer.

Current Stateful EJBs The number of current stateful EJBs. The valid format is a positive integer.

Current Stateless EJBs The number of current stateless EJBs. The valid format is a positive integer.

Deployment State The current deployment state of the component. Valid values are Unprepared, Prepared, Activated, and New.

Enterprise Application Name The J2EE application name. The valid format is an alphanumeric string, with a maximum of 128 characters.

EJB Component Name The EJB Component name. The valid format is an alphanumeric string, with a maximum of 128 characters.

Interval (sec) The length of the interval in seconds. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Row Number The row number. The valid format is a positive integer.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 95. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Enterprise Java Bean Modules - J2EE attributes

The **Enterprise Java Bean Modules - J2EE** attributes collect performance information about each Enterprise Java Bean (EJB) deployed to the application server.

The attributes within this group are used to build the “EJB Modules workspace” on page 432 and “Enterprise Java Beans workspace” on page 431.

Bean Name The name of the Enterprise Java Bean (EJB); this name prefixes the application name and the EJB JAR name. The valid format is an alphanumeric string, with a maximum of 128 characters.

Bean Type The type of bean. Valid values are Stateless, Stateful, Entity, and Message_Driven.

Create Count The number of times that beans were created during the interval. Minimum instrumentation level required to collect these data: Low. The valid format is a positive integer.

EJB Module The name of the EJB Module. The valid format is an alphanumeric string, with a maximum of 128 characters.

EJB Count The number of EJBs in the EJB module. The valid format is a positive integer.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Message Count The number of messages delivered to the bean on Message method. The valid format is a positive integer.

Method Ready Count The number of bean instances in ready state. The valid format is a positive integer.

Method Ready Count High The high water mark of the number of bean instances in ready state. The valid format is a positive integer.

Method Ready Count Low The low water mark of the number of bean instances in ready state. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Passive Count The number of beans that are in a passivated state (entity and stateful). Minimum instrumentation level required to collect these data: Low. The valid format is a positive integer.

Passive Count High The high water mark of the beans that are in a passivated state (entity and stateful). The valid format is a positive integer.

Passive Count Low The low water mark of the beans that are in a passivated state. The valid format is a positive integer.

Pooled Count The average number of objects in the pool. The valid format is a positive integer.

Pooled Count High The high water mark of the average number of objects in the pool. The valid format is a positive integer.

Pooled Count Low The low water mark of the average number of objects in the pool. The valid format is a positive integer.

Ready Count The number of bean instances in ready state. The valid format is a positive integer.

Ready Count High The high water mark of bean instances in ready state. The valid format is a positive integer.

Ready Count Low The low water mark of bean instances in ready state. The valid format is a positive integer.

Remove Count The number of times that beans were removed. Minimum instrumentation level required to collect these data: Low. The valid format is a positive integer.

Row Number The row number. The valid format is a positive integer.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 96. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Summary of All EJB Modules The summary of statistical totals for all EJB modules. Valid values are EJB, No, and Yes.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Enterprise Java Bean Service - NetWeaver attributes

The **Enterprise Java Bean Service - NetWeaver** attributes collect performance information about each Enterprise Java Bean deployed to SAP NetWeaver application server.

The attributes within this group are used to build the “Enterprise Java Beans workspace” on page 431 in SAP NetWeaver Server.

Activations Number The number of activations. The valid format is a positive integer.

Active Sessions Count The count of not passivated sessions. The valid format is a positive integer.

Active Sessions Timeout The timeout for the active sessions. If a session stays idle and not passivated for this long, it is removed. The valid format is a positive integer.

Application Name The name of application using EJB. The valid format is an alphanumeric string, with a maximum of 128 characters.

Bean Name The bean class name. The valid format is an alphanumeric string, with a maximum of 128 characters.

Bean Type The type of Bean. Valid formats are Stateless, Stateful, Entity, Message_Driven, and [Summary].

Create Count The count of times of a "create" method was invoked on the bean. The valid format is a positive integer.

Current Pool Size The current size of pool. The valid format is a positive integer.

Completed Sessions The count of already completed sessions. The valid format is a positive integer.

EJB Count The number of EJB in the EJB module. The valid format is a positive integer.

EJB Module The name of the EJB Module. The valid format is an alphanumeric sting, with a maximum of 128 characters.

Initial Pool Size The initial size of pool. The valid format is a positive integer.

Interval Time The length of the interval in seconds. The valid format is a positive integer.

Loads Number The number of loads. The valid format is a positive integer.

Max Pool Size The maximum size of pool. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Passive Sessions Count The count of passivated sessions. The valid format is a positive integer.

Passive Sessions Timeout The timeout for the passive sessions. If a session stays idle and passivated for this long, it is removed. The valid format is a positive integer.

Passivations Number The number of passivations. The valid format is a positive integer.

PoolCurrUsed0bj The number of currently used pool objects. The valid format is a positive integer.

Pool Increment Size The size of pool increment. The valid format is a positive integer.

Remove Count The count of times of a "remove" method was invoked on the bean. The valid format is a positive integer.

Row Number The row number. The valid format is a positive integer.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 97. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Stores Number The number of the stores. The valid format is a positive integer.

Summary of All EJB Modules The summary row of statistical totals for all EJB modules. Valid values are EJB and Yes.
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Enterprise Java Beans - WebLogic attributes

The **Enterprise Java Beans - WebLogic** attributes collect performance information about each Enterprise Java Bean deployed to the WebLogic application server.

The attributes within this group are used to build the “EJBs - Selected Enterprise Application workspace” on page 433.

Activation Rate The number of beans from this EJB Home that have been activated per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Beans Destroyed Percent The percent of the number of beans destroyed from the number of requests for a bean for the interval since the previous sample. The valid format is a decimal (formatted to one decimal place).

Cache Accesses The number of attempts to access a bean from the cache for the interval since the previous sample. The valid format is a positive integer.

Cache Access Rate The number of attempts per second to access a bean from the cache for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Cache Miss Percent The percent of the number of times a container cannot find a bean in the cache to the number of times it attempts to find a bean in the cache for the interval since the previous sample. The valid format is a decimal (formatted to one decimal place).

Current Cached Beans The total number of beans from this EJB Home currently in the EJB cache. The valid format is a positive integer.

Current Lock Entries The current number of beans currently locked. The valid format is a positive integer.

Current Lock Waiters The current number of threads that wait for a lock on a bean. The valid format is a positive integer.

Current Pool Beans The summary number of free and in-use beans in the pool. The valid format is a positive integer.

Current Pool Free Percent The percent of the free beans available in the pool. The valid format is a decimal (formatted to one decimal place).

Current Pool Waiters The number of threads currently waiting for an available bean instance from the free pool. The valid format is a positive integer.

Enterprise Application Name The J2EE application name. The valid format is an alphanumeric string, with a maximum of 128 characters.

EJB Component Name The EJB Component name. The valid format is an alphanumeric string, with a maximum of 128 characters.

EJB Name The EJB-name for this EJB. It is as defined in the ejb-jar.xml deployment descriptor. The valid format is an alphanumeric string, with a maximum of 128 characters.

EJB Type The type of EJB. Valid values are Stateless, Stateful, Entity and Message Driven.

Interval (sec) The length of the interval in seconds. The valid format is a positive integer.

Lock Manager Accesses The number of attempts to obtain a lock on a bean since the previous sample. The valid format is a positive integer.

Lock Manager Access Rate The number of attempts to obtain a lock on a bean per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Lock Timeout Percent The percent of timeouts to accesses for the lock manager for the interval since the previous sample. The valid format is a decimal (formatted to one decimal place).

Lock Waits Percent The percent of times a thread had to wait to obtain a lock on a bean comparing to the total amount of lock requests issued for the interval since the previous sample. The valid format is a decimal (formatted to one decimal place).

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Passivation Rate The number of beans from this EJB Home that have been passivated per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Pool Accesses The number of times an attempt was made to get an instance from the free pool since the previous sample. The valid format is a positive integer.

Pool Access Rate The number of times per second an attempt was made to get an instance from the free pool for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Pool Miss Percent The percent of times a request was made to get a bean from the pool when no beans were available. The valid format is a decimal (formatted to one decimal place).

Pool Timeout Percent The percent of requests that have timed out waiting for a bean from the pool from the total number of requests made for the interval since the previous sample. The valid format is a decimal (formatted to one decimal place).

Row Number The row number. The valid format is a positive integer.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 98. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Transactions Processed The number of transactions processes. The valid format is a positive integer.

Transaction Process Rate The number of transactions processed per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Transaction Rolled Back Percent The percent transactions that have rolled back to the number of total transactions involving the EJB for the interval since the previous sample. The valid format is a decimal (formatted to one decimal place).

Transactions Timed Out Percent The percent of transactions that have timed out to the number of total transactions involving the EJB for the interval since the previous sample. The valid format is a decimal (formatted to one decimal place).

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Garbage Collection Analysis - J2EE attributes

The **Garbage Collection Analysis - J2EE** attribute group provides information from the profiler about the garbage collector in the Java Virtual Machines that are hosting an application server. For example, these attributes report the number of times the collector ran during the interval and the resulting number of objects that the collector freed. Use the Garbage Collection Analysis attributes in situations to monitor garbage-collection performance and possible problems.

The attributes within this group are used to build the “Garbage Collection Analysis workspace” on page 433 and the J2EE application servers workspaces.

GC Rate (per min) The rate (per minute) at which the Java Virtual Machine is invoking its garbage-collection routine. The valid format is a decimal (formatted to three decimal places).

Heap Used (%) The percentage of heap used at the end of interval. The valid format is a decimal (formatted to one decimal places).

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Kbytes Free The total number of free kilobytes in the heap at the end of the last garbage-collection cycle during the interval. The valid format is a positive integer.

Kbytes Used The number of kilobytes in the heap that were in use at the end of the last garbage collection cycle during the interval. The valid format is a positive integer.

Kbytes Used Delta The delta value between the "Kbytes in Use" value for this interval and the "Kbytes in Use" value for the prior interval. A positive value indicates that the number of kbytes in use grew during the interval. The valid format is a positive or negative integer.

Kbytes Total Freed by GC The total number of kbytes freed by the garbage collector during the interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Objects Freed The number of objects the garbage collector freed during the interval (supported for IBM Developer Kit for Java). The valid format is a positive integer.

Objects Moved The number of objects the garbage collector moved during the interval (supported for IBM Developer Kit for Java). The valid format is a positive integer.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The process ID of the JVM. The valid format is a positive integer.

Real Time (ms) The total real time (in milliseconds) that the garbage collector required during the most recent cycle. The valid format is a positive integer.

Real Time % The percentage of real time that the garbage collector was active during the interval. The valid format is a decimal (formatted to one decimal place).

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 99. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Times Run The number of times the garbage collector ran during the interval. The valid format is a positive integer.

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Garbage Collection Cycle - J2EE attributes

The **Garbage Collection Cycle - J2EE** attribute group provides information about a single garbage-collection cycle that the Java Virtual Machine hosting the application server performed. For example, these attributes report the free heap space before and after garbage collection, the heap space freed, and the number of objects moved during garbage collection. Use the Garbage Collection Cycle attributes in situations to examine the results of a particular garbage collection.

The attributes within this group are used to build the Garbage Collections - Selected Allocation Failure workspace .

Allocation Failure Number The allocation failure block number for which this cycle ran (supported for IBM Developer Kit for Java). The valid format is a positive integer.

Compact (ms) The time (in milliseconds) required for the compaction phase of the garbage-collection cycle. The valid format is a positive integer.

Compaction Reason The code describing the reason garbage collection was initiated. The valid format is a positive integer.

The compaction codes are shown in the following table:

Table 100. Reasons for initiating garbage collection

Compaction Code	Definition
1	Insufficient free space for the allocation request following the mark and sweep phases.
2	The heap is fragmented and benefits from a compaction.
3	Less than 15% free space available.
4	A call to System.gc requested garbage collection.
5	Less than 5% free space available.
6	Less than 128 K free space available.
7	Parameter Xcompactgc specified.
8	The transient heap has less than 5% free space available.
9	The heap is fragmented (this code marks additional reasons for compaction apart from compaction code 2).

Final sees The Final references that are collected. The valid format is a positive integer.

Garbage Collection Number The garbage collection cycle number. The valid format is a positive integer.

GC Date and Time The date and time the Java Virtual Machine invoked the garbage collector. The valid format is a 16-character timestamp. This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Note to Solaris and HP-UX users: Because allocation-failure information is not recorded on these platforms, this column is always empty on these platforms.

Heap Capacity The total number of kilobytes allocated to the main heap after this garbage-collection cycle. The valid format is a positive integer.

Heap Free % after GC The percentage of heap space that is available after this garbage-collection cycle. The valid format is a decimal (formatted to one decimal place).

Heap Space Free (kbytes) The number of kilobytes available within the heap after this garbage-collection cycle. The valid format is a positive integer.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Kbytes Free at Start of GC The number of kilobytes available in the heap before garbage collection began. The valid format is a positive integer.

Kbytes Freed The number of kilobytes freed by the garbage collector. The valid format is a positive integer.

Kbytes Moved The number of kilobytes moved on the heap during this compaction. The valid format is a positive integer.

Kbytes Used The number of kilobytes in the heap that were in use after this garbage-collection cycle. The valid format is a positive integer.

Mark (ms) The time (in milliseconds) required for the mark phase of the garbage-collection cycle. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Objects Moved The number of objects the garbage collector moved during this compaction. The valid format is a positive integer.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Phantom sees The number of phantom reference objects collected during this garbage-collection cycle. "Phantom" refers to a specific Java class that defines object reachability. The valid format is a positive integer.

Process ID The unique identifier of the JVM process (the class ID of the JVM). The valid format is a positive integer.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 101. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year

Table 101. Format of the 12-character timestamp (continued)

Character String	Meaning
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Soft sees The number of soft reference objects collected during this garbage-collection cycle. "Soft" refers to a specific Java class that defines object reachability. The valid format is a positive integer.

Sweep (ms) The time (in milliseconds) required for the sweep phase of the garbage-collection cycle. The valid format is a positive integer.

Time to Complete (ms) The time (in milliseconds) required to complete this garbage-collection cycle. The valid format is a positive integer.

Weak sees The number of weak reference objects collected during this garbage-collection cycle. "Weak" refers to a specific Java class that defines object reachability. The valid format is a positive integer.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

J2EE Agent Events attributes

The **J2EE Agent Events** attributes collect information about agent-level events that affect the ability of the OMEGAMON XE agent to collect data about J2EE Application Server. These attributes provide error messages, their IDs, and their severities.

The attributes within this group are used to build the “J2EE Agent workspace” on page 435.

Event Date and Time The date and time that the event occurred. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 102. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day

Table 102. Format of the 12-character timestamp (continued)

Character String	Meaning
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

File Name The name of the file. The valid format is an alphanumeric string, with a maximum of 64 characters.

Function Indicates the description of the message. The valid format is an alphanumeric sting, with a maximum of 32 characters.

Message Description The message description. The valid format is an alphanumeric string, with a maximum of 256 characters.

Message ID The message ID. The valid format is an alphanumeric string, with a maximum of eight characters.

Node Name The system on which the server is running. The valid format is an alphanumeric string, with a maximum of 128 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Severity The severity of the message. Valid values are Info, Warning, Error, and Severe.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

J2EE Connector Connection Pools - WebLogic attributes

The **J2EE Connector Connection Pools - WebLogic** attributes provide data and statistics for the Oracle/BEA WebLogic Connector Connection Pools.

The attributes within this group are used to build the "JCA Connection Pools workspace" on page 437.

Connection Creation Rate The number of Connector connections created in this Connection Pool per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Connection Destroy Rate The number of Connector connections destroyed in this Connector Pool per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Connections Matched The number of times a request for a Connector connection was satisfied via the use of an existing created connection since the previous sample. The valid format is a positive integer.

Connection Match Rate The number of times a request for a Connector connection was satisfied per second via the use of an existing created connection since the previous sample. The valid format is a decimal (formatted to three decimal places).

Connections Recycled The number of Connector connections that have been recycled in this Connector Pool since the previous sample. The valid format is a positive integer.

Connection Recycled Rate The number of Connector connections that have been recycled in this Connector Pool per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Connection Rejected The number of rejected requests for a Connector connection since the previous sample. The valid format is a positive integer.

Connection Rejection Rate The number of rejected requests for a Connector connection per second since the previous sample. The valid format is a decimal (formatted to three decimal places).

Cumulative Average Active Connections Usage The running average usage of created connections that are active in the Connector Pool since the pool was last shrunk. The valid format is a positive integer.

Current Active Connections The current number of active connections. The valid format is a positive integer.

Current Free Connections The current number of free connections. The valid format is a positive integer.

Interval (ms) The length of the interval in seconds. The valid format is a positive integer.

JNDI Name The configured JNDI Name for the Connection Factory using this Connector connection pool. The valid format is an alphanumeric string, with a maximum of 128 characters.

Highest Active Connections The high water mark of active connections in this Connector Pool since the pool was instantiated. The valid format is a positive integer.

Highest Free Connections The high water mark of free connections in this Connector Pool since the pool was instantiated. The valid format is a positive integer.

Idle Connections Detected The number of idle connections detected for the interval since the previous sample. The valid format is a positive integer.

Leaked Connections Detected The number of leaked connections detected for the interval since the previous sample. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Maximum Capacity The maximum capacity configured for this Connector connection pool. The valid format is a positive integer.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Row Number The row number. The valid format is a positive integer.

Sample Date and Time The date and time the Tivoli Enterprise Management Agent for WebLogic Server agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 103. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

JCA Connection Pools - J2EE attributes

The **JCA Connection Pools - J2EE** attribute group collects information about the JCA connection pools for each connection factory.

The attributes within this group are used to build the JCA Connection Pools workspace .

Average Usage Time (ms) The average time in milliseconds that a connection was in use. The valid format is a decimal (formatted to three decimal places).

Average Pool Size The average number of Managed Connections for the interval. Minimum instrumentation level required to collect these data: High. The valid format is a decimal (formatted to three decimal places).

Average Wait Time (ms) The average time in milliseconds that a client waited to be granted a connection. The valid format is a decimal (formatted to three decimal places).

Connections Closed The number of connections released. The valid format is a positive integer.

Connections Created The total number of Managed Connections created during the sampling interval. Minimum instrumentation level required to collect these data: Low. The valid format is a positive integer.

Connection Factory The name of Connection Factory. The valid format is an alphanumeric string, with a maximum of 256 characters.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

JCA Pool Label The short name of the JCA Pool. The valid format is an alphanumeric string, with a maximum of 32 characters.

JCA Pool Usage % The percentage of the pool that was used during the sampling interval. The valid format is a decimal (formatted to three decimal places).

Maximum Pool Size The maximum number of managed connections that can be created in this connection pool (the field is blank for each individual managed connection). The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 104. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Total Usage (ms) The total time used. The valid format is a decimal (formatted to three decimal places).

Total Wait (ms) The total time wait. The valid format is a decimal (formatted to three decimal places).

Waiting Threads The number of threads waiting for a connection. The valid format is a positive integer.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

JDBC Connection Pools - WebLogic attributes

The **JDBC Connection Pools - WebLogic** attributes provide data and statistics for JDBC connection pools.

The attributes within this group are used to build the "JDBC Connection Pools workspace" on page 438.

Average Connection Delay The averaged time necessary to get a connection from the database for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Connections Created The number of JDBC connections created during the interval. The valid format is a positive integer.

Connection Creation Rate The number of JDBC connections per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Cumulative Average Active Connections The running average of active connections in this pool. The valid format is a positive integer.

Current Active Connections The current number of active connections in this pool. The valid format is a positive integer.

Current Available Connections The current number of connections that are available to applications. The valid format is a positive integer.

Current Capacity The current number of database connections in this pool. The valid format is a positive integer.

Current Unavailable Connections The current number of connections in this pool that are being tested or refreshed and not available to the applications. The valid format is a positive integer.

Current Waiters The current number of waiters for a connection. The valid format is a positive integer.

Leaked Connections Detected The number of leaked connections for the interval since the previous sample. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Highest Active Connections The high water mark of active connections in this pool. The valid format is a positive integer.

Highest Available Connections The highest number of connections that were available to applications. The valid format is a positive integer.

Highest Unavailable Connections The highest number of connections in this pool that are being tested or refreshed and not available to the applications. The valid format is a positive integer.

Highest Waiters The highest number of waiters for a connection. The valid format is a positive integer.

Highest Wait Time (sec) The number of seconds the longest waiter for a connection waited. The valid format is a positive integer.

Interval (sec) The length of the interval in seconds. The valid format is a positive integer.

JDBC Pool Name The JDBC connection pool name. The valid format is an alphanumeric string, with a maximum of 128 characters.

Maximum Capacity The maximum capacity of this connection pool. The valid format is a positive integer.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Pool State The current state of the connection pool. Valid values are Running, Suspended, Unhealthy, and Unknown.

Prepared Statement Cache Access The number of prepared statement cache accesses. The valid format is a positive integer.

Prepared Statement Cache Misses Percent The percent of the number of times a prepared statement was not found in the cache to the total number of requests for a prepared statement for the interval since the previous sample. The valid format is a decimal (formatted to one decimal place).

Reconnect Failures The number of cases when a connection pool attempted to refresh a connection to a database and failed. The valid format is a positive integer.

Row Number The row number. The valid format is a positive integer.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 105. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year

Table 105. Format of the 12-character timestamp (continued)

Character String	Meaning
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

JDK - Operation System attributes

The **JDK - Operation System** attributes provide data and statistics of the operating system on which the J2SE application server is running. The information includes the operating system architecture, name, version, and the available memory information. The data for attributes is gathered from JVM MBeans, which are supported in JVM version 1.5 and higher. No data is available for JVM with versions lower than 1.5.

The attributes within this group are used to build the "JVM Statistics workspace" on page 441.

Architecture The architecture of the operating system on which the J2SE application server is running (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 256 characters.

Available Processors The number of available processors of the operation system on which the J2SE application server is running (supported for JVM version 1.5 and higher). The valid format is a positive integer.

Committed Virtual Memory Size The committed virtual memory size in kilobytes (supported for JVM version 1.5 and higher). The valid format is a positive integer or N/A if this attribute is not applicable.

Free Physical Memory The free physical memory (in kilobytes) of the operation system (supported for JVM version 1.5 and higher). The valid format is a positive integer or N/A if this attribute is not applicable.

Free Swap Space Size The free swap space size (in kilobytes) of the operating system (supported for JVM version 1.5 and higher). The valid format is a positive integer or N/A if this attribute is not applicable.

Interval (sec) The length of the interval in seconds (supported for JVM version 1.5 and higher). The valid format is a positive integer.

Node Name The name of the system on which the server is running (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 128 characters.

OS Name The name of the operating system, such as Windows 2003 (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 256 characters.

OS Version The version of the operating system on which the J2SE application server is running (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 256 characters.

Processing Capacity The processing capacity of operation system (supported for JVM version 1.5 and higher). The valid format is a positive integer or N/A if this attribute is not applicable.

Sample Date and Time The date and time that the monitoring agent collected data (supported for JVM version 1.5 and higher). The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 106. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 256 characters.

Total Physical Memory The total physical memory (in kilobytes) of the operation system (supported for JVM version 1.5 and higher). The valid format is a positive integer or N/A if this attribute is not applicable.

Total Swap Space Size The total swap space size (in kilobytes) of the operating system (supported for JVM version 1.5 and higher). The valid format is a positive integer or N/A if this attribute is not applicable.

- Organization of the predefined workspaces

- Attribute groups used by the predefined workspaces

JDK - Memory attributes

The **JDK - Memory** attributes provide the memory usage information of the operating system on which the J2SE application server is running. This includes heap memory information, heap memory usage information, and pending objects. The data for attributes is gathered from JVM MBeans, which are supported in JVM version 1.5 and higher. No data is available for JVM with versions lower than 1.5.

The attributes within this group are used to build the "JVM Statistics workspace" on page 441.

Committed Heap Memory Size The amount of committed heap memory (in kilobytes) allocated to the JVM (supported for JVM version 1.5 and higher). The valid format is a positive integer.

Committed Non Heap Memory Size The amount of committed non-heap memory (in kilobytes) allocated to the JVM (supported for JVM version 1.5 and higher). The valid format is a positive integer.

Initial Heap Memory Size The initial amount of the heap memory (in kilobytes) for the JVM of the J2SE application server (supported for JVM version 1.5 and higher). The valid format is a positive integer.

Initial Non Heap Memory Size The initial amount of the non-heap memory (in kilobytes) for the JVM of the J2SE application server (supported for JVM version 1.5 and higher). The valid format is a positive integer.

Interval (sec) The length of the interval in seconds (supported for JVM version 1.5 and higher). The valid format is a positive integer.

Maximum Heap Memory Size The maximum amount of the heap memory (in kilobytes) used by the JVM of the J2SE application server (supported for JVM version 1.5 and higher). The valid format is a positive integer.

Maximum Non Heap Memory Size The maximum amount of the non-heap memory (in kilobytes) used by the JVM of the J2SE application server (supported for JVM version 1.5 and higher). The valid format is a positive integer.

Node Name The name of the system on which the server is running (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 256 characters.

Object Pending Finalization Count The number of objects that are not finalized (supported for JVM version 1.5 and higher). The valid format is a positive integer.

Origin Node The name of the server subnode (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 128 characters.

Sample Date and Time The date and time that the monitoring agent collected data (supported for JVM version 1.5 and higher). The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 107. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 256 characters.

Used Heap Memory Size The amount of heap memory (in kilobytes) used by the JVM of the J2SE application server (supported for JVM version 1.5 and higher). The valid format is a positive integer.

Used Non Heap Memory Size The amount of non-heap memory (in kilobytes) used by the JVM of the J2SE application server (supported for JVM version 1.5 and higher). The valid format is a positive integer.

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

JDK - JVM attributes

The **JDK - JVM** attributes provide overall information about the Java Virtual Machine (JVM) that the J2SE application server is using. This information includes the information about JVM name, version, and uptime. The data for attributes is gathered from JVM MBeans, which are supported in JVM version 1.5 and higher. No data is available for JVM with versions lower than 1.5.

The attributes within this group are used to build the “JVM Statistics workspace” on page 441.

Formatted Uptime The time with a specific format during which the Java Virtual Machine is running (supported for JVM version 1.5 and higher). The format is DDd HHh MMm SSs; For example, 1d 2 h 44 m 23 s.

Interval (sec) The length of the interval in seconds (supported for JVM version 1.5 and higher). The valid format is a positive integer.

JVM Name The name of the Java Virtual Machine (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 256 characters.

JVM Vendor The producer of the Java Virtual Machine (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 256 characters.

JVM Version The version of the Java Virtual Machine (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 256 characters.

Node Name The name of the system on which the server is running (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 128 characters.

Sample Date and Time The date and time that the monitoring agent collected data (supported for JVM version 1.5 and higher). The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 108. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 256 characters.

Start Time The date and time when the Java Virtual Machine was started (supported for JVM version 1.5 and higher). The valid format is a 12-character timestamp. This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Uptime The amount of time (in seconds) the JVM has been running (supported for JVM version 1.5 and higher). The valid format is a positive integer.

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

JDK - Threading attributes

The **JDK - Threading** attributes provide overall information about the threads, including peak thread and daemon thread. A thread is the basic unit of program execution in the Java Virtual Machine. A process can have several threads running concurrently, each performing a different job. When a thread has finished its job, it is suspended or destroyed. The data for attributes is gathered from JVM MBeans, which are supported in JVM version 1.5 and higher. No data is available for JVM with versions lower than 1.5.

The attributes within this group are used to build the "JVM Statistics workspace" on page 441.

Current Thread CPU Time The CPU time (in seconds) used to process the current thread (supported for JVM version 1.5 and higher). The valid format is a positive integer.

Current Thread User Time The user time (in seconds) used for the current thread (supported for JVM version 1.5 and higher). The valid format is a positive integer.

Daemon Thread Count The number of threads which run unattended to perform continuous or periodic functions (supported for JVM version 1.5 and higher). The valid format is a positive integer.

Interval (sec) The length of the interval in seconds (supported for JVM version 1.5 and higher). The valid format is a positive integer.

Node Name The name of the system on which the server is running (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 128 characters.

Peak Thread Count The maximum number of threads executed in the Java Virtual Machine (supported for JVM version 1.5 and higher). The valid format is a positive integer.

Sample Date and Time The date and time that the monitoring agent collected data (supported for JVM version 1.5 and higher). The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 109. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server (supported for JVM version 1.5 and higher). The valid format is an alphanumeric string, with a maximum of 256 characters.

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

JMS Sessions - WebLogic attributes

The **JMS Sessions - WebLogic** attribute group provides statistic for JMS session in WebLogic application server.

The attributes within this group are used to build the "JMS Sessions workspace" on page 439.

Acknowledge Mode The acknowledge mode. The valid format is an alphanumeric string, with a maximum of 64 characters.

Bytes Received The number of bytes received by this session since the previous sample. The valid format is a positive integer.

Byte Receive Rate The number of bytes received by this session per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Bytes Sent The number of bytes sent by this session since the previous sample. The valid format is a positive integer.

Byte Send Rate The number of bytes sent by this session per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Connection Name The name of the connection. The valid format is an alphanumeric string, with a maximum of 128 characters.

Consumers Created The number of consumers instantiated by this session since the previous sample. The valid format is a positive integer.

Consumer Creation Rate The number of consumers instantiated by this session per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Current Bytes Pending The number of bytes pending (uncommitted and unacknowledged) for this session. The valid format is a positive integer.

Current Consumers The current number of consumers for this session. The valid format is a positive integer.

Current Messages Pending The number of messages pending (uncommitted and unacknowledged) for this session. The valid format is a positive integer.

Current Producers The current number of producers for this session. The valid format is a positive integer.

Highest Consumers The peak number of consumers for this session since the last reset. The valid format is a positive integer.

Highest Producers The peak number of producers for this session since the last reset. The valid format is a positive integer.

Interval (sec) The length of the interval in seconds. The valid format is a positive integer.

Is Transacted Whether the session is transacted. Valid values are Yes and No.

Messages Received The number of messages received by this session since the previous sample. The valid format is a positive integer.

Message Receive Rate The number of messages received by this session per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Messages Sent The number of messages sent by this session since the previous sample. The valid format is a positive integer.

Message Send Rate The number of messages sent by this session per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Row Number The row number. The valid format is a positive integer.

Producers Created The number of producers for this session created since the previous sample. The valid format is a positive integer.

Producer Creation Rate The number of producers for this session created per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 110. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour

Table 110. Format of the 12-character timestamp (continued)

Character String	Meaning
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Session Name The name of the session. The valid format is an alphanumeric string, with a maximum of 128 characters.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

JMS Summary - J2EE attributes

The **JMS Summary - J2EE** attributes provide information about how J2EE Application Server applications are interacting with messaging middleware (J2EE MQ) using the Java Messaging Service (JMS). It provides such information as which queue managers and queues are being used and how many messages are being read and written.

The attributes within this group are used to build the JMS Summary workspace.

Important: The attributes within this attribute group contain meaningful values only if your site has set the request data monitoring level to Level2 to collect data on JMS requests.

Application ID The unique identifier that is assigned automatically when the application is first configured and is preserved during the whole application life cycle. The valid format is a positive integer.

Average Processing Time (ms) The average time (in milliseconds) per request using the JMS. The valid format is a decimal (formatted to three decimal places).

Browse Average Time (ms) The average time (in milliseconds) that it takes for each browse request from the queue to be processed. The valid format is a decimal (formatted to three decimal places).

Browse Count The number of messages browsed from the queue. The valid format is a positive integer.

Browse Rate (per sec) The number of messages (per second) browsed from a JMS queue. The valid format is a decimal (formatted to three decimal places).

Browse Total Time (ms) The total time (in milliseconds) used by browse requests from the queue. The valid format is a positive integer.

Full Name The complete name of the message queue, which consists of the queue manager name concatenated to the queue name and separated by a slash. The valid format is an alphanumeric string, with a maximum of 100 characters.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

JMS Connection Label A shortened version of the full name. The valid format is an alphanumeric string, with a maximum of 12 characters.

Manager Name The name of the J2EE MQ queue manager (not supported currently). This attribute is blank now. The valid format is an alphanumeric string, with a maximum of 48 characters.

Name The name of the J2EE MQ queue. The valid format is an alphanumeric string, with a maximum of 48 characters.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the application server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The unique identifier of the JVM process (the class ID of the JVM). The valid format is a positive integer.

Publish Average Time (ms) The average time (in milliseconds) that it takes for each publish request to be sent to the queue. The valid format is a decimal (formatted to three decimal places).

Publish Count The number of publish requests sent to the queue. The valid format is a positive integer.

Publish Rate (per sec) The number of publish requests (per second) sent to a JMS queue. The valid format is a decimal (formatted to three decimal places).

Publish Total Time (ms) The total time (in milliseconds) used by all publish requests for the queue. The valid format is a positive integer.

Receive Average Time (ms) The average time (in milliseconds) for each get from the queue. The valid format is a decimal (formatted to three decimal places).

Receive Count The number of destructive gets from the queue. The valid format is a positive integer.

Receive Rate (per sec) The number of destructive gets (per second) made from the queue. The valid format is a decimal (formatted to three decimal places).

Receive Total Time (ms) The total time (in milliseconds) consumed by gets from the queue. The valid format is a positive integer.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 111. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Send Average Time (ms) The average time (in milliseconds) for each put to the queue. The valid format is a decimal (formatted to three decimal places).

Send Count The number of messages put to the queue. The valid format is a positive integer.

Send Rate (per sec) The number of messages (per second) put to the queue. The valid format is a decimal (formatted to three decimal places).

Send Total Time (ms) The total time (in milliseconds) consumed by puts to the queue. The valid format is a positive integer.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Total Time (ms) The total time (in milliseconds) spent accessing the queue. The valid format is a positive integer.

Type The type of message manager. The valid values are Queue and Topic.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Java Transaction Service - WebLogic attributes

The **Java Transaction Service - WebLogic** attributes provides statistics within a WebLogic server.

The attributes within this group are used to build the "JTA Resources workspace" on page 440.

Committed Transactions Time (ms) The summary number of seconds for all committed transactions since the previous sample. The valid format is a positive integer.

Current Active Transactions The number of active transactions on the server. The valid format is a positive integer.

Health State The health state of the JTA subsystem. Valid values are Warning, Critical, and Failed.

Health Reason Code The reason code of the health of the JTA subsystem. The valid format is an alphanumeric string, with a maximum of 128 characters.

Interval (sec) The length of the interval in seconds. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Row Number The row number. The valid format is a positive integer.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 112. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Transactions Abandoned The number of transactions that were abandoned since the previous sample. The valid format is a positive integer.

Transaction Abandon Rate The number of transactions that were abandoned per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Transactions Committed The number of committed transactions since the previous sample. The valid format is a positive integer.

Transaction Commit Rate The number of committed transactions per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Transaction Heuristic Completions The number of transactions that completed with a heuristic status since the previous sample. The valid format is a positive integer.

Transaction Heuristic Completion Rate The number of transactions that completed with a heuristic status per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Transactions Processed The number of transactions proceeded since the previous sample. The valid format is a positive integer.

Transaction Process Rate The number of transactions processed per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Transaction Rolled Back The number of transactions that were rolled back since the previous sample. The valid format is a positive integer.

Transaction Rolled Back by Application The number of transactions that were rolled back due to an application error since the previous sample. The valid format is a positive integer.

Transaction Rolled Back by Application Percent The percent of transactions that were rolled back due to an application error. The valid format is a decimal (formatted to one decimal place).

Transaction Rolled Back by Resource The number of transactions that were rolled back due to a resource error since the previous sample. The valid format is a positive integer.

Transactions Rolled Back by Resource Percent The percent of transactions that were rolled back due to a resource error since the previous sample. The valid format is a decimal (formatted to one decimal place).

Transactions Rolled Back by System The number of transactions that were rolled back due to an internal system error since the previous sample. The valid format is a positive integer.

Transactions Rolled Back by System Percent The percent of transactions that were rolled back due to an internal system error since the previous sample. The valid format is a decimal (formatted to one decimal place).

Transactions Rolled Back by Timeout The number of transactions that were rolled back since the previous sample due to a timeout expiration. The valid format is a positive integer.

Transaction Rolled Back by Timeout Percent The percent of transactions that were rolled back due to a timeout expiration since the previous sample. The valid format is a decimal (formatted to one decimal place).

Transaction Rollback Rate The number of transactions that were rolled back per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

JTA Resources - J2EE attributes

The **JTA Resources - J2EE** attributes group collects information about the Java Transaction API (JTA) Resources.

The attributes within this group are used to build the "JTA Resources workspace" on page 440.

Active Count The number of active transactions. The valid format is a positive integer.

Committed Count The number of committed transactions. The valid format is a positive integer.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

JTA Resource The name of the JTA Resources. The valid format is an alphanumeric string, with a maximum of 256 characters.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Rollback Count The number of Rollback transactions. The valid format is a positive integer.

Row Number The row number. The valid format is a positive integer.

For additional information, see:

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 113. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

JTA Summary - NetWeaver attributes

The **JTA Summary - NetWeaver** attributes provide Transaction Service performance data.

The attributes within this group are used to build the "JTA Summary workspace" on page 441.

Active Transactions Count The number of active transactions. The valid format is a positive integer.

Committed Transactions Count The number of transactions that have been committed. The valid format is a positive integer.

Interval (sec) The length of the interval in seconds. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Rolled Back Transactions Count The number of transactions that have been rolled back. The valid format is a positive integer.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 114. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Suspended Transactions Count The number of suspended transactions. The valid format is a positive integer.

Timeouted Transactions Count The number of transactions that have timed out.
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Log Analysis - J2EE attributes

The **Log Analysis - J2EE** attributes provide application server error and exception conditions as recorded in the application server log file. The log file is SystemOut.log. Use the Log Analysis attributes in situations to monitor errors and exception conditions and their severity.

The attributes within this group are used to build the Log Analysis workspace .

Component The name of the component that caused the error. The valid format is an alphanumeric string, with a maximum of 32 characters.

Event Date and Time The date and time when the event occurred. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 115. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Job ASID The identifier assigned to the address space running this servant region. The valid format is an alphanumeric string, with a maximum of four characters.

Job Name Where the message originates; that is, the log file name and line number. The valid format is an alphanumeric string, with a maximum of eight characters.

Message ID The identifier assigned to the message. The valid format is an alphanumeric string, with a maximum of 12 characters.

Message Origin Where the message originates; that is, the log file name and line number. The valid format is an alphanumeric string, with a maximum of 32 characters.

Message Text The text of the error message. The valid format is alphanumeric string, with a maximum of 256 characters. All error message text data that goes beyond 256 characters is truncated and not shown in the portal.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The process identifier of the Java virtual machine. The valid format is an alphanumeric sting, with a maximum of eight characters.

Sequence Number The sequence number in JMX notifications stream. The valid format is a positive integer.

Server Instance Name The name of the application server instance. This is the name of a single address space that can run application code (called a "specific server" or simply a "server") . The valid format is an alphanumeric string, with a maximum of eight characters.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Severity The severity of the message. The valid values are shown in the following table:

Table 116. Message severities and their meanings

Severity	Definition
Informational	A message intended to convey only user information
Unconditional	A message of type Unconditional
Dump	A message of type Dump
SystemOut	A message written directly to System.out by the user application or internal components
SystemError	A message written directly to System.err by the user application or internal components
User	A message of type user
EntryMethod	A message written upon entry to a method
ExitMethod	A message written upon exit from a method
Event	A message of type Event
Debug	A message of type Debug
Audit	An audit message
Warning	A warning message
Error	An error message

Table 116. Message severities and their meanings (continued)

Severity	Definition
Terminate	A message of type Terminate (exit process)
Fatal	A fatal message
Unknown	A placeholder that indicates the message type was not recognized

Thread ID The unique identifier of the thread where the event occurred. The valid format is an alphanumeric string, maximum 16 characters.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces
- "Situations for ITCAM Agent for J2EE" on page 528

Request Analysis - J2EE attributes

The **Request Analysis - J2EE** attributes provide response times and functional decomposition information about requests (servlets, JSPs, and EJB methods) that ran on the application server.

The attributes within this group are used to build the Request Analysis workspace .

Application Name The name of the application to which the request belongs. The valid format is an alphanumeric string, with a maximum of 256 characters.

Application Time (ms) The average time (in milliseconds) this request spent processing application requests other than JCA, JMS, JNDI, and JDBC requests. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

Application Time (% of Average Response) The percentage of time this request spent processing application requests other than JCA, JMS, JNDI, and JDBC requests. The valid format is a decimal (formatted to one decimal place).

Application Bad Delay (msec) The delay time (in milliseconds) in the application tier collected during the interval. This column is non-zero value when application delay exceeds the bad threshold configured for it. The valid format is a positive integer.

Application Fair Delay (msec) The delay time (in milliseconds) in the application tier collected during the interval. This column is non-zero value when application delay exceeds the fair threshold configured for it. The valid format is a positive integer.

Application Good Delay (msec) The delay time (in milliseconds) in the application tier collected during the interval. This column is non-zero when application delay is less than fair threshold configured for it. The valid format is a positive integer.

Application Tier Delay Type This attribute defines the request type based on its delay time in the application tier. Valid values are Unknown, Good, Fair, and Bad.

Application Tier Response (msec) The actual response time in milliseconds in the application tier collected during the interval. The valid format is a positive integer.

Average Response (ms) The average time (in milliseconds) required each time this request ran during the interval. The valid format is a positive integer.

Backend Bad Delay (msec) The delay time (in milliseconds) in the backend tier collected during the interval. This column is non-zero value when backend delay exceeds the bad threshold configured for it. The valid format is a positive integer.

Backend Fair Delay (msec) The delay time (in milliseconds) in the backend tier collected during the interval. This column is non-zero value when backend delay exceeds the fair threshold configured for it. The valid format is a positive integer.

Backend Good Delay (msec) The delay time (in milliseconds) in the backend tier collected during the interval. This column is non-zero when backend delay is less than fair threshold configured for it. The valid format is a positive integer.

Backend Tier Delay Type This attribute defines the request type based on its delay time in the backend tier. Valid values are Unknown, Good, Fair, and Bad.

Backend Tier Response (msec) The actual response time in milliseconds in the backend tier collected during the interval. The valid format is a positive integer.

Client Bad Delay (msec) The delay time (in milliseconds) in the client tier collected during the interval. This column is non-zero value when client delay exceeds the bad threshold configured for it. The valid format is a positive integer.

Client Fair Delay (msec) The delay time (in milliseconds) in the client tier collected during the interval. This column is non-zero value when client delay exceeds the fair threshold configured for it. The valid format is a positive integer.

Client Good Delay (msec) The delay time (in milliseconds) in the client tier collected during the interval. This column is non-zero when client delay is less than fair threshold configured for it. The valid format is a positive integer.

Client Tier Delay Type This attribute defines the request type based on its delay time in the client tier. Valid values are Unknown, Good, Fair, and Bad.

Client Tier Response (msec) The actual response time in milliseconds in the client tier collected during the interval. The valid format is a positive integer.

Completion Count The number of requests that successfully completed during the interval. The valid format is a positive integer.

Custom Request Count The number of custom requests. The valid format is a positive integer.

Custom Request Time (ms) The average time (in milliseconds) the custom requests spent. The valid format is a positive integer.

Custom Request Time (%) The percentage of time the custom requests spent. The valid format is a decimal (formatted to one decimal place).

EJB Count The number of times this request invoked an Enterprise Java Bean (EJB) request. The valid format is a positive integer.

EJB Time (ms) The average time (in milliseconds) this request spent processing Enterprise Java Bean (EJB) requests. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

EJB Time (%) The percentage of time this request spent processing Enterprise Java Bean (EJB) requests. The valid format is a decimal (formatted to one decimal place).

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

JCA Count The number of times this request invoked a J2EE Connector Architecture (JCA) request. The valid format is a positive integer.

JCA Time (ms) The average time (in milliseconds) this request spent processing J2EE Connector Architecture (JCA) requests. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

JCA Time (%) The percentage of time this request spent processing J2EE Connector Architecture (JCA) requests. The valid format is a decimal (formatted to one decimal place).

JMS Count The number of times this request invoked a Java Message Service (JMS) request. The valid format is a positive integer.

JMS Time (ms) The average time (in milliseconds) this request spent processing Java Message Service (JMS) requests. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

JMS Time (%) The percentage of time this request spent processing Java Message Service (JMS) requests. The valid format is a decimal (formatted to one decimal place).

JNDI Count The number of times this request invoked a Java Naming and Directory Interface (JNDI) request. The valid format is a positive integer.

JNDI Time (ms) The average time (in milliseconds) this request spent processing Java Naming and Directory Interface (JNDI) requests. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

JNDI Time (%) The percentage of time this request spent processing Java Naming and Directory Interface (JNDI) requests. The valid format is a decimal (formatted to one decimal place).

Longest Response (ms) The maximum time (in milliseconds) it took this request to run during the interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the application server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The process identifier of the Java virtual machine. The valid format is a positive integer.

Request Bad Response Threshold (msec) The threshold that defines the bad requests. A request that spends more time to complete than this threshold to complete is a bad request. The valid format is a positive integer.

Request Completion (%) The percentage of the requests that completed successfully during the interval. The valid format is a positive integer.

Request Completion Level The completion level of the requests during the interval. Valid values are Unknown, Good, Fair, and Bad.

Request Count The number of times this request ran during the interval. The valid format is a positive integer.

Request Detail The URI for servlet requests, or the method name for EJBs. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Delay Type The type of the request delay. Valid values are Unknown, Good, Fair, and Bad.

Request Fair Response Threshold (msec) The threshold that defines the fair requests. A request that spends more time than this threshold and less time than the *Request Bad Response Threshold (msec)* attribute to complete is a fair request. The valid format is a positive integer.

Request Bad Delay (msec) The delay time (in milliseconds) collected during the interval. This column is non-zero value when the whole request response time exceeds the bad threshold configured for it. The valid format is a positive integer.

Request Fair Delay (msec) The delay time (in milliseconds) collected during the interval. This column is non-zero value when the whole request response time exceeds the fair threshold configured for it. The valid format is a positive integer.

Request Good Delay (msec) The delay time (in milliseconds) collected during the interval. This column is non-zero value when the whole request response time is less than fair threshold configured for it. The valid format is a positive integer.

Request Label A shortened version of Request Name, used to display the request name in the chart view. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Name The URL for servlet requests, or the fully qualified class name for EJBs. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Rate (per sec) The number of requests completed per second during the interval. If the sampling rate is less than 100%, this number is extrapolated to estimate 100% of completed requests. The valid format is a decimal (formatted to three decimal places).

Request Type The type of request being run. Valid values are Servlet, EJB_Method, Custom, All_Workloads, Unknown, and Portlet.

Sample Date and Time The date and time the Tivoli Enterprise Management Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 117. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Sampling Rate (%) The percentage of requests being sampled. The valid format is a positive integer.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Servlet Count The number of times this request invoked a Servlet request. The valid format is a positive integer.

Servlet Time (ms) The average time (in milliseconds) this request spent processing Servlet requests. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

Servlet Time (%) The percentage of time this request spent processing Servlet requests. The valid format is a decimal (formatted to one decimal place).

SQL Connect Count The number of times this request connected to a JDBC database. The valid format is a positive integer.

SQL Connect Time (ms) The average time (in milliseconds) this request spent connecting to a JDBC database. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

SQL Connect Time (%) The percentage of time this request spent connecting to a JDBC database. The valid format is a decimal (formatted to one decimal place).

SQL Execute Count The number of times this request executed a JDBC database. The valid format is a positive integer.

SQL Execute Time (ms) The average time (in milliseconds) this request spent executing a JDBC database. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

SQL Execute Time (%) The percentage of time this request spent executing a JDBC database. The valid format is a decimal (formatted to one decimal place).

SQL Query Count The number of times this request queried a JDBC database. The valid format is a positive integer.

SQL Query Time (ms) The average time (in milliseconds) this request spent querying a JDBC database. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

SQL Query Time (%) The percentage of time this request spent querying a JDBC database. The valid format is a decimal (formatted to one decimal place).

SQL Update Count The number of times this request updated a JDBC database. The valid format is a positive integer.

SQL Update Time (ms) The average time (in milliseconds) this request spent updating a JDBC database. This field can have a zero value if the total time is less than the number of requests, due to truncation. The valid format is a positive integer.

SQL Update Time (%) The percentage of time this request spent updating a JDBC database. The valid format is a decimal (formatted to one decimal place).

Total Time (ms) The total CPU time (in milliseconds) this request consumed during the interval. The valid format is a positive integer.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Requests Monitoring Configuration attributes

The **Requests Monitoring Configuration** attributes provide information for all requests monitored in application. Use these attributes to monitor application edge requests. The agent supports three types of edge requests, Servlet/JSP, EJB, and Portal.

The attributes within this group are used to build the Request Baseline workspace.

Application Name The name of the application to which the request belongs. The valid format is an alphanumeric string, with a maximum of 256 characters.

Application ID The unique identifier that is assigned automatically when the application is first configured and is preserved during the whole application life cycle. The valid format is a positive integer.

Application Tier Threshold (msec) The response time threshold in the application tier in milliseconds. The valid format is a positive integer.

Auto Threshold Bad Projection (%) The bad response time projection used for auto threshold. The valid format is a positive integer.

Auto Threshold Fair Ratio The percentage to derive the fair response time threshold from the baseline selection. The valid format is a positive integer.

Auto Threshold Fair Projection (%) The fair response time projection used for auto thresholds. The valid format is a positive integer.

Auto Threshold Mode The request auto threshold mode. Valid values are Default, Custom, and Disabled.

Auto Threshold Deviation (%) The maximum allowed deviation of requests baseline data used for auto threshold. The valid format is a positive integer.

Auto Threshold Percent (%) The minimum percent of requests baseline data used for auto threshold. The valid format is a positive integer.

Backend Tier Threshold (msec) The response time threshold in the backend tier in milliseconds. The valid format is a positive integer.

Bad Response Threshold (msec) The time (in milliseconds) that defines the bad requests. A request that spends more time than this threshold to complete is a bad request. Use this attribute with `Fair Response Threshold (msec)` attribute and `Fair Response Zone (msec)` attribute. The valid format is a positive integer.

Bad Errors Rate Threshold The value of bad error rate percentage. The valid format is a positive integer.

Client Tier Threshold (msec) The response time threshold in the client tier in milliseconds. The valid format is a positive integer.

Fair Response Threshold (msec) The time (in milliseconds) that defines the fair requests. A request that spends less time than this threshold to complete is a good request. Use this attribute with `Fair Response Zone (msec)` attribute and `Bad Response Threshold (msec)` attribute. The valid format is a positive integer.

Fair Response Zone (msec) The time span (in milliseconds) that defines the fair requests. This time span is between the fair response time threshold and the bad time threshold. If the response time of a request falls into this time span, the request is a fair request. Use this attribute with `Fair Response Threshold (msec)` attribute and `Bad Response Threshold (msec)` attribute. The valid format is a positive integer.

Fair Errors Rate Threshold The value of fair error rate percentage. The valid format is a positive integer.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Detail The request detail name. The valid format is an alphanumeric string, with a maximum of 256 characters.

Request ID The unique identifier of the request that belongs to the application. The valid format is a positive integer.

Request Label A shortened version of Request Name, used to display the request name in the chart view. The valid format is an alphanumeric string, with a maximum of 24 characters.

Request Name The URL for servlet requests, or the fully qualified class name for EJBs. The valid format is an alphanumeric string, with a maximum of 256 characters.

Request Type The type of request being run. Valid values are All, Servlet/JSP, EJB, and Portal.

Sample Date and Time The date and time the Tivoli Enterprise Management Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 118. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Request Times and Rates - J2EE attributes

The **Request Times and Rates - J2EE** attribute group provides information about historical request throughput and average response time for a particular application server.

The attributes within this group are used to build the J2EE application servers workspaces.

Application Name The name of the application to which the request belongs. The valid format is an alphanumeric string, with a maximum of 256 characters.

Average Load The average number of concurrent requests during the interval. The valid format is a decimal (formatted to three decimal places).

Average Request Completion Rate The average request completion rate (that is, the request throughput). If the sampling rate is less than 100%, this number is extrapolated to estimate 100% of completed requests. The valid format is a positive integer.

Average Request Response Time (ms) The average request response time, in milliseconds. The valid format is a positive integer.

Error Rate (%) The error rate of the request during the interval. The valid format is a decimal (formatted to three decimal places).

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Count The number of times this request ran during the interval. The valid format is a positive integer.

Request Type The type of request being run. Valid values are Servlet, EJB_Method, Custom, All_Workloads, Unknown, and Portlet.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 119. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Sampling Rate (%) The percentage of edge requests-such as servlets and JSPs that were sampled during the interval. The valid format is a positive integer.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Total (ms) The total time. The valid format is a decimal (formatted to three decimal places).

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Selected Request - J2EE attributes

The **Selected Request - J2EE** attribute group provides detailed information about transaction requests for database (that is, JDBC), messaging (that is, JMS), or EIS (that is, JCA) services.

The attributes within this group are used to build these workspaces:
- "Selected Request - data sources workspace" on page 449
- "Selected Request - JMS Queues workspace" on page 450
- "Selected Request - Resource Adapters workspace" on page 450

Note: The attributes within this attribute group contain meaningful values only if your site has set the request data monitoring level to Level2 to collect data on nested requests.

Activity Category The type of request. Valid values are n/a (not applicable), JDBC, JMS, and JCA.

Activity Detail Detailed information about the activity performed by the selected request, for example, the SQL statement being processed. The valid format is an alphanumeric string, maximum 128 characters.

Activity Label An abbreviated version of Activity Name, used to display the activity name in the chart view. The valid format is an alphanumeric string, with a maximum of 128 characters.

Activity Name The resource that the request is accessing, for example, the data source name. The valid format is an alphanumeric string, with a maximum of 128 characters.

Activity Type The type of the resource being requested. Valid values display in the following table:

Table 120. Activity types

Type	Definition
n/a	not applicable
Servlet	A call to the doGet or doPost methods of a server
EJB_Method_Call	A call to a business method for an EJB class
Obtain_SQL_Connection_from_Datasource	A call to obtain a connection from a JDBC data source
SQL_Query	A Query request to a JDBC data source

Table 120. Activity types (continued)

Type	Definition
SQL_Update	An Update request to a JDBC data source
SQL_Other	Any other request to a JDBC data source
JMS_Message_Browse	A call to browse a message from a JMS queue
JMS_Message_Get	A call to receive a message from a JMS queue (that is, a destructive get)
JMS_Message_Put	A call to put a message from a JMS queue
JMS_Publish_Message	A call to publish a publication to a JMS queue
JCA_CCI_Execute_interaction	A request by a J2EE application to execute a JCA interaction (a JDBC, JMS, or other JCA-supported operation) against a backend system
JNDI_Lookup	A call to JNDI to build an Initial Context or to perform a lookup
Unknown	The activity type cannot be determined

Average Response (ms) The average time (in milliseconds) executing this request, per occurrence. The valid format is a decimal (formatted to one decimal place).

Delay (%) The percentage of execution time this activity consumed on average when processing this request. The valid format is a decimal (formatted to one decimal place).

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Longest Response (ms) The worst-case response time (in milliseconds) experienced by this request. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Occurrences The number of occurrences. The valid format is a positive integer.

Origin Node The name of the application server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The unique identifier of the JVM process (the class ID of the JVM). The valid format is a positive integer.

Request Detail The URI for servlet requests, or the method name for EJBs. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Name The URL for servlet requests, or the fully qualified class name for EJBs. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Type The type of transaction being run. Valid values are Servlet and EJB_Method, Custom, All_Workloads, Unknown, Portlet.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the

STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 121. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Sampling Rate (%) The percentage of edge requests-such as servlets and JSPs-that were sampled for nested requests during the interval. The valid format is a positive integer.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Total Time (ms) The total CPU time (in milliseconds) consumed by this request. The valid format is a positive integer.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Servlets JSPs - J2EE attributes

The **Servlets JSPs - J2EE** attributes collect performance information for servlets and Java server pages (JSPs).

The attributes within this group are used to build the "Servlets/JSPs - Selected Web Application workspace" on page 452.

Average Response Time (ms) The average servlet service time in milliseconds. The valid format is a decimal (formatted to three decimal places). This attribute might be empty if servlet is not invoked yet.

Error Count The number of servlets that are in error. The valid format is a positive integer.

Interval (sec) The length (in seconds) of the interval. The valid format is a positive integer.

Invocation Count The number of invocations. The valid format is a positive integer. This attribute might be empty if servlet is not invoked yet.

Max Time (ms) The longest service time in milliseconds. The valid format is a decimal (formatted to three decimal places).

Min Time (ms) The shortest service time in milliseconds. The valid format is a decimal (formatted to three decimal places).

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Row Number The row number. The valid format is a positive integer.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 122. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Servlet/JSP Name The name of the web application. The valid format is an alphanumeric string, with a maximum of 128 characters.

Total Time (ms) The total service time in milliseconds. The valid format is a decimal (formatted to three decimal places).

Web Application Name The name of the web application. The valid format is an alphanumeric string, with a maximum of 128 characters.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Servlets and JSPs - WebLogic attributes

The **Servlets and JSPs - WebLogic** attributes provide performance information for servlets and JavaServer pages (JSPs).

The attributes within this group are used to build the "Servlets/JSPs - Selected Enterprise Application workspace" on page 451.

Average Execution Time (ms) The average amount of time (in milliseconds) the invocations of the servlet have executed for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Context Path The context path. The valid format is an alphanumeric string, with a maximum of 256 characters.

Cumulative Average Execution Time (ms) The average amount of time (in milliseconds) all invocations of the servlet have executed since created. The valid format is a positive integer.

Enterprise Application Name The J2EE application name. The valid format is an alphanumeric string, with a maximum of 128 characters.

Execution Time (ms) The amount of time (in milliseconds) all invocations of the servlet has executed since the previous sample. The valid format is a positive integer.

Highest Execution Time (ms) The amount of time (in milliseconds) the single longest invocation of the servlets has executed since created. The valid format is a positive integer.

Interval (sec) The length of the interval in seconds. The valid format is a positive integer.

Invocations The number of times the servlet has been invoked since the previous sample. The valid format is a positive integer.

Invocation Rate The number of times the servlet has been invoked per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Lowest Execution Time (ms) The amount of time (in milliseconds) the single shortest invocation of the servlet has executed since created. The valid format is a positive integer.

Maximum Pool Capacity The maximum capacity of this servlet for single thread model servlets. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Reloads The number of times the servlet has been reloaded for interval since the previous sample. The valid format is a positive integer.

Reload Rate The number of times the servlet has been reloaded per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Row Number The row number. The valid format is a positive integer.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 123. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Servlet Name The servlet or JSP name. The valid format is an alphanumeric string, with a maximum of 128 characters.

Servlet Path The servlet path. The valid format is an alphanumeric string, with a maximum of 256 characters.

Web Application Name The web application component name. The valid format is an alphanumeric string, with a maximum of 128 characters.

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Web Container - NetWeaver attributes

The **Web Container - NetWeaver** attributes collect performance information about servlets and Java Server pages (JSPs).

The attributes within this group are used to build the “Web Container workspace” on page 454.

All Requests Count The number of all requests since server startup. The valid format is a positive integer.

Current Http Sessions The number of the currently valid http sessions. The valid format is a positive integer.

Current Security Sessions The number of the currently valid security sessions created for http clients. The valid format is a positive integer.

Interval (sec) The length of the interval in seconds. The valid format is a positive integer.

Invalidated Http Sessions The number of http sessions invalidated by application. The valid format is a positive integer.

Invalidated Security Sessions The number of security sessions which have been invalidated by application. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 124. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Timed Out Http Sessions The number of http sessions which have timed out. The valid format is a positive integer.

Timed Out Security Sessions The number of security sessions which have timed out. The valid format is a positive integer.

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Web Applications - J2EE attributes

The **Web Applications - J2EE** attributes provide aggregated information for each Web application and for the application server running that application. This

performance data describes all servlets and JSPs deployed to that Web application as well as performance data for all servlets and JSPs running in the application server. Examples include the number of loaded servlets and JSPs and total requests. Use the Web Applications - J2EE attributes to create situations that monitor Web application performance and application server loads.

The attributes within this group are used to build the Web Applications workspace.

Average Response Time The average response time of the application, in milliseconds. The valid format is a decimal (formatted to three decimal places). This attribute might be empty if servlet is not invoked yet.

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Invocation Count The total invocation count for application. The valid format is a positive integer. This attribute might be empty if servlet is not invoked yet.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Row Number The row number. The valid format is a positive integer.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 125. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Servlet Count The number of servlets in these web applications. The valid format is a positive integer.

Total Time The total time. The valid format is a decimal (formatted to three decimal places).

Web Application Name The name of the Web application. The valid format is an alphanumeric string, with a maximum of 128 characters.

For additional information, see:
- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Web Applications - WebLogic attributes

The **Web Applications - WebLogic** attributes provide data and aggregated statistics for Web application components.

The attributes within this group are used to build the "Web Applications workspace" on page 453.

Context Root The context root (context path) for the Web application. The valid format is an alphanumeric string, with a maximum of 256 characters.

Current Servlet Sessions The current number of open servlet sessions. The valid format is a positive integer.

Enterprise Application Name The J2EE application name. The valid format is an alphanumeric string, with a maximum of 128 characters.

Highest Servlet Sessions The high water mark of the total number of open sessions in this server. The valid format is a positive integer.

Interval (sec) The length of the interval in seconds. The valid format is a positive integer.

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Row Number The row number. The valid format is a positive integer.

Sample Date and Time The date and time that the monitoring agent for WebLogic Server agent collected data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 126. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data-collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Name The name of the J2EE application server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Servlet Invocation Rate The number of servlet requests per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Session Monitoring Enabled Whether servlet sessions monitoring is enabled. It can be enabled in weblogic.xml. Valid values are Enabled and Disabled.

Servlet Reload Rate The servlets reloads per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Servlet Sessions Opened The number of servlet sessions opened since the previous sample. The valid format is a positive integer.

Servlet Session Creation Rate The number of servlet sessions opened per second for the interval since the previous sample. The valid format is a decimal (formatted to three decimal places).

Status The component status. The valid format is an alphanumeric string, with a maximum of 64 characters.

Web Application Name The web application component name. The valid format is an alphanumeric string, with a maximum of 128 characters.

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Situations for ITCAM Agent for J2EE

ITCAM Agent for J2EE provides 11 predefined situations that you can use to:

- Immediately begin monitoring your J2EE application servers
- Monitor and manage widely dispersed J2EE Application Server resources through localized automation
- Use models for creating your own situations

These predefined situations have an alert status of Critical. When these situations trigger an alert, you can investigate the event by opening its workspace. For example, you can use these situations to monitor a J2EE application server for errors occurring within it or the web applications on your site.

How the situations work

Situations are tests expressed in an IF-TRUE format of system conditions that you want to monitor. The tested value is an ITCAM Agent for J2EE attribute expressed in the form *attribute-group.attribute-name*. Thus, if the specified condition occurs or exists, the situation is true, and an alert is issued.

Avoid using negative values

If you define situations that use a counter or a range of numbers, always provide a threshold or use values in a positive range of numbers. For example, use a greater-than-or-equal-to-zero expression as shown in some of the following predefined situations. Using this expression prevents a situation from falsely tripping. If the ITCAM Agent for J2EE Tivoli Enterprise Monitoring Agent encounters an undefined attribute value, it interprets this value as a negative number and erroneously fires a situation that specified a negative number.

Predefined situations-descriptions and formulas

J2EEServletsJSPsError Monitors the error count for servlets and JSPs invoked by a J2EE Application Server application and issues a Critical condition whenever the count becomes nonzero. The J2SE application server does not support this situation. Its formula is as follows:

If

Servlets_JSPs.Error_Count is greater than 0

then

the situation J2EEServletsJSPsError is true.

J2EEError Monitors the error severity for a single J2EE Application Server and issues a Critical condition whenever that severity is greater than 21. The J2SE application server does not support this situation. Its formula is as follows:

If

Log_Analysis.Severity is greater than 21

then

the situation J2EEError is true.

J2EENotConnected Monitors the connection between the ITCAM for J2EE data collector running in an application server and the ITCAM Agent for J2EE monitoring agent to ensure that the monitoring agent is connected and issues a Critical condition whenever it is not. Its formula is as follows:

If

Application_Server_Status.Status equals 0

then

the situation J2EENotConnected is true.

J2EEOutofHeapSpace Monitors the heap allocation status and issues a Critical condition whenever heap space is exhausted. The formula is as follows:

If

Allocation_Failure.Heap_Status equals 1

then

the situation J2EEOutofHeapSpace is true.

J2EEHighResponseTime Monitors the average request response time and issues a Critical condition whenever that time exceeds 2 seconds. The formula is as follows:

If

Request_Times_and_Rates.Average_Request_Response_Time is greater than 2000

then

the situation J2EEHighResponseTime is true.

J2EEHighCPUPercentUsed Monitors the percentage of the CPU being consumed and issues a Critical condition whenever that time exceeds 80%. The formula is as follows:

If

Application_Server.CPU_Used_Percent is greater than 80

then

the situation J2EEHighCPUPercentUsed is true.

J2EEHighGCTimePercent Monitors the percentage of time being spent by the garbage collector and issues a Critical condition whenever that time exceeds 80%. The formula is as follows:

If

Garbage_Collection_Analysis.Real_Time_Percent is greater than 80

then

the situation J2EEHighGCTimePercent is true.

J2EEAppDiscovered monitors J2EE applications deployed in the application server and issues an Informational alert when a new application is discovered. The monitoring agent checks for new applications each time when it connects to the data collector or when an application is deployed when the data collector is already active. The J2SE application server does not support this situation. The formula is:

If

Application_Monitoring_Configuration.Monitoring_Status equals 0

then

the situation J2EEAppDiscovered is true.

The predefined Take Action command **Start_Baselining** associated with the J2EEAppDiscovered situation enables you to automate the baselining of newly discovered applications.

J2EEAppHealthGood monitors the overall application health and issues an Informational alert when application health is good. The J2SE application server does not support this situation. The formula is:

If

Application_Health_Status.Application_Health equals 1

then

the situation J2EEAppHealthGood is true.

The predefined Take Action command **Set_Appliction_Monitoring** associated with the J2EEAppHealthGood situation lowers the request monitoring level for applications generated alert, and reduces the monitoring overhead.

J2EEAppHealthFair monitors the overall application health and issues a warning alert when application health is fair. The J2SE application server does not support this situation. The formula is:

If

Application_Health_Status.Application_Health equals 2

then

the situation J2EEAppHealthFair is true.

The predefined Take Action command **Set_Appliction_Monitoring** associated with J2EEAppHealthFair situation raises the request monitoring level for applications generated alert, and enables you to collect detailed performance data that helps to pinpoint a bottleneck down to particular application tiers.

J2EEAppHealthBad monitors the overall application health and issues a Critical alert when the application health is bad. The J2SE application server does not support this situation. The formula is:

If

Application_Health_Status.Web_Tier_Health equals 3

then

the situation J2EEAppHealthBad is true.

The predefined Take Action command **Set_Appliction_Monitoring** associated with J2EEAppHealthBad situation increases the request monitoring rate for applications generated alert, and enables you to collect more detailed performance data that helps to collect the most precise data about each application tier health level.

For additional information, see:

"Attributes for ITCAM Agent for J2EE" on page 456

Take Action commands for ITCAM Agent for J2EE

Using the Take Action feature, your interactive Tivoli Enterprise Portal users can enter a command that stops or starts a process at any system in your network where one or more Tivoli Enterprise Monitoring Agents are installed. With the ITCAM Agent for J2EE Take Action commands, you can use the portal interface to start, stop, or recycle a J2EE application server or to control the level of monitoring for the current server.

You can start a Take Action command from a workspace, from the Navigator, from a situation that you create, in an improvised mode, or by recalling a saved Take Action command. For details on using these general features, see the online help for Tivoli Enterprise Portal.

Enable_Auto_Threshold: set threshold parameters

Use the Enable_Auto_Threshold Take Action to set automatic threshold parameters and remove any overrides of the thresholds.

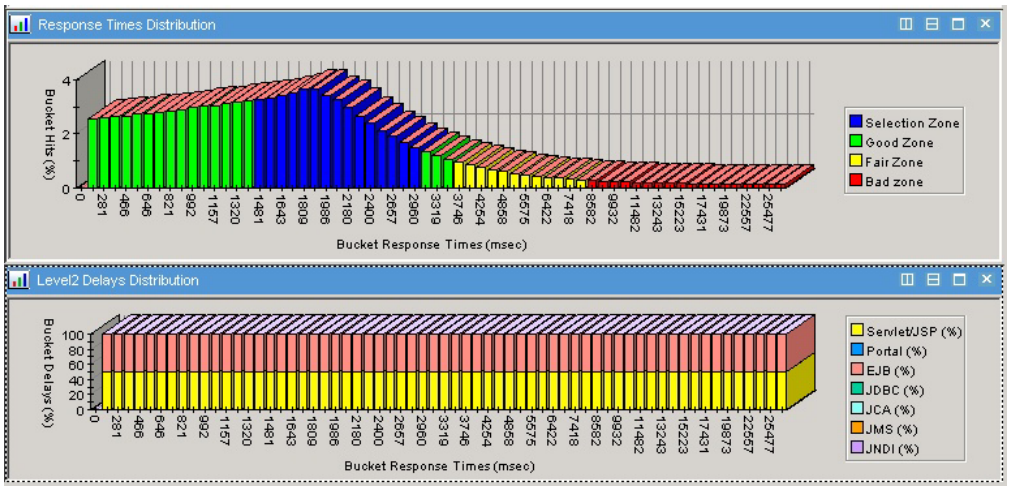
The baselining process supplies statistical information about request response times. ITCAM interprets this information to set automatic thresholds. Several parameters control this interpretation.

The default values for these parameters are sufficient for most cases. However, if the thresholds are not adequate and the baselining process was run recently, you might have to change these parameters. If there are many false alarms or warnings, you must raise the bad or fair threshold. If alarms or warnings are not triggered when needed, you must lower the bad or fair threshold.

Although you can change the parameters for the entire application or for all requests of a given type, usually you do this only for an individual request.

- To set threshold parameters for all requests in the application, select this application in the "Application Health Summary workspace" on page 425 or "Application Registry workspace" on page 426, and select the Enable_Auto_Threshold take action command.
- To set threshold parameters for all requests of a given type in the application, select this request type in the Application Request Configuration table of the "Selected Application - Configuration workspace" on page 446, and select the Enable_Auto_Threshold take action command.
- To set threshold parameters for an individual request, select this request in the "Selected Request - Baseline workspace" on page 445, and select the Enable_Auto_Threshold take action command.

In the "Selected Request - Baseline workspace" on page 445, when you select a line representing a request, you can see the bar charts representing statistical data for this request. This data was gathered during the baselining process. Colors on the bar charts show the way in which the parameters are applied. You can change the parameters using the Enable_Auto_Threshold take action command, and immediately see the effects on the bar charts.



The **Response Times Distribution** chart shows the statistical distribution of response times for this request. To the left are smaller (faster) response times; to the right, larger (slower) ones. The height of every bar shows the percentage of requests that had the indicated response time during the baselining period.

Some bars represent bigger time intervals than others; more bars are devoted to most common response times. For example, if the maximum encountered time is 1000 ms but most response times are 300 - 500 ms, then the first bar might be 0 - 50 ms, but there can also be bars like 305 - 310 ms and 400 - 402 ms.

The blue bars show the zone into which the "typical" response times for this application fall. The green bars show response times that are not "typical", but are below the fair threshold. Response times above the fair threshold but below the bad threshold are shown as yellow bars; for those above the bad threshold, the bars are red.

Use the Enable_Auto_Threshold take action command to set the parameters that affect both the position of the "typical" zone and the way the thresholds are derived from this zone.

For more information about how the bar chart and parameters work, see “Threshold calculation detail” on page 541.

The **Level2 Delays Distribution** chart shows the distribution of time spent in "nested requests" within the requests that had this response time range. Each bar represents a response time of the top-level request (the same as on the top chart). Within this bar, colored sections show how much time is spent within nested requests of different types; the color legend is shown on the bar. ITCAM uses this distribution within the selection zone (that is for typical overall request types) to work out the average share of time taken by each nested request type. When an error or warning arises, ITCAM checks which of the request types takes more than its usual share of time. Based on this, it displays whether the likely cause is the application, backend, or server.

Command syntax

YN:Enable_Auto_Threshold *App_Id Request_Id Auto_Threshold_Percent Auto_Threshold_Deviation Auto_Threshold_Fair_Projection Auto_Threshold_Bad_Projection Use_Default*

Where:

App_Id
The application ID, automatically assigned in the portal from the selection context when Take Action was invoked.

Request_Id
The request ID, automatically assigned in the portal from the selection context when Take Action was invoked.

Auto_Threshold_Percent
Auto_Threshold_Deviation
ITCAM uses these two parameters to calculate the borders of the "typical zone". See “Threshold calculation detail” on page 541.

Auto_Threshold_Fair_Projection
This determines the position of the fair threshold. Increase this parameter to increase the fair threshold; decrease the parameter to decrease the fair threshold. If the parameter is set to 100, the fair threshold is at the right border of the selection zone. For details, see “Threshold calculation detail” on page 541. The bad threshold is not affected.

Auto_Threshold_Bad_Projection
This determines the position of the bad threshold. Increase this parameter to increase the bad threshold; decrease the parameter to decrease the bad threshold. If the parameter is set to 100, the bad threshold is at the right border of the selection zone. For details, see “Threshold calculation detail” on page 541. The fair threshold is not affected.

Use_Default
If set to 0, the auto threshold setting is modified according to the other parameters in this Take Action. If set to 1, the value of the auto threshold settings for this request is taken from the "parent": the values that have been set for the request type, for the entire application, or the ITCAM default values.

Example: YN:Enable_Auto_Threshold 1 12 50 200 150 300 0

Override_Auto_Threshold: override threshold values

Use the Override_Auto_Threshold Take Action to override fair and bad response time threshold values for any request in the application. In this case, while the baselining statistical data is still preserved, ITCAM does not use automatically calculated thresholds.

Do not override threshold values unless you have analyzed the application performance in detail (or were instructed to override threshold values by IBM Level 3 Support). To adjust threshold values without manually overriding them, see “Enable_Auto_Threshold: set threshold parameters” on page 532.

To remove an override, select a request in the “Selected Request - Baseline workspace” on page 445, and select the Enable_Auto_Threshold takes action command. Leave all parameters as they are, in order to use the same auto threshold parameters as were used before the override. If you need to change these parameters, see “Enable_Auto_Threshold: set threshold parameters” on page 532.

Command syntax

YN:Override_Auto_Threshold *App_Id Request_Id Fair_Response_Threshold Bad_Response_Threshold*

Parameters:

App_Id
The application ID, automatically assigned in the portal from the selection context when Take Action was invoked.

Request_Id
The request ID, automatically assigned in the portal from the selection context when Take Action was invoked.

Fair_Response_Threshold
The fair response time threshold, in milliseconds.

Bad_Response_Threshold
The bad response time threshold, in milliseconds.

Recycle_Application_Server: Recycle a J2EE application

Use the Recycle_Application_Server command to stop and then restart an application server. The J2SE application server does not support this take action command.

Command syntax

If invoked from the J2EE Agent entry on the Navigator, the syntax is:

YJ:CycleAppSrv *server_name user password*

Where *server_name* is the J2EE server name, and the *user* and *password* are your own J2EE Application Server identifiers set by the J2EE administrative console (required only if J2EE global security is enabled.)

If, however, this command is invoked from a subnode of the J2EE Agent entry on the Navigator, the syntax is:

YJ: CycleAppSvr *user password*

Where *user* and *password* are your own J2EE Application Server identifiers set by the J2EE administrative console; these are required only if J2EE global security is enabled. (In this case, *server_name* is not required because the subnode name-that is, the server name is already known.)

Remove_J2EE_Application: Remove a J2EE Application

You can use the Remove_J2EE_Application command to remove an application that is in an undeployed state.

Command syntax

If invoked from the WebSphere Agent entry on the Navigator, the syntax is:

YN:Remove Application *&App_Id*

where *&App_Id* is the application ID.

If this command is invoked from a subnode of the J2EE Agent entry on the Navigator, the syntax is:

YN:Remove Application App_Id

In this case you must enter the value for the App_Id where *App_Id* is the application ID.

Remove_J2EE_SubNode: Remove an inactive J2EE application server

Use the Remove_SubNode command to remove a J2EE application server that is no longer active from the Navigator tree.

Command syntax

If invoked from the J2EE Agent entry on the Navigator, the syntax is:

YJ:RemSubNode *server_name*

where *server_name* is the J2EE server (the subnode name).

If, however, this command is invoked from a subnode of the J2EE Agent entry on the Navigator, the syntax is:

YJ:RemSubNode

In this case, the *server_name* value is not required because the subnode name (server name) is already known.

Set_Application_Monitoring: Set monitoring

Use the Set_Application_Monitoring command to set monitoring of the J2EE application. The J2SE application server does not support this take action command.

Command syntax

YJ:Set_Application_Monitoring *App_Id Monitoring_Enabled Request_Data_Monitoring_Level Request_Data_Sampling_Rate*

where *App_Id* is the application ID which is automatically assigned in the portal from the selection context when Take Action was invoked.

Monitoring_Enabled is a Boolean value and the valid values are 0 and 1. It defines whether monitoring agent application dashboard monitoring feature is enabled for the given application.

Request_Data_Monitoring_Level is an integer value that defines custom request monitoring level for the given application. Valid values are 0 (DISABLE), 1 (LEVEL1), and 2 (LEVEL2). This level overrides any level that the user might set for the entire monitoring agent.

Request_Data_Sampling_Rate is an integer value that defines custom request monitoring rate (in percentage) for the given application. Valid values range from 0 to 100.

Set_Completion_Thresholds: Set completion thresholds

Use the Set_Completion_Thresholds command to define the thresholds of the error rate for the J2EE application. The J2SE application server does not support this take action command.

Command syntax

YJ:Set_Completion_Thresholds *App_Id Fair_Completion_Rate Bad_Completion_Rate*

where *App_Id* is the application ID which is automatically assigned in the portal from the selection context when Take Action was invoked.

Fair_Completion_Rate and *Bad_Completion_Rate* are the values in percentage that define thresholds for fair and bad requests completion rates.

Set_Request_Sampling_Rate: Set the sampling rate for request data

Use the Set_Request_Sampling_Rate command to define the percentage of requests to monitor.

Command syntax

YJ:SetRequestSamplingRate *percent*

where *percent* is the percentage of requests you want sampled. Specify a value in the range 1 - 100.

Start_Application_Server: Start a J2EE application server

Use the Start_Application_Server command to start a J2EE application server. The J2SE application server does not support this take action command.

Command syntax

If invoked from the J2EE Agent entry on the Navigator, the syntax is:

YJ:StartAppSrv *server_name user password*

where *server_name* is the J2EE server name, and *user* and *password* are your own J2EE Application Server identifiers set by the J2EE administrative console (required only if J2EE global security is enabled).

If, however, this command is invoked from a subnode of the J2EE Agent entry on the Navigator, the syntax is:

YJ:StartAppSrv *user password*

where *user* and *password* are your own J2EE Application Server identifiers set by the J2EE administrative console; these are required only if J2EE global security is enabled. (In this case, *server_name* is not required because the subnode name-that is the server name-is already known.

Start_Baselining: Start the baselining process

ITCAM can run a *baselining process* for every application. During this process, which runs for a preset period, the data collector collects statistical data on metric

values for a given period. Based on this statistical data, the monitoring agent can automatically set the fair and bad thresholds, as well as the typical breakdown of response times for nested requests. Use the Start Baselining Take Action command to start the baselining process.

When ITCAM begins monitoring an application for the first time, it automatically starts this process for the application. However, with time, average response times can change because of configuration, load pattern, database size, and other issues. You can manually start the baselining process again to take these changes into account. You can also use IBM Tivoli Monitoring (ITM) policies and workflow management to run the baselining process every few months.

As soon as you take the Start Baselining action, the baselining process begins. The thresholds are updated when either the Period or the Update Interval passes.

While the baselining process is running, you can trigger a baseline update to immediately set the thresholds based on the information collected so far.

Command syntax

YN:Start_Baselining *App_Id Period Update_Interval Run_Clean*

Where:

App_Id
The application ID, automatically assigned in the portal from the selection context when Take Action was invoked.

Period
The time for which the baselining process runs. The data collector collects the necessary statistical information for this entire period. When ITCAM starts the baselining process automatically, it sets the period to seven days. The format is `ddd/hh:mm:ss`.

Update_Interval
If you set this parameter to a time interval, ITCAM updates the thresholds according to the information already collected every time this interval passes. For example, when ITCAM starts the baselining process automatically, it sets the update interval to 1 hour. During the seven days that the initial baselining runs, every hour the thresholds are updated according to the statistical data collected so far (for all request types where at least one request was received during the baselining process). The format is `ddd/hh:mm:ss`.

Run_Clean
Set to either 0 or 1. If set to 0, statistical data collected in any previous baselining for the same requests are kept and "amalgamated" with the new data; if set to 1, only the new data is used for setting the thresholds. Normally, you set this to 1.

Note: when this Take Action command is selected for a node representing a z/OS servant region, applies to all servant regions in the same managed system (IBM WebSphere Application Server instance).

Start_GC_Monitoring: Begin reporting garbage-collection data

Use the Start_GC_Monitoring command to activate the display of garbage-collection statistics. This setting is on top of the J2EE Application Server Verbose Garbage Collection value, which must also be active for garbage-collection data to be reported.

Command syntax

YJ:StartGCMonitor

Start_Request_Monitoring : Begin reporting request data

Use the Start_Request_Monitoring command to activate the display of request data.

Command syntax

YJ:StartRequestMonitor *level*

where *level* is the resource-data collection level, either Level1 or Level2. When the collection level is set to Level1, only edge request data-such as servlets and JSPs-are collected; when set to Level2, nested request data (such as JDBC and JMS requests) are also collected.

Important: You can set the monitoring level for any operation separately, using the "Set_Application_Monitoring: Set monitoring" on page 536 Take Action command. The monitoring level from the Start_Request_Monitoring Take Action command is applied by default to newly discovered applications.

Start_Resource_Monitoring: Begin reporting PMI data

Use the Start_Resource_Monitoring command to activate the display of resource (that is, PMI) data. This setting is on top of the J2EE Application Server PMI instrumentation levels, which must also be set for resource data to be reported.

Command syntax

YJ:StartResourceMonitor

Stop_Application_Server: Stop a J2EE application server

Use the Stop_Application_Sever command to stop an application server. The J2SE application server does not support this take action command.

Command syntax

If invoked from the J2EE Agent entry on the Navigator, the syntax is:

YJ:StopAppSvr *server_name user password*

where *server_name* is the J2EE server name, and *user* and *password* are your own J2EE Application Server identifiers set by the J2EE administrative console (required only if J2EE global security is enabled).

If, however, this command is invoked from a subnode of the J2EE Agent entry on the Navigator, the syntax is:

YJ:StopAppSvr *user password*

where *user* and *password* are your own J2EE Application Server identifiers set by the J2EE administrative console; these are required only if J2EE global security is enabled. (In this case, *server_name* is not required because the subnode name-that is, the server name-is already known.)

Stop_Baselining: stop the baselining process

Use the Stop_Baselining Take Action command to immediately stop the baselining process for an application, and recalculate the thresholds based on the request data available up to this point.

Normally you do not have to perform this action. To recalculate the thresholds based on the request data available up to this point, without stopping the baselining process, see "Update_Baseline: trigger a baseline update."

Command syntax

YN:Stop_Baselining *App_Id*

Where:

App_Id
The application ID, automatically assigned in the portal from the selection context when Take Action was invoked.

Note: when this Take Action is selected for a node representing a z/OS servant region, it applies to all servant regions in the same managed system (IBM WebSphere Application Server instance).

Stop_GC_Monitoring: Stop reporting garbage-collection data

Use the Stop_GC_Monitoring command to end the display of garbage-collection statistics.

Command syntax

YJ:StopGCMonitor

Stop_Request_Monitoring: Stop reporting request data

Use the Stop_Request_Monitoring command to end the display of request data.

Command syntax

YJ:StopRequestMonitor

Stop_Resource_Monitoring: Stop reporting PMI data

Use the Stop_Resource_Monitoring command to end the display of resource (that is, PMI) data.

Command syntax

YJ:StopResourceMonitor

Update_Baseline: trigger a baseline update

If the baselining process is running, the thresholds are set automatically when either the Period or the Update Interval passes. For the initial baselining process,

the first automatic update happens after one hour. With the Update_Baseline Take Action command, you can force ITCAM to update the thresholds immediately, based on the information collected so far. This can be useful if you do not want to wait for the periodic automatic update. Once the automatic update time comes, the threshold is updated again.

If a baselining process is not running for the application, an error is raised. If no requests of a given request type have been received since the baselining process has started, the update does not affect this request type.

Command syntax

YN:Update_Baseline *App_Id*

Where:

App_Id
The application ID, automatically assigned in the portal from the selection context when Take Action was invoked.

Note: When this Take Action is selected for a node representing a z/OS servant region, it applies to all servant regions in the same managed system (IBM WebSphere Application Server instance).

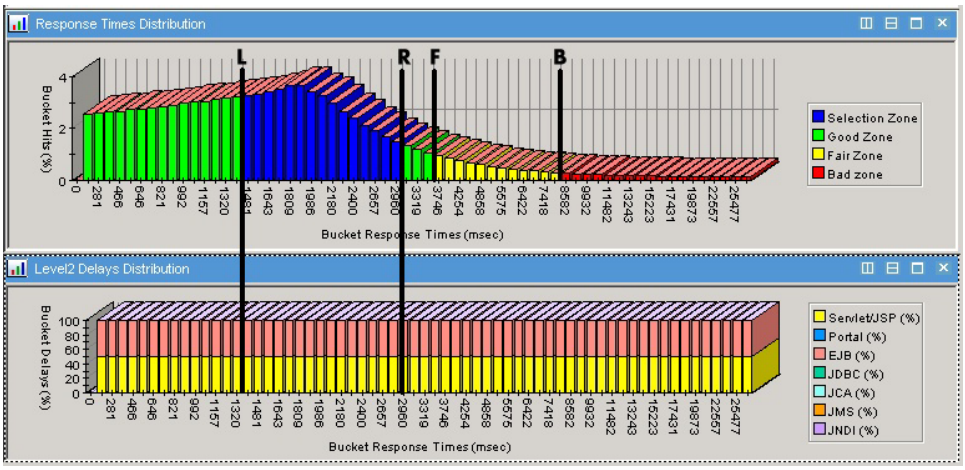
Threshold calculation detail

If you want to set parameters that affect the calculation of the automatic response time thresholds, you might need to know the details of this calculation.

ITCAM processes the baselining statistical data and applies the auto threshold parameters in the following way. The parameters are set in the Enable_Auto_Threshold take action command, see "Enable_Auto_Threshold: set threshold parameters" on page 532.

1. The response time results are sorted into up to 64 "buckets", from zero to the maximum response time encountered for this request. The buckets do not represent equal time intervals; for response time regions where most of the "hits" fall, the buckets represent smaller intervals. For example, if the maximum encountered time is 1000 ms but most response times are 300 - 500 ms, then the first bucket might be 0 - 50 ms, but there can also be buckets representing response times of 305 - 310 ms and 400 - 402 ms. ITCAM distributes the bucket borders so that the largest number of hits in any one bucket are not more than three times the number of hits in the smallest bucket.

   ITCAM calculates the percentage of the total amount of requests that fall into each response time bucket, and divides it by the time interval width represented by the bucket. This is shown on the **Response Times Distribution** bar chart in the "Selected Request - Baseline workspace" on page 445.



Each bar represents a bucket. The bar height shows the percentage of the requests in this bucket. All the subsequent calculations are rounded up to buckets.

2. ITCAM determines the selection zone, which contains the "typical" response time values. This zone is represented by the blue bars on the chart.

   ITCAM finds the response time interval (left border L to right border R) where the following factors are true:

   - The percentage of hits that fall into this interval is no less than the Auto_Threshold_Percent parameter.
   - The spread of the time interval, calculated as (R/L)*100 - 100, is not greater than the Auto_Threshold_Deviation parameter.

     Important: The Auto_Threshold_Deviation parameter does not denote the statistical definition of deviation.

   If several zones match these criteria, ITCAM chooses the one where the following value is the greatest: S/(R-L), where S is the total number of hits that fell into this zone.

   If a zone where both requirements are true cannot be found at all, ITCAM first determines the interval where the percentage of hits is not less than the Auto_Threshold_Percent parameter while the spread is as little as possible. Then, within this interval, it finds a zone where the spread is not greater than the Auto_Threshold_Deviation parameter and the percentage of hits is as large as possible.

   ITCAM determines the typical nested request times from the nested request times in this zone, shown on the **Level2 Delays Distribution** chart.

3. Finally, ITCAM calculates the thresholds.

   The fair threshold is determined using the left and right borders of the selection zone and the Auto_Threshold_Fair_Projection parameter:

   F = L + ((R-L) * Auto_Threshold_Fair_Projection / 100)

   The bad threshold is calculated in the same way, using the Auto_Threshold_Bad_Projection parameter:

   B = L + ((R-L) * Auto_Threshold_Bad_Projection / 100)

   Example: the left border of the selection zone can be L=1450 ms, and the right border R=3000 ms. By default, Auto_Threshold_Fair_Projection=150, and Auto_Threshold_Bad_Projection=300. In this case:

   - The fair response threshold is F = 1450 + ((3000-1450) * 150 / 100) = 3775 ms

- The bad response threshold is B = 1450 + ((3000-1450) * 300 / 100) = 6100 ms

Glossary for ITCAM Agent for J2EE

A

administrative console A graphical interface that guides the user through systems administration tasks such as deployment, configuration, monitoring, starting, and stopping applications, services, and resources.

C

connection pool A group of host connections that are maintained in an initialized state, ready to be used without having to create and initialize them.

CPU Central Processing Unit. The part of the computer that controls the interpretation and execution of instructions.

CTG CICS Transaction Gateway. CTG integrates the J2EE Application Server applications of your site with key mature business systems running on CICS servers. CTG integrates middle-tier application servers with CICS by providing a multiuser gateway that supports Web applications written in Java, C/C++, Visual Basic, and COBOL. CTG supports three programming interfaces: the External Call Interface (ECI), the External Presentation Interface (EPI), and the External Security Interface (ESI). The latest version of CTG implements the J2EE Connector Architecture (JCA), which allows enterprise Java technology to exploit CICS applications.

D

data sources Data pertaining to JDBC data streams. These are logical connections to database subsystems.

DCE Distributed Computing Environment. A specification from the Open Software Foundation (OSF) that supports remote function execution across a network. J2EE Application Server uses DCE to provide certain types of security, for example, authentication of tokens, tickets, or credentials in an untrusted network.

design patterns Written narratives that define a recurring problem, outline a solution, and describe the tradeoffs involved in implementing that solution. In object-oriented programming environments like Java, a design pattern also describes certain objects and object classes to be used when designing such a solution.

DHCP Dynamic Host Configuration Protocol. A communications protocol that lets network administrators centrally manage the assignment of Internet Protocol (IP) addresses across an organization network. Without DHCP, each computer IP address must be entered manually at each computer; if computers move to another location in another part of the network, a new IP address must be chosen. DHCP lets a network administrator supervise and distribute IP addresses from a central point and automatically sends a new IP address when a computer is plugged into a different location in the network.

dynamic cache A consolidation of several caching activities, including servlets, Web services, and J2EE commands into one service where these activities work together to improve performance and share configuration parameters.

E

EJB Enterprise Java Bean. A component architecture for the development and deployment of object-oriented, distributed, enterprise-level applications. Applications written using the Enterprise JavaBeans architecture are scalable, transactional, multi-user, and secure.

EJB module A software unit that consists of one or more enterprise beans and an EJB deployment descriptor.

G

garbage collection A facility of the JVM that reallocates and frees up memory lost when objects are created and later destroyed. Garbage collection usually occurs when insufficient heap space is available for allocating new objects, although you can trigger it manually by invoking the System.gc method.

Garbage collection can be expensive since it involves identifying all the unreferenced objects, removing them from the heap, and then possibly compacting the heap.

H

heap A memory storage area known formally as the System Resources area that stores system information about running applications. The main storage area used for allocating Java classes and object instances, as well as executable code. The allocation of objects on the heap creates a live or active object. The object exists as long as the JVM maintains a pointer to it; when all references to an object cease to exist, it is subject to garbage collection.

hover help A form of online help that can be viewed by moving a cursor over a GUI item such as an icon or field.

HTTP Hypertext Transfer Protocol. A suite of protocols for the Internet that transfer and display hypertext documents.

HTTP sessions Data related to sessions of specific World Wide Web browsers.

I

IIOP Internet Inter-ORB Protocol. A protocol that distributed programs written in different programming languages can use to communicate over the Internet. IIOP is a part of the Common Object Request Broker Architecture (CORBA). IIOP is based on the client/server computing model, in which a client program makes requests of a server program that waits to respond to client requests. With IIOP, you can write client programs that communicate with the existing server programs of your site wherever they are located. You can do this without having to understand anything about the server other than the service it performs and its address (called the Interoperable Object Reference, IOR, which comprises the server port number and IP address).

instrumentation The process of modifying program code so that the time it takes the code to run, along with other statistics, can be measured. These modifications insert hooks into these Java methods so that the real time and CPU time spent executing the methods can be measured. Instrumentation is key to certain

data-collection features (such as lock analysis) of IBM Tivoli Composite Application Manager for Application Diagnostics Agent for J2EE.

IBM Tivoli Monitoring platform The software architecture and foundation that support the development and operations of Tivoli Enterprise Portal and its Tivoli Enterprise Monitoring Agents.

J

J2EE Java 2 Platform, Enterprise Edition. An environment for developing and deploying enterprise applications using the Java language. The J2EE platform consists of a set of services, application programming interfaces (APIs), and protocols that provide the functions needed for developing multi-tiered, Web-based applications.

JAR file A Java archive file, which is a compressed file containing many class files along with their directory structure.

JavaBean The Java implementation of component-based software architecture, which defines how small, tested software entities called components can be integrated to build complete software solutions (called containers).

JCA J2EE Connector Architecture. A template for writing your own connectors. The template is a binding between a J2EE application server and a backend enterprise information system (EIS) or data repository such as CICS, IMS, or DB2.

JDBC Java Database Connectivity. An application programming interface (API) for connecting Java programs to the data in a relational database. With this API, you can encode data requests in Structured Query Language (SQL) that JDBC then passes to the database manager for interpretation and processing.

JMS Java Message Service. A programming interface that connects Java programs to middleware messaging applications, for example, J2EE MQ.

JMX Java Management Extensions. A standard technology for management and monitoring of Java applications and Java environments that defines architecture, application programming interfaces (APIs), and services for application and network management. JMX provides tools for building distributed, Web-based solutions for managing and monitoring Java devices and applications.

A JMX agent is an MBean container.

JNDI Java Naming and Directory Interface. A programming interface that connects Java applications to naming and directory servers such as LDAP.

JSP Java server page. A Web page that specifies one or more servlets whose execution on the Web server modifies the page content or appearance before it is presented to the user.

JTA Java Transaction API. An application programming interface developed by Sun Microsystems that specifies standard Java interfaces between a transaction manager (such as Tuxedo) and other players in a distributed transaction system: the resource manager, the application server, the transactional applications, and often the database manager as well.

JVM Java virtual machine. A software implementation of a central processing unit (CPU) that runs Java applets and applications. The JVM provides a software execution engine that safely and compatibly executes the byte codes in Java class files on various microprocessors, whether embedded in a computer or in another electronic device.

JVMPI Java Virtual Machine Profiling Interface. An experimental interface that provides profiling hooks into the Java virtual machine. This interface supports two-way function calls between the JVM and a profiler agent: the virtual machine notifies the agent of various events, and the agent issues requests for control information.

K

Kerberos A security system from the Massachusetts Institute of Technology that provides security services for networking.

L

LDAP Lightweight Directory Access Protocol. A protocol that uses TCP/IP to access directories. Applications can use these directories for storing common data and for retrieving data. For example, applications can use LDAP to access such information as email address, service configuration parameters, or public keys.

lock A semaphore created through the use of the Java synchronized keyword that prevents simultaneous access to a Java object or section of code.

M

MBeans Managed Beans. A set of standard instrumentation methods for use in Java programs and by Java management applications (such as IBM Tivoli Composite Application Manager for Application Diagnostics Agent for J2EE) that allows monitoring and management of Java-based applications. An MBean is a JavaBean that represents a JMX-manageable resource.

monitor 1) A transaction environment for maintaining large quantities of data in a consistent state and that controls which users and clients can access data through authorized servers. 2) A programming primitive created so multiple program threads can share the same resource (such as an object). A program creates a monitor for a given resource by requesting it from the system; the system returns a unique ID for that monitor. After that, any thread needing the resource must use the monitor to lock the resource while the thread is using it. If the monitor is already locked, a thread requesting the resource is queued by the system and then given control when the monitor becomes unlocked. Also called a mutex.

MVC The Model/View/Controller design pattern is based on the separation of the application into three objects: the user interface ("view"), the logical structure of the data the application requires ("model"), and the user commands that change the view or the model ("controller"). Design patterns themselves are written narratives that define a recurring problem, outline a solution, and describe the tradeoffs involved in implementing that solution (in object-oriented programming environments like Java, a design pattern also describes certain objects and object classes to be used when creating such a solution).

N

node Any managed system, such as a J2EE application server, that the Tivoli Enterprise Portal is monitoring. A node can also be a managed system of subnodes being managed under a primary node.

O

OLT Object Level Trace. A tool for testing distributed applications that include a graphical trace facility and a remote debugger.

ORB Object Request Broker. In object-oriented programming, software that serves as an intermediary by transparently enabling objects to exchange requests and responses.

P

PMI Performance Monitoring Infrastructure. The application programming interface (API) that IBM provides for extracting J2EE Application Server performance data. PMI must be enabled and the appropriate instrumentation levels set for the Tivoli Enterprise Monitoring Agent to extract PMI data and populate certain workspaces. PMI runs as an interface to JMX.

portal A Web-based application that commonly provides personalization, single signon, and content aggregation from different sources, and hosts the presentation layer of Information Systems (IS). Portals are becoming the next-generation desktop, delivering e-business applications over the Web to many types of client devices.

portlet A Java technology-based Web component, managed by a portlet container, that process requests and generates dynamic content. Portlets are used by portals as pluggable user interface components that provide a presentation layer to various heterogeneous Enterprise Information Systems (EIS) or Information Systems (IS).

R

request The entry point into an application whose processing or response time directly affects the response time the end user perceives. In IBM Tivoli Composite Application Manager for Application Diagnostics Agent for J2EE, a request is a servlet, JSP, or EJB method. Also called a transaction.

request analysis A configuration technique for a request (that is, a transaction) within J2EE Application Server that allows you to see how often the request runs and what factors about the request degrade its performance. Request analysis involves collecting and aggregating request data on each request that runs. Its primary purpose is to report on requests running in the application server, how often they run, their response time, and what is causing performance degradation.

Request analysis works by dynamic object code instrumentation, which modifies the Java object code for the application' s classes as they are being loaded into the JVM.

resource adapter An implementation of the J2EE Connector Architecture Specification that provides applications with access to resources outside of the server or provides server applications with access to an Enterprise Information System (EIS). A resource adapter can provide applications access to resources such

as DB2, CICS, SAP, and PeopleSoft. It can provide an EIS with the ability to communicate with message-driven beans configured on the server. A resource adapter is implemented in a resource adapter archive file, which has an extension of .rar. A resource adapter can be provided as a stand-alone adapter or as part of an application, in which case it is referred to as an embedded adapter.

RMI Remote Method Invocation. A Java standard from Sun Microsystems that performs a remote procedure call (RPC) to allow Java objects stored in the network to be accessed remotely in a client/server environment.

RPC Remote Procedure Call. A protocol based on the Distributed Computing Environment (DCE) of the Open Software Foundation. DCE allows one program to request services from a program running on another computer in a network. (A procedure call is also known as a function call or a subroutine call.) RPC uses the client/server model: the requesting program is the client, and the responding program is the server. As with a local procedure call, an RPC is a synchronous operation: the requesting program is suspended until the remote procedure returns its results.

S

servlet A Java application that runs in an application server or Web server, and that provides server-side processing.

session A series of requests to a servlet that originate from the same user at the same browser. Sessions allow applications running in a Web container to track individual users.

signature The name of an operation or method and its parameters.

SSL Secure Sockets Layer. A security protocol for communication privacy to provide secure client-server conversations.

struts A widely used framework for developing servlet- or JSP-based Web applications that is distributed as open source by the Apache Jakarta Project. Struts encourages application architectures based on the Model two approach, a variation of the Model-View-Controller (MVC) design paradigm.

T

thread A dispatchable unit of work.

thread pool The threads that are being used by or are available to a computer program.

transaction A single execution of a workload.

U

URI Uniform Resource Identifier. An identifier for a point of content on the Internet, be it a page of text, a video or sound clip, a still or animated image, or a program. The most common form of URI is the Web page address, which is a particular form of URI called a Universal Resource Locator (URL). A URI typically describes the mechanism used to access the resource, the computer that houses the resource, and the name of the resource (such as a file name) on that computer.

URL Universal Resource Locator. The unique address for a file accessible via the Internet. Such a file might be a Web page (usually the home page), an image file, or a program such as a Java applet or servlet. The URL comprises the protocol used to access the file, a domain name that identifies a specific computer on the Internet, and a path name that specifies that file location on that computer.

W

Web applications The runtime environment for dynamic Web applications. A J2EE Web application server implements the services of the J2EE standard. It provides communications, resource management, security, transaction management, and persistence capabilities for Web applications. It also typically includes an administration interface for managing the server and deployed applications.

Web container A special J2EE container that manages Web applications in a J2EE architecture. A Web container specifies a runtime environment for Web components, including security, concurrency, life cycle management, transaction, deployment, and other services; it also enables a Web application to access external resources such as relational databases (via JDBC) and Enterprise Java Beans. A Web container provides the same services as a JSP container and provides support for managing Java Server Pages.

Every J2EE server contains at least one Web container.

Chapter 5. ITCAM Agent for HTTP Servers

IBM Tivoli Composite Application Manager Agent for HTTP Servers provides a Systems Management solution for the web servers for distributed platforms. Using ITCAM Agent for HTTP Servers, you can monitor multiple web servers running on the same physical node.

The Tivoli Enterprise Monitoring Agent collects performance data using the following methods:

- Apache servers parse the config file to get the server name and collect data by the module. The module handles all the HTTP requests.
- Sun web servers collect data by polling SNMP service for web server statistics and parsing web server configuration files to get information not provided by the SNMP subagent.

Attributes within ITCAM Agent for HTTP Servers collect data about the inner workings of a web server and performance information about user applications running under its control.

For additional usage information about this agent, see:

- Workspaces
- Attributes
- Situations
- Take Action commands

Workspaces for ITCAM Agent for HTTP Servers

As part of the integration of IBM Tivoli Composite Application Manager Agent for HTTP Servers with the Tivoli Enterprise Portal, the workspaces show views of monitoring data that provide detailed current data about the web servers running on the UNIX and Windows platforms of your site. In addition to reports and graphs, a workspace can contain other views (that is, windows), such as a Request Rate - History view, or a Take Action view from which you can issue commands.

Several views of high-level information

Several workspaces provide high-level information to help you meet the monitoring and administrative needs of your site. These workspaces report on status and availability for both the web server administrative server and its web server instances. You can use the workspaces to easily monitor the availability of your enterprise, the web servers, and web server instances.

Available Tivoli Enterprise Portal workspaces

For an overview of the organization of the available workspaces, see Organization of the predefined workspaces.

Organization of the predefined workspaces

The IBM Tivoli Composite Application Manager Agent for HTTP Servers workspaces for the Tivoli Enterprise Portal define data displays that display in the Navigator Physical view.

Workspace organization

The hierarchy levels shown in the Navigator depend upon the enterprise customization of the Tivoli Enterprise Portal. However, ITCAM Agent for HTTP Servers does provide a set of predefined workspaces, which do not require customization. The following list shows the order and hierarchy of the predefined workspaces provided by the ITCAM Agent for HTTP Servers Tivoli Enterprise Monitoring Agent. It is a representation of how the predefined workspaces are organized in the Navigator. For more detailed information about a workspace, click its name in this list.

operating system [for example, Windows]
- *system* [that is, nodename]
  - "web server Agent workspace" on page 555
    - "Apache web server workspace"
      - "Apache websites workspace" on page 553
    - "Sun Java System web server workspace" on page 554
      - "Sun websites workspace" on page 554

For additional information, see: Attribute groups used by the predefined workspaces

Apache web server workspace

This workspace shows the Apache web server information, including the summary rates over all websites (virtual hosts).

This workspace displays data provided by the "Apache web server attributes" on page 557.

The predefined workspace contains the following items:
- Request Rate - History graph, which shows the historical rate at which HTTP requests were made per second
- Server Failure Rate - History graph, which shows the historical rate at which server internal errors occurred per minute
- Transfer Rate - History graph, which shows the number of kilobytes received and sent by the web server per second
- Failed Request Rate - History graph, which shows the historical number of failed requests per minute
- Server Summary report, which displays summarized information about the Apache web server, including server status, request rate, kilobytes rate, and login rate

Accessing the Apache web server workspace

To access this workspace, complete the following steps:
1. Within the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the node list of monitored applications, expand the list of web server agents.
4. Within the list of available agents, click the **Apache Web Server** entry of your choice.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Apache websites workspace

This workspace shows the list of the websites (virtual hosts) that are configured for the Apache web server along with their status. Clicking the link in the Selected Web Site view shows data for the selected website in the same workspace. By default the website listed in first row in the websites table is presented in the Apache websites workspace.

There are five views in the Apache websites workspace:

- Selected Web Site
- Request Rate - History
- Transfer Rate - History
- Pages Failed Rate - History
- Failed Logins Rate - History

The Selected Web Site view displays all the web sites by default. Where as the four other views can only display the data for the first web site listed in the Selected Web Site view. This is a product limiataion.

This workspace displays data provided by the "Apache websites attributes" on page 558.

The predefined workspace contains the following items:

- Request Rate - History graph, which shows the historical rate at which HTTP requests were made, per second, for the selected Apache website
- Transfer Rate - History graph, which shows the number of kilobytes, per second, received, and sent by the selected web service
- Pages Failed Rate - History graph, which shows the number of requests per minute that were not satisfied by the server because the requested document was not found or is forbidden. This rate applies to the collection interval for a selected Apache website
- Failed Login Rate - History graph, which shows the historical number of failed logins per minute for the selected Apache website
- Websites report, which displays the status of each Apache website
- Selected website report, which displays aggregated information about all Apache websites

Accessing the Apache websites workspace

To access this workspace, perform the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the node list of monitored applications, expand the list of web server agents.
4. Within the list of available agents, expand the web server of your choice.

5. Within the list of available web server workspaces on that server, click the **Apache Web Sites** entry. By default the website listed in first row in the websites table is presented in the Apache websites workspace.

Note:

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Sun Java System web server workspace

This workspace shows the Sun Java System web server information, including the summary rates over all websites (virtual servers).

This workspace displays data provided by the "Sun web server attributes" on page 560.

The predefined workspace contains the following items:

- Requests per second - History graph, which shows the rate, per second, at which requests have been processed by the virtual server
- Kilobytes per second - History graph, which shows the aggregated number of kilobytes received and sent per second
- Server Error per minute graph, which shows the rate at which the number of 500-level (Server Error) responses issued (per minute) by the web server during the collection interval
- Connection Queue Count - Which shows the number of connections currently in the web server connection queue
- Server Summary report, which displays the summarized information about the Sun Java System web server

Accessing the Sun Java System web server workspace

To access this workspace, perform the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications on that node, expand the list of web server agents.
4. Within the list of available agents, click the **Sun Java System Web Server** entry of your choice.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Sun websites workspace

This workspace shows the list of the Sun websites (virtual servers) configured for the server along with their status. Clicking the link in the website table shows data for the selected website in the same workspace.

This workspace displays data provided by the "Sun websites attributes" on page 563.

The predefined workspace contains the following items:

- Request per second - History graph, which shows the rate, per second, at which requests have been processed by the server
- Pages not Found per minute - History graph, which shows the number, per minute, of 404-level responses (Pages Not Found) issued by the virtual server during the collection interval
- Kilobytes per second - History graph, which shows the aggregated number of kilobytes received and sent per second
- Failed Logins per minute - History graph, which shows the historical number of 401-level responses (Failed Login) issued, per minute, by the virtual server during the collection interval
- Websites report, which displays the status of each Sun website
- Selected website report, which displays aggregated information about all the Sun websites

Accessing the Sun websites workspace

To access this workspace, perform the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications on that node, expand the list of web server agents.
4. Within the list of available agents, expand the web server of your choice.
5. Within the list of available web server workspaces on that server, click the **Sun websites** entry.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

web server Agent workspace

This workspace shows the status on all monitored web servers and the web server agent events.

This workspace displays data provided by both the "HTTP Servers Agent Events attributes" on page 566 and the "Web Servers Status attributes" on page 567.

The predefined workspace contains the following items:

- Web Servers Summary report, which displays the overall status of web servers, including server type, server name, server status, uptime, and process ID
- Agent Events report, which displays information about web server agent events, including severity, message ID, and message description

Accessing the web server Agent workspace

To access this workspace, perform the following steps:

1. Within the Navigator, expand Windows Systems, Linux Systems, or UNIX Systems, as appropriate for the node you are monitoring.
2. Within the node list, expand the entry that corresponds to your node name.
3. Within the list of monitored applications on that node, click **Web Server Agent**.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Attributes for ITCAM Agent for HTTP Servers

IBM Tivoli Composite Application Manager Agent for HTTP Servers is a Tivoli Enterprise Management Agent that is located within your distributed systems. This agent gathers data about web server processes that are running, and stores this data in elements called attributes. Each attribute is a characteristic of an object. For example, the Kilobytes Rate (per second) attribute in the Apache web server attribute group reports the rate at which kilobytes were sent and received, per second, during the collection interval.

Attribute groups

The ITCAM Agent for HTTP Servers attributes are organized into groups of related items. These attribute groups comprise the attribute tables for this agent.

Attributes and workspaces

Within the Tivoli Enterprise Portal workspaces, these attributes are displayed in, and correspond to, the columns in the reports and the items in the graphic displays for charts and graphs. You can use the collected data to analyze and monitor the performance of your web servers and the applications running within them. For an overview of the correlations between the predefined workspaces and the attribute groups, see Attribute groups used by the predefined workspaces.

Attributes and situations

Various attributes are referenced by the predefined situations of the product. You can also use the ITCAM Agent for HTTP Servers attributes to create your own situations to monitor the performance of your web servers and their applications. These situations can monitor your web server resources or correlate multiple conditions to alert you to problems that might occur when attribute values exceed thresholds defined by you.

Attribute groups used by the predefined workspaces

A workspace contains graphical data or report columns that correspond directly to particular attributes in an attribute group. The table shows the correlations between the predefined workspaces and the attribute groups. The workspaces are listed alphabetically, not in the order in which they are displayed in the Navigator.

Table 127. Workspaces and the attribute groups they reference

Workspace	Related Attribute Groups
"Apache web server workspace" on page 552	"Apache web server attributes" on page 557
"Apache websites workspace" on page 553	"Apache websites attributes" on page 558
"Sun Java System web server workspace" on page 554	"Sun web server attributes" on page 560
"Sun websites workspace" on page 554	"Sun websites attributes" on page 563
"web server Agent workspace" on page 555	"Web Servers Status attributes" on page 567 "HTTP Servers Agent Events attributes" on page 566

Apache web server attributes

The **Apache Web Server** attributes provide status information about the Apache web server.

The attributes within this group are used to build the "Apache web server workspace" on page 552.

Configuration File The fully qualified path of the Apache HTTP Server configuration file name. The valid format is an alphanumeric string, with a maximum of 256 characters.

Failed Login Rate (per min) The average number of failed logins that occurred, per minute. The valid format is a decimal (formatted to three decimal places).

Failed Requests Rate (per min) The average number (per minute) of failed requests. The valid format is a decimal (formatted to three decimal places).

Interval (sec) The length of the interval in seconds. The valid format is a positive integer.

Kilobytes Rate (per sec) The number of kilobytes that are sent and received per second. The valid format is a decimal (formatted to three decimal places).

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum 256 of characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The identifier of the Apache Server process. The valid format is a positive integer.

Request Rate (per sec) The rate at which HTTP requests were made. The valid format is a decimal (formatted to three decimal places).

Sample Date and Time The date and time the Tivoli Enterprise Management Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 128. Format of the 12–character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Failures Rate (per min) The average number of internal server errors. The valid format is a decimal (formatted to three decimal places).

Start Date and Time The date and time when the web server started. The valid format is a timestamp. This attribute was designed for logging and reporting data collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Status The status of the Apache HTTP server. Valid values are Not_Running, Running, and Error.

Successful Login Rate (per min) The average number of successful logins that occurred per minute. The valid format is a decimal (formatted to three decimal places).

Version The version of the Apache web server. The valid format is an alphanumeric string, with a maximum of 64 characters.

Web Server Name The name of the web server. The valid format is an alphanumeric string, with a maximum of 256 characters.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Apache websites attributes

The **Apache Web Sites** attributes provide status and performance information about the Apache websites workspace.

The attributes within this group are used to build the "Apache websites workspace" on page 553.

Failed Login Rate (per min) The average number of failed logins that occurred per minute. The valid format is a decimal (formatted to three decimal places).

Failed Pages Rate (per min) The rate (per minute) of pages not found or forbidden. The valid format is a decimal (formatted to three decimal places).

Failed Request Rate (per min) The average number, per minute, of failed requests made to the server. The valid format is a decimal (formatted to three decimal places).

Interval (sec) The length (in seconds) of the sampling interval. The valid format is a positive integer.

Kilobytes Rate (per sec) The rate, per second, at which kilobytes sent and received. The valid format is a decimal (formatted to three decimal places).

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Request Rate (per sec) The rate at which HTTP requests were made. The valid format is a decimal (formatted to three decimal places).

Sample Date and Time The date and time the Tivoli Enterprise Management Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 129. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Failures Rate (per min) The rate (per minute) at which Apache web server failures occurred during the collection interval. The valid format is a decimal (formatted to three decimal places).

Attention: This attribute shows incorrect results for some environments. For more reliable information, use the server failures rate attribute of the "Apache web server attributes" on page 557.

SSL Whether SSL is enabled for the virtual host. Valid values are Disabled and Enabled.

Successful Login Rate (per min) The average number of successful logins that were made per minute. The valid format is a decimal (formatted to three decimal places).

Successful Request Rate (per sec) The average number of requests that were fulfilled, per second, during the collection interval. The valid format is a decimal (formatted to three decimal places).

Web Server Name The name of the web server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Web Site Name The name of the website. The valid format is an alphanumeric string, with a maximum of 256 characters.

Web Site Status The status of the Apache website. Valid values are Not_Running, Running, and Error.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Sun web server attributes

The **Sun Web Server** attributes provide status information about the Sun web server.

The attributes within this group are used to build the "Sun Java System web server workspace" on page 554.

Client Errors Rate (per sec) The number of 400-level (Client Error) responses issued by the web server (per second) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Connection Queue Count The number of connections currently in the web server connection queue. The valid format is a positive integer.

Connection Queue Max The maximum number of connections allowed in the web server connection queue. The valid format is a positive integer.

Connection Queue Overflows The number of connections rejected as a result of connection queue overflow. The valid format is a positive integer.

Connection Queue Peak The largest number of connections that were queued simultaneously. The valid format is a positive integer.

Connection Queue Total The number of connections that were accepted. The valid format is a positive integer.

Failed Login Rate (per min) The number of 401-level (Failed Login) responses issued by the web server (per minute) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Idle Threads Count The number of web server request processing threads currently idle. The valid format is a positive integer.

Interval (sec) The length of the sampling interval in seconds. The valid format is a positive integer.

Keepalive Queue Count The number of connections currently in the web server keepalive queue. The valid format is a positive integer.

Keepalive Queue Max The maximum number of connections allowed in the web server keepalive queue. The valid format is a positive integer.

Kilobytes Rate (per sec) The summary rate at which kilobytes are received and transmitted on the network (per second). The valid format is a decimal (formatted to three decimal places).

Kilobytes Received Rate (per sec) The rate at which kilobytes are received on the network (per second). The valid format is a decimal (formatted to three decimal places).

Kilobytes Sent Rate (per sec) The rate at which Kilobytes are transmitted on the network (per second). The valid format is a decimal (formatted to three decimal places).

Node Name The name of the system on which the server is running. The valid format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Other Responses Rate (per sec) The number of responses at a level other than 2xx, 3xx, 4xx, or 5xx that were issued by the web server (per second) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Pages Not Found Rate (per min) The number of 404 (Pages Not Found) responses issued by the web server (per minute) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Process ID The process identifier of the Java virtual machine. The valid format is an alphanumeric string, with a maximum of 64 characters.

Process Size Fraction System Memory Usage The fraction of system memory that is being used by the web server instance process. The valid format is a positive integer.

Process Size Resident The web server instance process resident size in kilobytes. The valid format is a positive integer.

Process Size Virtual The web server instance process size in kilobytes. The valid format is a positive integer.

Redirected Request Rate (per sec) The number of 300-level (Redirection) responses issued by the web server (per second) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Request Rate (per sec) The number of requests processed, per second. The valid format is a decimal (formatted to three decimal places).

Response Bad Request Rate (per sec) The number of 400® (Bad Request) responses issued by the web server (per second) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Response Forbidden Rate (per min) The number of 403 (Forbidden) responses issued by the web server (per minute) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Response Moved Temporarily Rate (per sec) The number of 302 (Moved Temporarily) responses issued by the web server (per second) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Response Not Modified Rate (per sec) The number of 304 (Not Modified) responses issued by the web server (per second) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Response Successful Rate (per sec) The number of 200 (OK) responses issued by the web server (per second) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Response Unavailable Rate (per min) The number of 503 (Unavailable) responses issued by the web server (per minute) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Sample Date and Time The date and time the Tivoli Enterprise Management Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 130. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Contact The contact information for people responsible for server instance. The valid format is an alphanumeric string, with a maximum of 256 characters.

Server Death Times The number of times that the server instance processes stopped during the collection interval. The valid format is a positive integer.

Server Description The description of the server instance. The valid format is an alphanumeric string, with a maximum of 256 characters.

Server Directory The directory of the server instance. The valid format is an alphanumeric string, with a maximum of 256 characters.

Server Failures Rate (per min) The number of 500-level (Server Error) responses issued by the web server (per minute) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Server Instance The MIB index for the web server instance. The valid format is a positive integer.

Server Location The location of the server instance. The valid format is an alphanumeric string, with a maximum of 256 characters.

Server Organization The organization that is responsible for the server instance. The valid format is an alphanumeric string, with a maximum of 256 characters.

Start Date and Time The date and time when the web server started. The valid format is a timestamp. This attribute was designed for logging and reporting data collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Status The status of the Sun web server. Valid values are Non_Running and Running.

Successful Request Rate (per sec) The number of 200-level (Successful) responses issued by the web server (per second) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Thread Count The number of web server request processing threads. The valid format is a positive integer.

Thread Pool Count The number of threads in the pool. The valid format is a positive integer.

Thread Pool Instance The thread pool MIB index. The valid format is a positive integer.

Thread Pool Max The maximum number of threads allowed in pool. The valid format is a positive integer.

Thread Pool Name The thread pool identifier. The valid format is an alphanumeric string, with a maximum of 256 characters.

Thread Pool Peak The maximum number of threads in the pool. The valid format is a positive integer.

Version The software version of the server instance. The valid format is an alphanumeric string, with a maximum of 256 characters.

Web Server Name The name of the web server. The valid format is an alphanumeric string, with a maximum of 256 characters.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Sun websites attributes

The **Sun Web Sites** attributes provide status information about the Sun websites workspace of the Sun Java System web server.

The attributes within this group are used to build the “Sun websites workspace” on page 554.

Address Port SSL The Sun website IP address, port and whether security is enabled. The valid format is an alphanumeric string, with a maximum of 256 characters.

Client Errors Rate (per sec) The number of 400-level (Client Error) responses issued by the virtual server (per second) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Failed Login Rate (per min) The number of 401 (Failed Login) responses issued by the virtual server (per minute) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Failed Responses Percent The percentage of failed responses of the total request count. The valid format is a positive integer.

Interval (sec) The length of the sampling interval in seconds. The valid format is a positive integer.

Kilobytes Rate (per sec) The summary rate at which kilobytes are received and transmitted on the network per second. The valid format is a decimal (formatted to three decimal places).

Kilobytes Received Rate (per sec) The rate at which kilobytes are received on the network (per second). The valid format is a decimal (formatted to three decimal places).

Kilobytes Sent Rate (per sec) The rate at which kilobytes are transmitted on the network (per second). The valid format is a decimal (formatted to three decimal places).

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Other Responses Rate (per sec) The number of responses at a level other than 2xx, 3xx, 4xx, or 5xx that were issued by the virtual server (per second) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Pages Not Found Rate (per min) The number of 404 (Pages Not Found) responses issued by the virtual server (per minute) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Redirected Request Rate (per sec) The number of 300-level (Redirection) responses issued by the virtual server (per second) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Request Rate (per sec) The number of requests processed per second by the virtual server during the collection interval. The valid format is a decimal (formatted to three decimal places).

Response Bad Request Rate (per sec) The number of 400 (Bad Request) responses issued by the virtual server (per second) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Response Forbidden Rate (per min) The number of 403 (Forbidden) responses issued by the virtual server (per minute) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Response Moved Temporarily Rate (per sec) The number of 302 (Moved Temporarily) responses issued by the virtual server (per second) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Response Not Modified Rate (per sec) The number of 304 (Not Modified) responses issued by the virtual server (per second) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Response Successful Rate (per sec) The number of 200 (OK) responses issued by the virtual server (per second) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Response Unavailable Rate (per min) The number of 503 (Unavailable) responses issued by the virtual server (per minute) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Sample Date and Time The date and time the Tivoli Enterprise Management Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 131. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Failures Rate (per min) The number of 500-level (Server Error) responses issued by the virtual server (per minute) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Server Failures Percent The percentage of server failures of the total request count. The valid format is a positive integer.

Server Instance The web server MIB index for the web server instance. The valid format is a positive integer.

Successful Request Rate (per sec) The number of 200-level (Successful) responses issued by the virtual server (per second) during the collection interval. The valid format is a decimal (formatted to three decimal places).

Successful Requests Percent The percentage of successful requests of the total request count. The valid format is a positive integer.

Unauthorized Requests Percent The percentage of unauthorized requests of the total request count. The valid format is a positive integer.

Web Server Name The name of the web server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Web Site Instance The web server MIB index for the virtual server instance. The valid format is a positive integer.

Web Site Name The name of the website. The valid format is an alphanumeric string, with a maximum of 128 characters.

Web Site Status The status of the SUN website. Valid values are Running, Error, and AddressPortUnavailable.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

HTTP Servers Agent Events attributes

The **HTTP Servers Agent Events** attributes collect information about agent-level events that affect the ability of the IBM Tivoli Composite Application Manager for Web Servers agent to collect data for Web Servers, including Apache web server and Sun Java Web server.

The attributes within this group are used to build the "web server Agent workspace" on page 555.

Event Date and Time The date and time the event occurred. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 132. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Message Description The description of the message. The valid format is an alphanumeric string, with a maximum of 256 characters.

Message ID The unique identifier of the message. The valid format is an alphanumeric string, with a maximum of eight characters.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 128 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Sequence Number The sequence number of the message. The valid format is a positive integer.

Severity The severity of the message. Valid values are Info, Warning, Error, and Severe.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Web Servers Status attributes

The **Web Servers Status** attributes provide status about the monitored web servers.

The attributes within this group are used to build the "web server Agent workspace" on page 555.

Node Name The name of the system on which the server is running. The value format is an alphanumeric string, with a maximum of 256 characters.

Origin Node The name of the server subnode. The valid format is an alphanumeric string, with a maximum of 128 characters.

Process ID The identifier of the web server process. The valid format is an alphanumeric string, with a maximum of 64 characters.

Sample Date and Time The date and time the Tivoli Enterprise Management Agent collected the data. The valid format is a 12-character timestamp. For the STR and SCAN functions, the format is MM/DD/YY HH:MM:SS; the following table shows the values contained in this character string:

Table 133. Format of the 12-character timestamp

Character String	Meaning
MM	Month
DD	Day
YY	Year
HH	Hour
MM	Minute

Table 133. Format of the 12-character timestamp (continued)

Character String	Meaning
SS	Second

Example: 09/13/06 18:32:03 indicates the data was collected on September 13 2006, at 18:32:03.

This attribute was designed for logging and reporting data collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Server Directory The directory of the web server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Server Name The name of the web server. The valid format is an alphanumeric string, with a maximum of 256 characters.

Server Type The type of the web Server. Valid values are Apache and Sun_Web_Server

Start Date and Time The date and time when the web server started. The valid format is a timestamp. This attribute was designed for logging and reporting data collection times rather than for creating situations. To specify a time and date for comparison and testing, use attributes from the Universal Time or Local Time groups.

Status The status of the web server. Valid values are Error, Stopped, Start_Pending, Stop_Pending, Running, Continue_Pending, Pause_Pending, and Paused.

For additional information, see:

- Organization of the predefined workspaces
- Attribute groups used by the predefined workspaces

Situations for ITCAM Agent for HTTP Servers

IBM Tivoli Composite Application Manager Agent for HTTP Servers provides a number of predefined situations that you can use to complete the following tasks:

- Monitor your web servers
- Monitor and manage widely dispersed web server resources through localized automation
- Create your own situations using the predefined situations as examples

These predefined situations have alert status of Critical and Warning. When these situations trigger an alert, you can investigate the event by opening its workspace.

How the situations work

Situations are tests expressed in IF-TRUE statements of system conditions that you want to monitor; the tested value is an ITCAM Agent for HTTP Servers attribute expressed in the form *attribute-group.attribute-name*. Thus, if the specified condition occurs or exists, the situation is true, and an alert is issued.

Avoid using negative values

If you define situations that use a counter or a range of numbers, always provide a threshold or use values in a positive range of numbers. For example, use a greater-than-or-equal-to-zero expression as shown in some of the following predefined situations. This practice prevents a situation from falsely tripping. If the ITCAM Agent for HTTP Servers Tivoli Enterprise Monitoring Agent encounters an undefined attribute value, it interprets this as a negative number and erroneously triggers a situation that specified a negative number.

Predefined situations, descriptions, and formulas

Apache_HTTP_Stopped Monitors the status of the Apache web server and issues a Critical condition when the Apache HTTP server is not active. Its formula is as follows:

If

Apache_Web_Server.Server_Status does NOT equal 1

then

the situation Apache_HTTP_Stopped is true.

Apache_Site_Down Monitors the status of the Apache website and issues a Critical condition when one of the virtual hosts run by the Apache HTTP Server is unavailable. Its formula is as follows:

If

Apache_Web_Sites.Web_Site_Status does NOT equal 1

then

the situation Apache_Site_Down is true.

Apache_Site_failed Monitors the server failure rate of Apache web server and issues a Critical condition whenever the server failures rate is greater than 1. Its formula is as follows:

If

Apache_Web_Sites.Server_Failures_Rate is greater than 1

then

the situation Apache_Site_failed is true.

Apache_Site_trafic Monitors the count of kilobytes sent and received and issues a Warning condition whenever the kilobytes rate is greater than 10,000,000. Its formula is as follows:

If

Apache_Web_Sites.Kilobytes_Rate is greater than 10,000,000

then

the situation Apache_Site_trafic is true.

Apache_Site_requests Monitors the rate at which the Apache HTTP requests were made and issues a Warning condition whenever the request rate is greater than 100,000. Its formula is as follows:

If

Apache_Web_Sites.Request_Rate is greater than 100,000

then

the situation Apache_Site_requests is true.

Apache_Site_fail_logins Monitors the count of failed logins and issues a Warning condition whenever the failed login rate is greater than 100. Its formula is as follows:

If

Apache_Web_Sites.Failed_Login_Rate is greater than 100

then

the situation Apache_Site_fail_logins is true.

Apache_Site_fail_pages Monitors the rate of failed pages and issues a Warning condition whenever the failed pages rate is greater than 1,000. Its formula is as follows:

If

Apache_Web_Sites.Failed_Pages_Rate is greater than 1,000

then

the situation Apache_Site_fail_pages is true.

SWebSrvStoped Monitors the status of the Sun web server and issues a Critical condition when the server stops. Its formula is as follows:

If

Sun_Web_Server.Server_Status equals 0

then

the situation SWebSrvStoped is true.

SWebSrvHFrMEM Monitors the fraction of system memory that is being used by the web server instance process and issues a Warning condition whenever the system memory usage is greater than 80%. Its formula is as follows:

If

Sun_Web_Server.Process_Size_Fraction_System_Memory_Usage is greater than 80

then

the situation SWebSrvHFrMEM is true.

SWebSrvCONQLIM Monitors the numbers of connections in the connection queue and issues a Warning condition whenever the count is greater than 100. Its formula is as follows:

If

Sun_Web_Server.Connection_Queue_Count is greater than 100

then

the situation SWebSrvCONQLIM is true.

SWebSrvKPALQLIM Monitors the number of connections in the keepalive queue and issues a Warning condition whenever the number exceeds 100. Its formula is as follows:

If

Sun_Web_Server.Keepalive_Queue_Count is greater than 100

then

the situation SWebSrvKPALQLIM is true.

SWebSrvHNetSent Monitors the kilobytes transmitted on the network of the Sun web server and issues a Warning condition whenever the number exceeds 10,000,000 kilobytes per second. Its formula is as follows:

If

Sun_Web_Server.Kilobytes_Out_Rate is greater than 10,000,000

then

the situation SWebSrvHNetSent is true.

SWebSrvHNetRecv Monitors the kilobytes received on the network of the Sun web server and issues a Warning condition whenever the number exceeds 10,000,000 kilobytes per second. Its formula is as follows:

If

Sun_Web_Server.Kilobytes_In_Rate is greater than 10,000,000

then

the situation SWebSrvHNetRecv is true.

SVWebStHNetRecv Monitors the kilobytes received on the network of the Sun website and issues a Warning condition whenever the number exceeds 10,000,000 kilobytes per second. Its formula is as follows:

If

Sun_Web_Sites.Kilobytes_In_Rate is greater than 10,000,000

then

the situation SWebStHNetRecv is true.

SVWebStHNetSent Monitors the kilobytes transmitted on the network of the Sun website and issues a Warning condition whenever the number exceeds 10,000,000 kilobytes per second. Its formula is as follows:

If

Sun_Web_Sites.Kilobytes_Out_Rate is greater than 10,000,000

then

the situation SWebStHNetSent is true.

SVWebStFailed Monitors the percentage of failed responses violation and issues a Critical condition whenever the percentage exceeds 50%. Its formula is as follows:

If

Sun_Web_Sites.Percentage_of_failed_responses_violation is greater than 50

then

the situation SVWebStFailed is true.

SVWebStServErr Monitors the percentage of server error violations and issues a Critical condition whenever the percentage exceeds 50%. Its formula is as follows:

If

Sun_Web_Sites.Percentage_of_server_errors_violation is greater than 50

then

the situation SVWebStServErr is true.

SVWebStUnAuthErr Monitors the percentage of unauthorized response violations and issues a Warning condition whenever the percentage exceeds 50%. Its formula is as follows:

If

Sun_Web_Sites.Percentage_of_unauthorized_responses_violation is greater than 50

then

the situation SVWebStUnAuthErr is true.

SVWebStSucssfResp Monitors the percentage of successful response violations and issues a Critical condition whenever the percentage exceeds 50%. Its formula is as follows:

If

Sun_Web_Sites.Percentage_of_successful_responses_violation is greater than 50

then

the situation SVWebStSucssfResp is true.

Take Action commands for ITCAM Agent for HTTP Servers

The Take Action commands allow your interactive Tivoli Enterprise Portal users enter a command or stop or start a process at any system in your network where one or more Tivoli Enterprise Monitoring Agents are installed. The ITCAM Agent for HTTP Servers Take Action commands allow you to use the Tivoli Enterprise Portal interface to start, stop, or restart a web server or a website.

Users can run a Take Action command from a workspace, from the Navigator, from a situation that you create, in an improvised mode, or by recalling a saved Take Action command. For details about using these general commands, see the online help for Tivoli Enterprise Portal.

Predefined Take Action commands for Apache web servers

StartServer: Start an Apache web server

Use the StartServer command to start an Apache web server instance.

Command syntax

HT:startServer

StopServer: Stop an Apache web server

Use the StopServer command to stop an Apache web server instance.

Command syntax

HT:stopServer

RestartServer: Restart an Apache web server

Use the RestartServer command to restart an Apache web server instance.

Command syntax

HT:restartServer

Predefined Take Action commands for Sun web servers

StartServer: Start a Sun web server

Use the StartServer command to start a Sun web server.

Command syntax

HT:startServer

StopServer: Stop a Sun web server

Use the StopServer command to stop a Sun web server.

Command syntax

HT:stopServer

RestartServer: Restart a Sun web server

Use the RestartServer command to restart a Sun web server.

Command syntax

HT:restartServer

Glossary for ITCAM Agent for HTTP Servers

A

Apache HTTP server An open source web server. IBM offers a web server, called the IBM HTTP Server, which is based on Apache.

application server A program in a distributed network that provides the execution environment for an application program.

attribute Data associated with a component. For example, a web server component might have attributes such as web server name, WWW server status, node name, origin node, interval time, and so on.

attribute group A set of related attributes that can be combined in a view or a situation. For example, the Apache web server attribute group and the Sun websites attribute group in the ITCAM Agent for HTTP Servers.

H

HTTP Hypertext Transfer Protocol. A suite of protocols for the Internet that transfer and display hypertext documents.

HTTP request A transaction initiated by a web browser and adhering to HTTP. The server usually responds with HTML data, but can send other kinds of objects as well.

I

IBM Tivoli Monitoring platform The software architecture and foundation that support the development and operations of Tivoli Enterprise Portal and its Tivoli Enterprise Monitoring Agents.

J

J2EE Java 2 Platform, Enterprise Edition. An environment for developing and deploying enterprise applications using the Java language. The J2EE platform consists of a set of services, application programming interfaces (APIs), and protocols that provide the functions needed for developing multi-tiered, Web-based applications.

Java An object-oriented programming language for portable interpretive code that supports interaction among remote objects. Java was developed and specified by Sun Microsystems, Incorporated.

JSP Java server page. A web page that specifies one or more servlets whose execution on the web server modifies the page content or appearance before it is presented to the user.

M

monitor 1) A transaction environment for maintaining large quantities of data in a consistent state and that controls which users and clients can access data through authorized servers. 2) A programming primitive created so multiple program threads can share the same resource (such as an object). A program creates a monitor for a given resource by requesting it from the system; the system returns a unique ID for that monitor. After that, any thread needing the resource must use the monitor to lock the resource while the thread is using it. If the monitor is already locked, a thread requesting the resource is queued by the system and then given control when the monitor becomes unlocked. Also called a mutex.

monitored application An application that interfaces with a Tivoli Privacy Manager monitor to enable access to monitored items that flow between the application and the monitored system.

N

node Any managed system, such as a web server, that the Tivoli Enterprise Portal is monitoring. A node can also be a managed system of subnodes being managed under a primary node.

R

request The entry point into an application whose processing or response time directly affects the response time the user perceives.

S

server In a network, hardware, or software that provides facilities to clients. Examples of a server are a file server, a printer server, or a mail server.

session A series of requests to a servlet that originate from the same user at the same browser. Using sessions, applications running in a web container can track individual users.

T

thread pool The threads that are being used by or are available to a computer program.

U

URI Uniform Resource Identifier. An identifier for a point of content on the Internet, be it a page of text, a video or sound clip, a still or animated image, or a program. The most common form of URI is the web page address, which is a particular form of URI called a Universal Resource Locator (URL). A URI typically describes the mechanism used to access the resource, the computer that houses the resource, and the name of the resource (such as a file name) on that computer.

URL Universal Resource Locator. The unique address for a file accessible via the Internet. Such a file might be a web page (usually the home page), an image file, or a program such as a Java applet or servlet. The URL comprises the protocol used to access the file, a domain name that identifies a specific computer on the Internet, and a path name that specifies that file location on that computer.

V

virtual server A server that shares its resources with other servers to support applications.

W

Web Server A software program that can service Hypertext Transfer Protocol (HTTP) requests.

Web service A self-contained, self-describing modular application that can be published, discovered, and invoked over a network using standard network protocols. Typically, XML is used to tag the data, SOAP is used to transfer the data, WSDL is used to describe the services available, and UDDI is used for listing what services are available.

Website A related collection of files available on the web that is managed by a single entity (an organization or an individual) and contains information in hypertext for its users. A website often includes hypertext links to other websites.

workspace A window composed of one or more views.

Part 3. Appendixes

Appendix. Accessibility

Accessibility features help users with physical disabilities, such as restricted mobility or limited vision, to use software products successfully.

The accessibility features in the product enable users to:

- Use assistive technologies, such as screen reader software and digital speech synthesizers, to hear what is displayed on the screen. Consult the product documentation of the assistive technology for details on using the technology with this product.
- Perform tasks with the software using only the keyboard.

General Navigation

Each page has four main sections:

- Headerbar
- Toolbar
- Main tabs
- Content

Each page has navigation points for screen readers. The following navigation points are all H1:

- Title bar
- Main tabs
- Main form
- Section labels
- Table labels

Menu Navigation

You use the Go To menu at the top of the screen to navigate to any of the applications that you have access to. The Go To menu is a cascading menu that is three levels deep at its deepest point. The following instructions describe how to get started with JAWS:

1. To get to the Go To menu press Alt+G.
2. When you open the menu, JAWS reads the first application in the menu. If JAWS does not begin to read the entry, restart the screen reader.
3. Navigate the list of applications in the menus by using the arrow keys.
4. JAWS indicates if a menu item has submenus. To get to a submenu, press the right arrow or enter.
5. Press the left arrow to move up a level in the hierarchy. If you press the left arrow at the highest level of the Go To menu, you leave the menu completely.
6. Press the Enter key to enter an application.

Accessibility help

The Accessibility Help panels provide details on general navigation, menu navigation, and hot keys. Click **Accessibility Help** from the toolbar of the product to access the help panels.

Screen reader setting

The product contains a screen reader flag. When you turn on the screen reader flag, the user interface is optimized to work with JAWS for Windows®. You use the **User** tab in the Users application to turn on the screen reader flag.

Keyboard shortcuts

You can navigate within the applications by using a combination of keys.

Accessible reports

To use the accessibility tools to read reports, you must access the reports in Microsoft Excel. In the reports applications, select the **Run Reports** option in the **Select Action** menu. With this option, you can email an .xls file version of a report to yourself at a scheduled time.

IBM and accessibility

For more information about the commitment that IBM has to accessibility, see the IBM Human Ability and Accessibility Center. The IBM Human Ability and Accessibility Center is at the following web address: http://www.ibm.com/able

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