

IBM Tivoli Composite Application Agent for Applications
Version 7.2 Fix Pack 1

BPM Monitoring Deployment Guide



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About this publication

This publication provides an overview of monitoring of IBM® Business Process Management (BPM) environments using ITCAM for Applications agents.

Intended audience

This publication is for administrators who plan deployment of ITCAM for Applications agents for monitoring BPM environments.

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.

ITCAM for Applications library for ITCAM for SOA

The following publications are included in the ITCAM for Applications library, available in the ITCAM for Applications Information Center:

- *IBM Tivoli Composite Application Manager for SOA Installation Guide*
Provides an overview of the IBM Tivoli Management Services environment and the planning information and procedures you need to install and upgrade the application support files and the monitoring agent in a distributed operating system environment.
This guide also includes procedures for configuring support for the service-to-service topology function, including creating databases and configuring SOA Domain Management Server and Tivoli Common Object Repository in your Tivoli Enterprise Portal Server environment.
This guide also includes procedures for enabling and disabling the various supported runtime environments for data collection by the ITCAM for SOA, version 7.2 and later monitoring agent, and optional administrative tasks to further configure your installation.
- *IBM Tivoli Composite Application Manager for SOA User's Guide*
Provides information on monitoring and managing resources in the Tivoli Enterprise Portal environment, including details about Take Action commands, situations, workspaces and views, including service-to-service topology workspaces and views. Some problem determination information about the various components of ITCAM for SOA is also provided, as well as information about log files and informational, warning, and error messages. This publication complements the Tivoli Enterprise Portal online help information for this monitoring agent.
- *IBM Tivoli Composite Application Manager for SOA Tools*
Provides information about installing and using the IBM Web Services Navigator, an Eclipse based plugin for extracting services information that has been collected by monitoring agents and stored, either locally or in a historical database. This tool provides the capability to retrieve historical metric data from a connected database, or assemble several locally stored metric and content log files, and display the resulting data in several views to assist a services architect in visualizing relationships between services.
- *IBM Tivoli Composite Application Manager for Discovery Library Adapters Guide*

Provides information about installing and running the following discovery library adapters (DLAs) provided with ITCAM for SOA: WebSphere® Service Registry and Repository Discovery Library Adapter, Business Process Execution Language for Web Services Discovery Library Adapter, and IBM Tivoli Composite Application Manager for SOA Discovery Library Adapter.

- *IBM Tivoli Composite Application Manager for SOA Troubleshooting Guide*
Provides information about recovering from problems that you might encounter while installing, configuring, and using the product. Typical problem scenarios are described, and recovery procedures are provided. Error messages for the product are also documented in this guide.
- *IBM Tivoli Composite Application Manager for SOA WSRR Integration Guide*
Provides information about integrating ITCAM for SOA version 7.2 with WebSphere Services Registry and Repository version 7.5 or later. The procedure for subscribing to WSRR events related to service-level definitions and the procedure for creating and deploying an SDMS configuration file is documented. The configuration file defines the rules for processing WSRR events in SDMS. Based on these rules, situations are automatically created, updated, or deleted by IBM Tivoli Monitoring when a lifecycle changes notification is received from WSRR.
- *IBM Tivoli Composite Application Manager for SOA BPM Monitoring Deployment Guide*
Provides information about implementing an IBM BPM monitoring solution.
- *IBM Tivoli Composite Application Manager for SOA Reports Guide*
Provides information about installing and using ITCAM for SOA 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_Documentation_Central
- 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/>

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 Documentation Central website at [https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/Tivoli Documentation Central](https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/Tivoli_Documentation_Central)

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

Ordering publications

You can order many Tivoli publications online at: <http://www.ibm.com/e-business/weblink/publications/servlet/pbi.wss>.

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 <http://www.ibm.com/e-business/weblink/publications/servlet/pbi.wss>
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 all features of the graphical user interface.

For additional information, see “Accessibility,” on page 9.

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 Application Performance Management 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, refer to the following IBM Tivoli Education website:

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

Tivoli user groups

Tivoli user groups are independent, user-run membership organizations that provide Tivoli users with information to assist them in the implementation of Tivoli Software solutions. Through these groups, members can share information and learn from the knowledge and experience of other Tivoli users. For more information about Tivoli Users Group, see <https://community.ibm.com/community/user/imwuc/home>.

Support 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:

Online

Access the IBM Software Support site at <http://www.ibm.com/software/support/probsub.html>.

Troubleshooting Guide

For more information about resolving problems, see the *IBM Tivoli Composite Application Manager for SOA Troubleshooting Guide*.

Conventions used in this publication

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

Typeface conventions

This publication 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, list boxes, items inside list boxes, multicolumn lists, containers, menu choices, menu names, tabs, property sheets), labels (such as **Tip:**, and **Operating system considerations:**)
- Keywords and parameters in text

Italic

- Citations (examples: titles of publications, diskettes, and CDs)
- Words defined in text (example: a nonswitched line is called a *point-to-point line*)
- Emphasis of words and letters (words as words example: “Use the word *that* to introduce a restrictive clause.”; letters as letters example: “The LUN address must start with the letter *L*.”)

- New terms in text (except in a definition list): a *view* is a frame in a workspace that contains data.
- Variables and values you must provide: ... where *myname* represents....

Monospace

- Examples and code 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

Chapter 1. BPM monitoring in ITCAM for Applications

ITCAM for Applications delivers a BPM monitoring solution that enables you to monitor the key performance metrics of business processes in your environment. Use this solution to optimize the performance and availability of BPM solutions.

The solution provides the following two broad areas of functionality:

- **Monitoring and diagnostic procedures:** the BPM monitoring solution tracks the health and performance of IBM Business Process Manager components. It supports both SCA components and Business Process Definitions (BPDs). The solution enables you to perform a root cause analysis of a problem with a business process running on IBM BPM. You can trace process issues to the IT infrastructure that supports your BPM environment. Use this solution to identify the IT-related root cause of a BPM-related problem. BPM monitoring provides the linkage that relates the performance of business processes to the IT infrastructure that supports it.
- **Impact analysis:** the BPM monitoring solution links IT resource issues to impact on BPM processes. You can identify the BPM processes that are affected by a specific problem at the IT resource level. Use the BPM solution to prioritize the repair of problems based on impact at the BPM solution level.

Chapter 2. Deploying BPM monitoring in ITCAM for Applications

To use the BPM monitoring capabilities of ITCAM for Applications, you must install the IBM Tivoli Monitoring infrastructure. You must also install both ITCAM for SOA and ITCAM Agent for WebSphere Applications on the monitored application servers, as well as the additional Tivoli Monitoring infrastructure support required by these agents.

If you only use one of the agents, some of the workspaces are still available. However, both agents are required for an integrated BPM monitoring solution.

Tivoli Monitoring infrastructure

You must deploy the IBM Tivoli Monitoring infrastructure, which is available as a part of ITCAM for Applications. It includes several server components, normally installed on multiple hosts. To view monitoring information, you can use a Web client or a stand-alone client application.

The Tivoli Monitoring infrastructure consists of the following components:

- A Tivoli Enterprise Portal Server (TEPS). This server provides the user with the monitoring information. The user can access the TEPS via a browser with Java™, or use a separate Tivoli Enterprise Portal client.
- One or more Tivoli Enterprise Monitoring Servers (TEMS). These servers interact with agents on application servers to collect all monitoring data and pass on any management information. Some Tivoli Enterprise Monitoring Servers are designated as *hub* Servers. These servers communicate with the TEPS. Other servers are known as *remote* servers, and communicate with hub servers.
- Tivoli Data Warehouse (TDW), a database that stores historical monitoring data.

For details on planning and deploying monitoring infrastructure, see the *IBM Tivoli Monitoring Installation and Setup Guide*.

ITCAM for SOA

To view BPM solution health and topology workspaces, you need to install ITCAM for SOA on every monitored host. You also need to deploy several additional components on the monitoring infrastructure servers.

ITCAM for SOA, as deployed on a BPM host, consists a monitoring agent and a data collector, known as ITCAM Data Collector for WebSphere. ITCAM for SOA also includes other data collectors for different application servers.

You must configure the data collector for every application server instance that you want to monitor. The data collector saves request information into metric files on the local disk.

The monitoring agent reads data from the metric files and provides it to Tivoli Enterprise Monitoring Servers.

You must also install the following additional components on the Tivoli Enterprise Portal Server:

- SOA Domain Management Server (SDMS). It aggregates information received from various servers and prepares a single view of service-to-service topology. SDMS also manages interaction between ITCAM for SOA and WebSphere Service Registry and Repository. Install SDMS on the Tivoli Enterprise Portal Server.
- ITCAM for SOA application support files provide information on ITCAM for SOA workspaces and attributes within Tivoli Monitoring. Install the application support files on the Tivoli Enterprise Portal Server and all Tivoli Enterprise Monitoring Servers. If self-describing agents are enabled and supported in your environment, the application support files are installed automatically.

For details on installing ITCAM for SOA, see the *ITCAM for SOA Installation Guide*.

See the Software product compatibility reports website to generate various reports that are related to product and component requirements.

To view the system requirements for server-side components in ITCAM for SOA version 7.2 and later, see the Server-side components detailed system requirements report.

To view the system requirements for agent-side components in ITCAM for SOA version 7.2 and later, see the Agent-side components detailed system requirements report.

ITCAM Agent for WebSphere Applications

To view application health and request analysis workspaces for BPM applications, as well as other application details, you need to install ITCAM Agent for WebSphere Applications on every monitored host. You also need to deploy its support files on the monitoring infrastructure.

Agent for WebSphere Applications consists of a monitoring agent and a data collector. The data collector, known as ITCAM Data Collector for WebSphere, is shared with ITCAM for SOA. You must install the data collector only once, but you must configure it to collect information for both ITCAM Agent for WebSphere Applications and ITCAM for SOA.

The monitoring agent connects to the Data Collector, receives request information, and provides it to Tivoli Monitoring Servers.

You must also install support files for this agent on the Tivoli Enterprise Portal Server and every Tivoli Enterprise Monitoring Server.

For details on installing ITCAM Agent for WebSphere Applications, see the *ITCAM Agent for WebSphere Applications Installation and Configuration Guide*.

Important: For the prerequisites for ITCAM Agent for WebSphere Applications version 7.2, see the Detailed software requirements report.

See the Software product compatibility reports website to generate a variety of reports related to product and component requirements. ITCAM Agent for WebSphere Applications version 7.2 is a component of ITCAM for Applications version 7.2. To run a report specific to ITCAM for Applications version 7.2, specify Tivoli Composite Application Manager for Applications as the product name and 7.2 as the version.

Chapter 3. Viewing BPM monitoring information in ITCAM for Applications

ITCAM for Applications provides easy access to key monitoring information about the health and performance of IBM Business Process Manager applications. You can "drill down" to more detailed information as necessary. You can also determine the impact that an application layer issue has on business processes.

In the Tivoli Enterprise Portal, you can view BPM information at several levels:

- The *Group summary* workspace displays aggregated information for BPM components that support every process. Each process is represented by a *process group*, which contains all components involved in the process. You can customize process groups to ensure that they reflect the process setup in your environment. ITCAM displays a black (fatal), red (critical), or yellow (warning) status icon if the performance of a process group is not satisfactory, and a down arrow status icon if the process is unavailable.
- *Operational Flow* (topology) workspaces display the flow of requests between BPM components, as well as between these components and external systems and services. You can view the topology for your entire environment or for a process group. When you select a component, you can view the interaction detail topology for it. Individual components that have unsatisfactory performance are flagged with red and yellow icons. For every component, as well as for external systems and services, you can view a details dialog that shows additional information and performance metrics.

Important: If you use several servers (instances) to implement the same process components in a distributed environment, topology workspaces aggregate information from the servers. Interaction detail views are available for individual instances.

- The *Business Process Manager Summary* workspace displays the information about the real-time health status of a BPM server that provides the runtime environment for business process components. You can use this workspace to access detailed information about the performance of the server.

Group summary

In the group summary workspace, you can view a high-level overview of the health of all process groups.

ITCAM for SOA provides this workspace.

To access the group summary workspace, in the navigator pane of Tivoli Enterprise Portal select the **ITCAM for SOA** view. Then click the **Services Management** node. You can also access it by links from other workspaces.

A process group is a group of components within a BPM environment that supports a particular process. You create process groups manually, according to the process layout in your environment.

Within the group summary workspace, you can view the following information:

- The status for every group (green, yellow, red, or black).

- Indication for any unavailable group.
- Charts showing the throughput for each group.
- A table of status and throughput for each group.

You can use this workspace to determine whether any process might be a cause for concern because of a high response time or an unusually high or low throughput. To view further detail on a process, double-click the process group icon to access its operation flow workspace.

Operational flow

The operation flow workspace displays the topology of interactions between components in the BPM environment. You can display the topology for your entire BPM and SOA environment, for a particular process group, or for a single server.

ITCAM for SOA provides this workspace.

You can access the operational flow for your entire environment, in the navigator pane of Tivoli Enterprise Portal select the **ITCAM for SOA** view. Then right-click the **Services Management** node and select **Workspaces > Operational Flows**. You can also access operational flow views by links from other workspaces.

The same process component can be implemented on several servers in various geographic locations. Such implementations are called *instances*. For the top-level *flow* view, ITCAM for SOA aggregates instances of a component into a single entry, called an *aggregate*. In this view, you can see a concise summary of the interaction logic within business processes.

Double click a component icon to open an *interaction detail* view for a component. This view shows the individual component instances and their interaction with other components, services, and external systems.

BPM components are included as nodes in the topology workspace. The details dialog for nodes show details specific to the operation type, as well as response time metrics.

For example, for a mediation flow, the details dialog shows a list of all mediation primitives and the performance metrics for each primitive.

To investigate the server that runs a component, you can right-click the component node and select **Link To > Server Summary** to access the Business Process Manager Summary workspace.

Business Process Manager Summary

The Business Process Manager Summary workspace displays the information about the real-time health status of a BPM server that provides the runtime environment for business process components.

ITCAM Agent for WebSphere Applications provides this workspace.

To access the Business Process Manager Summary workspace, in the navigator pane of Tivoli Enterprise Portal, select the application server host node, then its

Business Process Manager or **WebSphere Process Server** agent subnode. You can also access the Business Process Manager Summary workspace by links from topology workspaces.

Use the workspace to determine issues with the BPM server. You can view statistics for the following server resources:

- Operating system (OS):
 - Platform CPU used
 - System paging rate
- JVM:
 - JVM CPU usage trend
 - JVM heap usage
 - Garbage Collection time used
- Data sources (JDBC, JMS, JCA, and JTA):
 - Query Times
 - Update Times
- Thread pools:
 - Average thread pool usage
 - Highest average thread pool sizes
 - Usage statistics for individual thread pools, such as average and maximum pool sizes and creation and destruction rates

The workspace also lists the applications running on the BPM server.

You can right-click any resource and select **Link To > Operation Flow for Application Server** to view the Operation Flow for Application Server workspace. The workspace displays the operation flow that includes the components running on this server.

You can also right-click any application and select **Link To > Selected Application - Groups Summary** to view the Group Summary workspace for this application. 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.

Application Health

The Application Health workspace displays the information about the real-time health status of applications on a BPM server.

ITCAM Agent for WebSphere Applications provides this workspace.

To access the Application Health workspace, in the navigator pane of Tivoli Enterprise Portal, expand the application server host node and its **Business Process Manager** or **WebSphere Process Server** agent subnode, then click the **Application Health** subnode.

Use the workspace to determine issues with applications on the BPM server.

Health status information for every application 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.

In the Application Health Summary view within this workspace, right-click any application and select **Link To > Selected Application - Groups Summary** to view the Group Summary workspace. 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.

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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