Tivoli Tivoli Decision Support for z/OS

IBM

Version 1.8.1

Monitoring Agent Guide

SC23-7968-01

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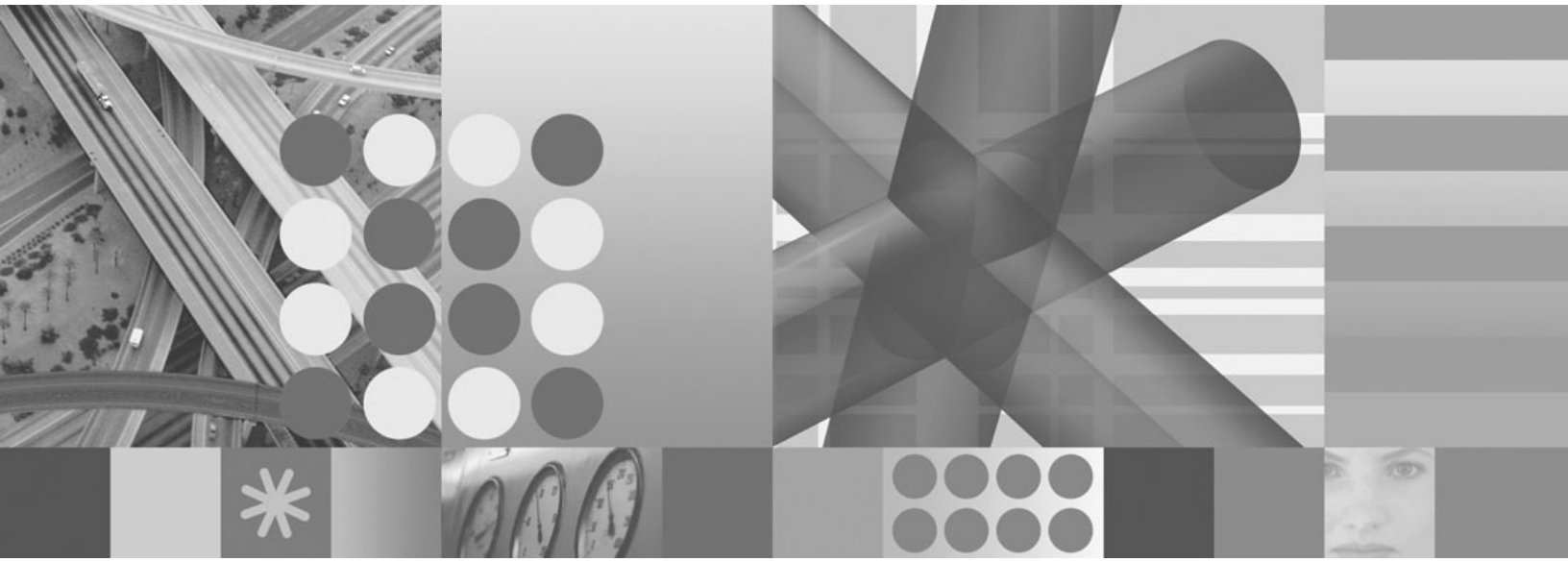

Monitoring Agent Guide

SC23-7968-01

Note

Before using this information and the product it supports, read the information in "Notices" on page 189.

Second edition (October 2009)

This edition applies to version 1, release 8, modification level 1 of Tivoli Decision Support for z/OS (program number 5698-B06) and to all subsequent releases and modifications until otherwise indicated in new editions.

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Preface

This book provides an introduction to the IBM® Tivoli® Decision Support for z/OS® Monitoring Agent. It describes how to view your collected and summarized data from within the Tivoli Enterprise Portal graphical user interface. The Tivoli Enterprise Portal is a part of IBM Tivoli Monitoring which includes a suite of products which can monitor your mainframe or distributed systems on a variety of platforms, and provide workstation-based reports you can use to track trends and troubleshoot system problems.

Who should read this book

The *Monitoring Agent Guide* book is is primarily for Tivoli Decision Support for z/OS users who wish to view Tivoli Decision Support for z/OS data from within the Tivoli Enterprise Portal graphical user interface.

What this book contains

This book is organized as a guide, demonstrating how to install and use the Monitoring Agent product. Its structure is as follows:

- Part 1, "Tivoli Decision Support for z/OS Monitoring Agent Overview," on page 1 introduces the Monitoring Agent and its use.
- Part 2, "Installation and Configuration," on page 79 explains how to install the Monitoring Agent.
- Part 3, "Problem Determination," on page 135 describes how to determine problems that may occur.
- The appendixes provide some supporting information:
  - Appendix A, "Mapping attributes to the Tivoli Decision Support for z/OS DB2 database," on page 173 details the link between the monitoring agents attribute groups and the DB2 table or views that the row data is being collected from.
  - Appendix B, "Support information," on page 185 explains how to obtain support for IBM software products.
- A glossary and index follow the appendixes.

Publications

This section lists publications in the Tivoli Decision Support for z/OS library and any other related documents. It also describes how to access Tivoli publications online, how to order Tivoli publications, and how to submit comments on Tivoli publications.

Tivoli Decision Support for z/OS library

The following documents are available in the Tivoli Decision Support for z/OS library:

- *Administration Guide and Reference*, SH19-6816

  Provides information about initializing the Tivoli Decision Support for z/OS database and customizing and administering Tivoli Decision Support for z/OS.
- *AS/400 System Performance Feature Guide and Reference*, SH19-4019

Provides information for administrators and users about collecting and reporting performance data generated by AS/400® systems.

- *CICS Performance Feature Guide and Reference*, SH19-6820

  Provides information for administrators and users about collecting and reporting performance data generated by Customer Information and Control System (CICS®).

- *Distributed Systems Performance Feature Guide and Reference*, SH19-4018

  Provides information for administrators and users about collecting and reporting performance data generated by operating systems and applications running on a workstation.

- *Guide to Reporting*, SH19-6842

  Provides information for users who display existing reports, for users who create and modify reports, and for administrators who control reporting dialog default functions and capabilities.

- *IMS Performance Feature Guide and Reference*, SH19-6825

  Provides information for administrators and users about collecting and reporting performance data generated by Information Management System (IMS™).

- *Language Guide and Reference*, SH19-6817

  Provides information for administrators, performance analysts, and programmers who are responsible for maintaining system log data and reports.

- *Messages and Problem Determination*, SH19-6902

  Provides information to help operators and system programmers understand, interpret, and respond to Tivoli Decision Support for z/OS messages and codes.

- *Monitoring Agent Guide*, SC23-7968

  Enables administrators and users to view their collected and summarized Tivoli Decision Support for z/OS data from within the Tivoli Enterprise Portal graphical user interface.

- *Network Performance Feature Installation and Administration*, SH19-6901

  Provides information for network analysts or programmers who are responsible for setting up the network reporting environment.

- *Network Performance Feature Reference*, SH19-6822

  Provides reference information for network analysts or programmers who use the Network Performance feature.

- *Network Performance Feature Reports*, SH19-6821

  Provides information for network analysts or programmers who use the Network Performance feature reports.

- *Resource Accounting for z/OS*, SH19-4495

  Provides information for users who want to use Tivoli Decision Support for z/OS to collect and report performance data generated by Resource Accounting for z/OS.

- *System Performance Feature Guide*, SH19-6818

  Provides information for performance analysts and system programmers who are responsible for meeting the service-level objectives established in your organization.

- *System Performance Feature Reference Volume I*, SH19-6819

  Provides information for administrators and users with a variety of backgrounds who want to use Tivoli Decision Support for z/OS to analyze z/OS, z/VM®, zLinux, and their subsystems, performance data.

- *System Performance Feature Reference Volume II*, SH19-4494

Provides information for administrators and users with a variety of backgrounds who want to use Tivoli Decision Support for z/OS to analyze z/OS, z/VM, zLinux, and their subsystems, performance data.

- *Usage and Accounting Collector User Guide*, SC23-7966

  Provides information about the functions and features of the Usage and Accounting Collector.
- *IBM Online Library z/OS Software Products Collection Kit*, SK3T-4270

  CD containing all z/OS documentation.

Accessing terminology online

The *Tivoli Software Glossary* includes definitions for many of the technical terms related to Tivoli software. The *Tivoli Software Glossary* is available, in English only, at the following Web site:

http://publib.boulder.ibm.com/tividd/glossary/tivoliglossarymst.htm

The IBM Terminology Web site consolidates the terminology from IBM product libraries in one convenient location. You can access the Terminology Web site at the following Web address:

http://www.ibm.com/ibm/terminology

Using LookAt to look up message explanations

LookAt is an online facility that lets you look up explanations for most of the IBM messages you encounter, as well as for some system abends (an abnormal end of a task) and codes. Using LookAt to find information is faster than a conventional search because in most cases LookAt goes directly to the message explanation.

You can use LookAt from the following locations to find IBM message explanations from z/OS elements and features, z/VM, VSE/ESA™, and Clusters for AIX® and Linux®:

- The internet. You can access IBM message explanations directly from the LookAt Web site at:

  http://www.ibm.com/eserver/zseries/zos/bkserv/lookat/
- Your z/OS TSO/E host system. You can install code on your z/OS systems to access IBM message explanations, using LookAt from a TSO/E command line (for example, TSO/E prompt, ISPF, or z/OS UNIX® System Services running OMVS).
- Your Microsoft® Windows® workstation. You can install code to access IBM message explanations on the (SK3T-4269), using LookAt from a Microsoft Windows DOS command line.
- Your wireless handheld device. You can use the LookAt Mobile Edition with a handheld device that has wireless access and an Internet browser (for example, Internet Explorer for Pocket PCs, Blazer, or Eudora for Palm OS, or Opera for Linux handheld devices.) Link to the LookAt Mobile Edition from the LookAt Web site.

You can obtain code to install LookAt on your host system or Microsoft Windows workstation from:

- A CD in the *z/OS Collection*, (SK3T-4269)
- The *z/OS and Software Products DVD Collection*, (SK3T-4271)

- The LookAt Web site (click **Download** and then select the platform, release, collection, and location that suit your needs). More information is available in the LOOKAT.ME files available during the download process.

Accessing publications online

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 Web site. Access the Tivoli software information center by first going to the Tivoli software library at the following Web address:

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

Scroll down and click the **Product manuals** link. In the Tivoli Technical Product Documents Alphabetical Listing window, click the Tivoli Decision Support for z/OS link to access the product library at the Tivoli software information center.

Note: 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 the following Web site:
http://www.elink.ibmlink.ibm.com/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.

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 the Accessibility Appendix in the *Administration Guide and Reference*.

Tivoli technical training

For Tivoli technical training information, refer to the following IBM Tivoli Education Web site:

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

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:

- 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 a variety of ways to contact IBM Software Support.

For more information about these three ways of resolving problems, see Appendix B, "Support information," on page 185.

Conventions used in this book

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

The following terms are used interchangeably throughout this book:
- MVS, OS/390®, and z/OS.
- VM and z/VM.

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

Italic

- Citations (titles of books, diskettes, and CDs)
- Words defined in text
- Emphasis of words (words as words)
- Letters as letters
- New terms in text (except in a definition list)
- Variables and values you must provide

`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

Except for editorial changes, updates to this edition are marked with a vertical bar to the left of the change.

Changes in this edition

This list summarizes the major changes made since the last release of TDS:

- New workspaces have been added:
  - "Coupling Facility Statistics workspace" on page 36.
  - "TCPIP Server Connections workspace" on page 39.
  - "Workload Statistics workspace" on page 43.
  - "zLinux Statistics workspace" on page 46.

Part 1. Tivoli Decision Support for z/OS Monitoring Agent Overview

Chapter 1. Tivoli Decision Support for z/OS and its environment

Tivoli Decision Support for z/OS is a reporting system that collects utilization and throughput data logged by computer systems. It then summarizes the data and stores it in a standard DB2® database. This data can be presented in a variety of forms using the reporting tools which are provided with the base product.

The Tivoli Decision Support for z/OS monitoring agent is a feature of Tivoli Decision Support for z/OS which allows you to view your collected and summarized data from within the Tivoli Enterprise Portal graphical user interface. The Tivoli Enterprise Portal is a part of Tivoli Monitoring Services which includes a suite of products that can monitor your mainframe or distributed systems on a variety of platforms, and provide workstation-based reports to track trends and troubleshoot system problems.

The Tivoli Decision Support for z/OS monitoring agent provides default workspaces which can be used to start viewing Tivoli Decision Support for z/OS data as soon as the monitoring agent software is installed and configured. The user interface supports several formats for viewing data, such as graphs, bar charts, and tables. Workspaces can also be customized to meet the needs of your enterprise.

The rest of this chapter describes the Tivoli Monitoring Services components and the Tivoli Enterprise Portal graphical interface in which the Tivoli Decision Support for z/OS monitoring agent displays its data. If you are already familiar with the components and operations of Tivoli Monitoring Services, you can skip to Chapter 2, “Workspaces overview,” on page 9.

Tivoli Monitoring Services

The client-server-agent implementation of Tivoli Monitoring Services includes the following components:

Tivoli Enterprise Portal client
: A graphical user interface for viewing and monitoring your enterprise. Tivoli Enterprise Portal offers two modes of operation: desktop and browser.

Tivoli Enterprise Portal Server
: This retrieves, manipulates, and analyzes data from the monitoring agents in your enterprise.

Tivoli Enterprise Monitoring Server
: This acts as a collection and control point for alerts and data received from the monitoring agents.

Monitoring agents installed on the systems or subsystems you want to monitor
: These monitoring agents collect and distribute data to a Tivoli Enterprise Monitoring Server.

Tivoli Data Warehouse
: An optional long-term data store for the performance and analysis data collected by the monitoring agents; and a warehouse proxy.

Tivoli Enterprise Portal

The monitoring agents, including the Tivoli Decision Support for z/OS monitoring agent, use the Tivoli Enterprise Portal to provide a view of your enterprise from which you can drill down to examine details about each system being monitored. Its application window consists of a Navigator that shows all the systems in your enterprise where monitoring agents are installed, and a workspace that includes table and chart views of system and application conditions. Each workspace is designed to help monitor a specific component of your system. In the case of the Tivoli Decision Support for z/OS monitoring agent, each workspace displays data for different Tivoli Decision Support for z/OS components. A table of attributes is provided for each workspace.

Each attribute represents a particular kind of data about system resources being monitored and reported. Attributes can also be used to define situations to test for specific conditions. When the conditions for a situation are met, situation event indicators are displayed in the Navigator. Please note that as data displayed in the Tivoli Decision Support for z/OS monitoring agent's workspaces is already historical in nature, situations are not used by this agent.

The Tivoli Enterprise Portal client has two modes of operation:

desktop
The application software is installed on your system.

browser
Access the Tivoli Enterprise Portal from a browser, using the Web address of the Tivoli Enterprise Portal Server. In browser mode, the software is downloaded to your system the first time you log on to Tivoli Enterprise Portal, and thereafter only when there are software updates. You can find detailed instructions for using Tivoli Enterprise Portal in the Tivoli Enterprise Portal online help and in the IBM Tivoli Monitoring publications.

The Navigator

The physical Navigator view shows the hierarchy of your monitored enterprise, from the top level (Enterprise) down to individual groupings of information collected by the monitoring agents. When you click an item in the Navigator, its default workspace displays in the application window.

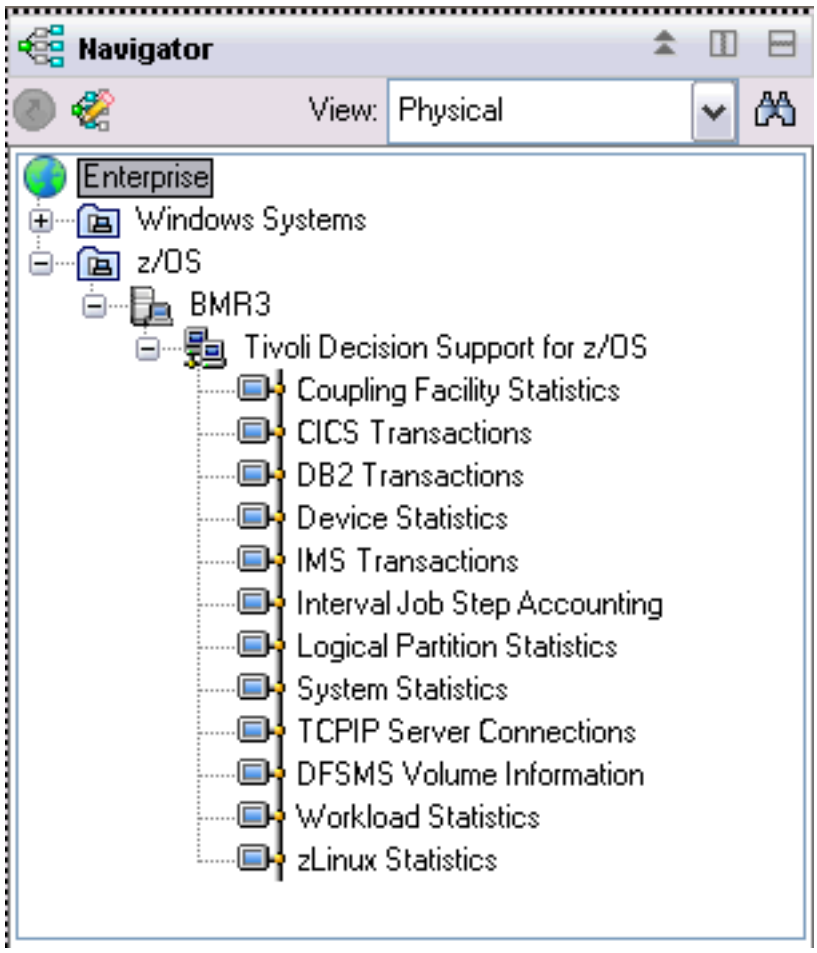

Figure 1. Tivoli Enterprise Portal Navigator

The Tivoli Enterprise Portal Navigator provides a physical view of your monitored enterprise. Under the nodes that represent the monitoring agents, you can find a list of workspaces for the data collected by each agent.

Workspaces

A *workspace* is the work area of the Tivoli Enterprise Portal application window and is made up of one or more views. A *view* is a pane in the workspace (typically a chart, graph, or table) showing data collected by a monitoring agent.

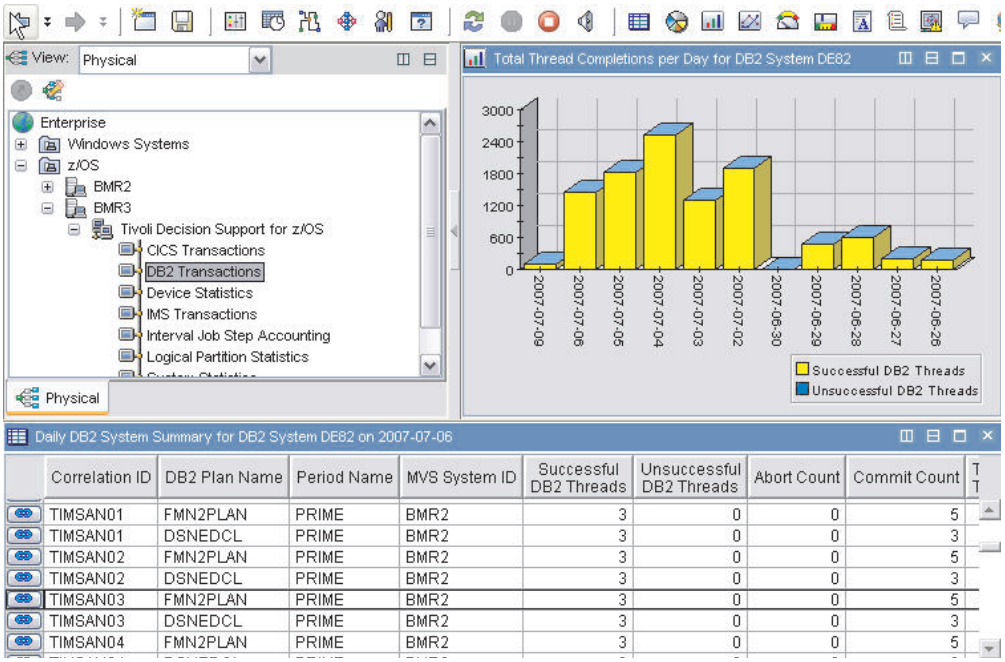

Figure 2. Tivoli Enterprise Portal workspace

When you select items in the Navigator, each workspace presents views relevant to your selection. Every workspace has at least one view, and every view has a set of properties associated with it. You can customize the workspace by working in the Properties Editor to change the style and content of each view. You can also change, add, and delete views on a workspace.

Tivoli Enterprise Portal can present data in the following types of graphical views:

- Table view
- Pie chart view
- Bar chart view
- Plot chart view
- Circular gauge view
- Linear gauge view

Additional function is provided in the following Tivoli Enterprise Portal views.

- Notepad view
- Message log view, showing the status of the situations associated with the system
- Take Action view, used to send a command to the monitored system
- Terminal view, from which you can start a 3270 or 5250 work session
- Browser view, from which you can open a browser to see HTML pages and Web sites

The Tivoli Decision Support for z/OS monitoring agent provides a set of predefined workspaces, which you can use to view Tivoli Decision Support for z/OS data immediately. As you become more familiar with the product, you can modify the predefined workspaces or create new workspaces. For more information about the predefined workspaces provided by the Tivoli Decision Support for z/OS monitoring agent product, see Chapter 3, “Workspaces provided by the Tivoli Decision Support for z/OS Monitoring Agent,” on page 13.

Each table view in a workspace corresponds to an attribute group, and each column of the table corresponds to an individual attribute from the group. A workspace can be linked to other workspaces from its table and charts. Some links are context-sensitive; you can right-click a row in a table or a graphic object in a chart to navigate to related or more detailed information.

Attributes

Tivoli Decision Support for z/OS stores systems management data in a standard DB2 database. The Tivoli Decision Support for z/OS monitoring agent which will be running on the same system as the main Tivoli Decision Support for z/OS product then gathers this data from the DB2 database, and stores the data in system elements called *attributes*. You can use these attributes to view Tivoli Decision Support for z/OS systems management data and build custom workspaces. Related attributes are grouped into attribute groups (also called attribute tables). Each table view contains information provided by a single attribute group. For a complete description of the Tivoli Decision Support for z/OS monitoring agent attributes, see Chapter 4, “Attributes,” on page 51 or the online help.

Using attributes in queries

Graph and table views use queries to specify which attribute values and monitored resources to request from a Tivoli Enterprise Monitoring Agent. You can use the Query Editor to create a new query, modify an existing one, or apply filters and set styles to define the content and appearance of a view based on an existing query. For instructions on using the Query Editor, see the Tivoli Enterprise Portal online help or IBM Tivoli Monitoring: User's Guide, SC32-9409. For some additional information on customizing queries for the Tivoli Decision Support for z/OS monitoring agent, refer to Chapter 5, “Creating queries,” on page 73.

Situations and situation events

A *situation* describes a condition or set of conditions that you set to determine whether a problem exists in one or more monitored systems and resources. A condition consists of an attribute, a value, and a comparison operator. The value of the attribute is compared with the value set for the condition to determine whether the condition is met.

The Tivoli Decision Support for z/OS monitoring agent does not provide any default situations and we do not recommend you use the situation editor to create your own situations for any attributes in the Tivoli Decision Support for z/OS monitoring agent. This is for two reasons:

- The data displayed in the Tivoli Decision Support for z/OS monitoring agent workspaces is historical in nature. Situations are only useful for real time monitoring agents where receiving alerts about current system performance or bottlenecks are critical so that immediate action can be taken on them. The data in the Tivoli Decision Support for z/OS monitoring agent workspaces can be days, weeks, and even several months old, so having a situation alert on these attributes would be pointless.
- Tivoli Decision Support for z/OS can contain vast amounts of data in its DB2 database. In some cases many millions of rows of data. Starting situations to constantly poll this data to compare attribute values could cause performance overhead for the monitoring agent, especially if multiple situations are running together. This could also cause high volumes of data to go through the network between the monitoring agent running on z/OS and the Tivoli Enterprise Portal on the distributed platform.

For instructions on using the situation editor for other monitoring agents, see the Tivoli Enterprise Portal online help or *IBM Tivoli Monitoring: User's Guide*, SC32-9409.

Chapter 2. Workspaces overview

Workspaces are at the heart of the Tivoli Enterprise Portal component of IBM Tivoli Monitoring, and provide access to the collected data for your Tivoli Decision Support for z/OS environment. Each workspace serves a unique purpose and displays a specific set of Tivoli Decision Support for z/OS data. Workspaces are split into multiple *views* that are used to display data in a meaningful way, such as tables and graph or charts.

The Tivoli Decision Support for z/OS monitoring agent product provides predefined workspaces, which you can access from the Navigator Tree in the Tivoli Enterprise Portal. Use these workspaces to view the data in the Tivoli Decision Support for z/OS DB2 databases on the host. The Tivoli Decision Support for z/OS workspaces are displayed in the Tivoli Enterprise Portal under the z/OS system on which you installed the monitoring agent.

Figure 3 shows the Navigator expanded to display the Tivoli Decision Support for z/OS predefined workspaces. In this case the Tivoli Decision Support for z/OS monitoring agent has been installed on a z/OS system called BMR3.

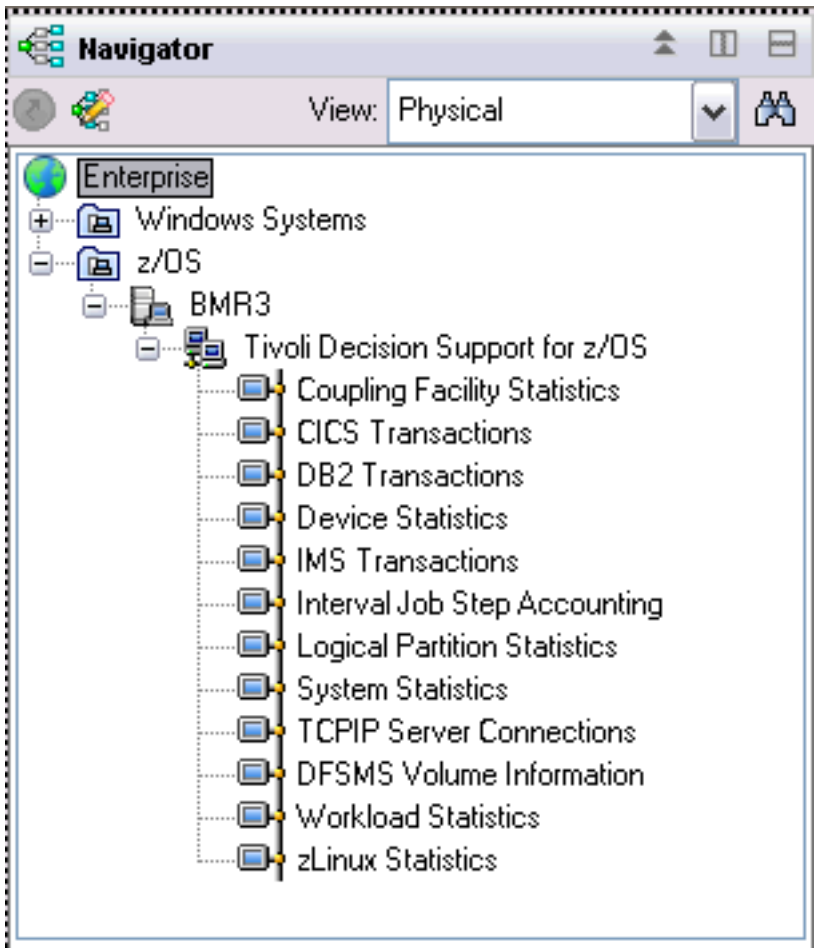

Figure 3. Tivoli Enterprise Portal Navigator example

As you select items in the Navigator, the workspace presents views pertinent to your selection. Each workspace has at least one view with a set of associated properties. You can customize the workspace by working in the Properties Editor to change the style and content of each view. You can resize views, add them to and remove them from workspaces, and change the types of view in a workspace.

For more information about customizing views and navigating workspaces, see the Tivoli Enterprise Portal online help or *IBM Tivoli Monitoring: User's Guide*. The rest of this chapter provides basic information about using workspaces in the Tivoli Enterprise Portal interface and describes the predefined workspaces provided with the Tivoli Decision Support for z/OS monitoring agent.

Workspace basics

This section explains how to access workspaces in the Tivoli Enterprise Portal interface and how to define workspace properties.

Accessing workspaces

When accessing workspaces in the Navigator, you can select a node to display a workspace. You can navigate to alternative workspaces for some of the nodes by right-clicking the node to see the other selections.

Subsidiary workspaces for each primary workspace are accessible by using workspace links from the table view in each of the primary workspaces. If the workspace's table view contains a link icon ( ) to the left of each row, you can 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 context menu. Figure 4 shows the results of right-clicking on the link icon in the **Daily Summary** view for the **DB2 Transactions** workspace. Here we can see one link available for this view, which is the **Daily DB2 System Summary** link. Clicking on this link will take you to the **Daily DB2 System Summary** workspace for the DB2 System ID and Date on the row which the link was clicked on.

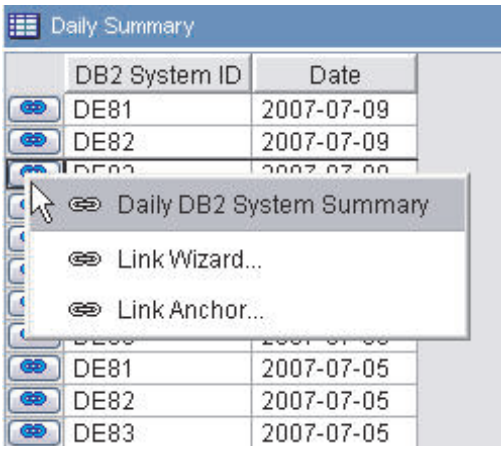

Figure 4. Space pull-down

For specific information on working with views (for example, splitting, closing, or expanding views), see the Tivoli Enterprise Portal online help or IBM Tivoli Monitoring: User's Guide.

Defining View Properties

Every view in a workspace has a set of properties which you can customize. Predefined workspaces are read-only. To change a workspace, copy it or perform a Save As operation and rename it. Changes you make to workspace properties, such as adding or editing a view, are temporary. They are lost when you exit Tivoli Enterprise Portal unless you save the workspace.

Adding a Workspace to your Favorites List

Each workspace has a unique web address. When using Tivoli Enterprise Portal in browser mode, you can display any workspace by entering the unique web address. You can save the workspace to your Favorites list or specify it as your home page.

Chapter 3. Workspaces provided by the Tivoli Decision Support for z/OS Monitoring Agent

This chapter summarizes the views and types of information displayed in each predefined workspace provided with the IBM Tivoli Decision Support for z/OS monitoring agent. It also describes how to navigate these views and workspaces.

Navigating the predefined workspaces

When the Navigator is expanded to display the Tivoli Decision Support for z/OS predefined workspaces, eight selectable workspaces are displayed in the tree. These are the top-level workspaces for each attribute group which is displayable by the IBM Tivoli Decision Support for z/OS monitoring agent (see Chapter 4, "Attributes," on page 51 for more information on Attribute Groups).

With the potentially vast amounts of data contained within the Tivoli Decision Support for z/OS DB2 database for each attribute group, the initial workspace is always a summary of what data is available to view in the more detailed workspaces for that group. This top-level workspace usually contains a list of distinct key attributes from the table, such as all the **DB2 System IDs** which have data to view on, as well as what **Dates** Tivoli Decision Support for z/OS has collected data for.

Figure 5 shows an example of a view in the top-level DB2 Transactions workspace:

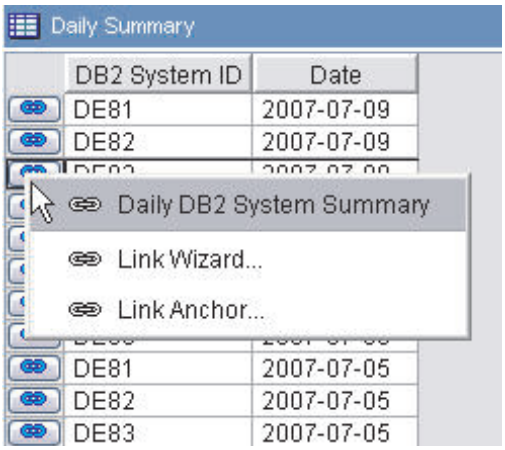

Figure 5. Linking from a top-level view

To get to the more detailed workspaces, use a process of 'drilling down' where you use the links available in the table views to link to additional workspaces for that attribute group. Every link which is available will take you to a new workspace, and pass the row data from the row you clicked the link on as parameters to the new workspace. The new workspace will then use these parameters to perform its query and then populate the views on the new workspace.

In the example in Figure 5, the link **Daily DB2 System Summary** has been selected against a row with a **DB2 System ID** of DE83 and a **Date** of 2007-07-09. The workspace this link takes you to will then display all the DB2 data from the Tivoli

Decision Support for z/OS database for the **DB2 System ID** DE83 on the **Date** 2007-07-09. In some cases there will be the opportunity to drill down to a third level workspace for even more detailed data for the particular attribute group which is displayed.

When you have drilled down to a second or third level workspace you can go back to the previously displayed workspace (back one level) by using the

Backward button () in the Tivoli Enterprise Portal client.

The predefined workspaces hierarchy

The list below shows the order and hierarchy of the predefined workspaces. Firstly the top level workspace for each attribute group is listed, followed by any second level and then third level (if any) workspaces for that attribute group.

- CICS Transactions
  - Weekly Transactions for CICS System
    - Weekly CICS Transaction History
    - Weekly CICS Transaction Performance
  - Daily Transactions for CICS System
    - Daily CICS Transaction History
    - Daily CICS Transaction Performance
  - Hourly Transactions for CICS System
    - Hourly CICS Transaction History
    - Hourly CICS Transaction Performance
- DB2 Transactions
  - Weekly DB2 System Summary
    - Weekly DB2 Correlation History
    - Weekly DB2 Correlation Performance
  - Daily DB2 System Summary
    - Daily DB2 Correlation History
    - Daily DB2 Correlation Performance
- Device Statistics
  - Hourly Device Summary for System
    - Hourly Device Summary for Device
    - Hourly Device Performance for System
    - Hourly Device Performance for Device
  - Hourly Device Performance for System
- IMS Transactions
  - Weekly IMS Transactions for IMS Subsystem
    - Weekly IMS Transaction Summary for Subsystem
    - Weekly IMS Transaction Performance for Subsystem
  - Weekly IMS Transactions for all IMS Subsystems
    - Weekly IMS Transaction Summary for all Systems
    - Weekly IMS Transaction Performance for all Systems
  - Daily IMS Transactions for IMS Subsystem
    - Daily IMS Transaction Summary for Subsystem

        - Daily IMS Transaction Performance for Subsystem
      – Daily IMS Transactions for all IMS Subsystems
        - Daily IMS Transaction Summary for all Systems
        - Daily IMS Transaction Performance for all Systems
      – Hourly IMS Transactions for IMS Subsystem
        - Hourly IMS Transaction Summary for Subsystem
        - Hourly IMS Transaction Performance for Subsystem
      – Hourly IMS Transactions for all IMS Subsystems
        - Hourly IMS Transaction Summary for all Systems
        - Hourly IMS Transaction Performance for all Systems
  - Interval Job Step Accounting
    – Monthly Job Summary for System
      - Monthly Job Summary for Job
    – Daily Job Summary for System
      - Daily Job Summary for Job
    – Hourly Job Summary for System
      - Hourly Job Summary for Job
  - Logical Partition Statistics
    – Monthly Statistics for LPAR
      - Monthly Processor Activity for LPAR
    – Daily Statistics for LPAR
      - Daily Processor Activity for LPAR
    – Hourly Statistics for LPAR
      - Hourly Processor Activity for LPAR
  - System Statistics
    – Monthly System Statistics for System
    – Daily System Statistics for System
    – Hourly System Statistics for System
  - DFSMS Volume Information
    – Monthly DFSMS Storage Group Summary
      - Monthly DFSMS Volume Summary
    – Daily DFSMS Storage Group Summary
      - Daily DFSMS Volume Summary
  - Coupling Facility Statistics
    – Hourly CF Structure Details for Sysplex
      - Hourly CF Structure History for System
      - Hourly CF Structure Performance for System
    – Hourly CF Structure Details for Type
      - Hourly CF Structure History for System
      - Hourly CF Structure Performance for System
  - TCPIP Server Connections
    – Hourly Connection Activity for System
      - Hourly Connection Activity for Port
      - Hourly Connection Performance for Port
      - Hourly Most Active Ports

- Daily Connection Activity for System
  - Daily Connection Activity for Port
  - Daily Connection Performance for Port
  - Daily Most Active Ports
- Weekly Connection Activity for System
  - Weekly Connection Activity for Port
  - Weekly Connection Performance for Port
  - Weekly Most Active Ports

- Workload Statistics
  - Hourly Workload Summary for System
    - Hourly Workload History for Service Class
    - Hourly Workload Performance for Service Class
  - Daily Workload Summary for System
    - Daily Workload History for Service Class
    - Daily Workload Performance for Service Class
  - Monthly Workload Summary for System
    - Monthly Workload History for Service Class
    - Monthly Workload Performance for Service Class
- zLinux Statistics
  - Hourly Node Summary for System
    - Hourly History for Node
    - Hourly Performance for Node
  - Hourly Performance for System
  - Daily Node Summary for System
    - Daily History for Node
    - Daily Performance for Node
  - Daily Performance for System
  - Monthly Node Summary for System
    - Monthly History for Node
    - Monthly Performance for Node
  - Monthly Performance for System

Predefined workspaces for CICS transactions

Following is a summary of all the predefined workspaces for the **CICS Transactions** attribute group.

CICS transactions workspace

The **CICS Transactions** workspace is the top-level workspace for viewing CICS Transaction information from the Tivoli Decision Support for z/OS DB2 tables. This workspace displays data provided by the CICS transactions attribute group (see "CICS Transactions attributes" on page 52).

This predefined workspace contains the following views:

- The **Weekly Summary** table displays a list of unique CICS System ID and Date attributes which have CICS Transaction data available in the weekly CICS Transactions table.

- The **Daily Summary** table displays a list of unique CICS System ID and Date attributes which have CICS Transaction data available in the daily CICS Transaction table.
- The **Hourly Summary** table displays a list of unique CICS System ID, Date, and Time attributes which have CICS Transaction data available in the hourly CICS Transactions table.
- The **Total Transaction Count for Latest Day** bar chart shows the total transaction count for each CICS System ID for the most recent day's data from the daily CICS Transactions table.

From the **Weekly Summary, Daily Summary, and Hourly Summary** tables you can link directly to one of the following workspaces to display all the CICS transactions which ran for the selected CICS System ID, Date, and Time (in the case of the Hourly Summary):

- Weekly Transactions for CICS System
- Daily Transactions for CICS System
- Hourly Transactions for CICS System

Right-click the link icon ( ) to the left of any row in the above tables to view the available links, or left-click on the link to take the default link for that table.

Weekly transactions for CICS system workspace

The **Weekly Transactions for CICS System** workspace is linked from the **CICS Transactions** workspace. This workspace displays details of all the CICS transactions which ran for the given CICS System ID for the week starting from the given Date. The CICS System ID and Date attribute values are passed from the row in the **Weekly Summary** table in the **CICS Transactions Workspace** via the **Weekly Transactions for CICS System** link to this workspace. This workspace displays data provided by the CICS Transactions attribute group (see "CICS Transactions attributes" on page 52).

This predefined workspace contains the following views:

- The **Weekly Transactions for CICS System** table displays a summary of all the CICS transactions which ran for the given CICS System ID for the week starting from the given Date.
- The **Weekly Transaction Count for CICS System** bar chart shows the total transaction count for each week for the given CICS System ID.

From the **Weekly Transactions for CICS System** table you can link directly to one of the following workspaces to display more detailed information on a particular Transaction ID:

- Weekly CICS Transaction History
- Weekly CICS Transaction Performance

Right-click the link icon ( ) to the left of any row in the **Weekly Transactions for CICS System** table to view the available links, or left-click on the link to take the default link for that table.

Use the back button in the toolbar to return to the **CICS Transactions** workspace.

Weekly CICS transaction history workspace

The **Weekly CICS Transaction History** workspace is linked from the **Weekly Transactions for CICS System** workspace. This workspace displays the weekly

transaction history for a given Transaction ID, CICS System ID, MVS System ID and Period Name. The values for these attributes are passed from the row in the **Weekly Transactions for CICS System** table in the **Weekly Transactions for CICS System** workspace via the **Weekly CICS Transaction History** link to this workspace. This workspace displays data provided by the CICS Transactions attribute group (see "CICS Transactions attributes" on page 52).

This predefined workspace contains the following views:

- The **Weekly Transaction Details** table displays the weekly transaction history for a given Transaction ID, CICS System ID, MVS™ System ID and Period Name.
- The **Weekly CPU Usage for Transaction** bar chart displays the Average CPU Time for each week for a given Transaction ID, CICS System ID, MVS System ID and Period Name.

Use the back button in the toolbar to return to the **Weekly Transactions for CICS System** workspace.

Weekly CICS Transaction Performance workspace

The **Weekly CICS Transaction Performance** workspace is linked from the **Weekly Transactions for CICS System** workspace. This workspace displays weekly performance statistics for a given Transaction ID, CICS System ID, MVS System ID and Period Name. The values for these attributes are passed from the row in the **Weekly Transactions for CICS System** table in the **Weekly Transactions for CICS System** workspace via the **Weekly CICS Transaction History** link to this workspace. This workspace displays data provided by the CICS Transactions attribute group (see "CICS Transactions attributes" on page 52).

This predefined workspace contains the following views.

- The **Weekly Response Times for Transaction** bar chart displays the Average Task Response Time, Maximum Task Response Time, and Minimum Task Response Time for each week for a given Transaction ID, CICS System ID, MVS System ID and Period Name.
- The **Weekly CPU Times for Transaction** bar chart displays the Average CPU Time, Maximum CPU Time and Minimum CPU Time for each week for a given Transaction ID, CICS System ID, MVS System ID and Period Name.
- The **Weekly Transaction Count for Transaction** bar chart displays the Transaction Count for each week for a given Transaction ID, CICS System ID, MVS System ID and Period Name.
- The **Weekly Request Counts for Transaction** bar chart displays the number of DB2 Requests, File Control Requests, and IMS Requests for each week for a given Transaction ID, CICS System ID, MVS System ID and Period Name.

Use the back button in the toolbar to return to the **Weekly Transactions for CICS System** workspace.

Daily Transactions for CICS System workspace

The **Daily Transactions for CICS System** workspace is identical to the **Weekly Transactions for CICS System** workspace, however it represents a single day's summary of CICS transaction data rather than one week's summary of data. See "Weekly transactions for CICS system workspace" on page 17 for more information on this workspace.

Daily CICS Transaction History workspace

The **Daily CICS Transaction History** workspace is identical to the Weekly **CICS Transaction History** workspace, however it represents a single day's summary of CICS transaction data rather than one week's summary of data. See "Weekly CICS transaction history workspace" on page 17 for more information on this workspace.

Daily CICS Transaction Performance workspace

The **Daily CICS Transaction Performance** workspace is identical to the Weekly **CICS Transaction Performance** workspace, however it represents a single day's summary of CICS transaction data rather than one week's summary of data. See "Weekly CICS Transaction Performance workspace" on page 18 for more information on this workspace.

Hourly Transactions for CICS System workspace

The **Hourly Transactions for CICS System** workspace is identical to the **Weekly Transactions for CICS System** workspace, however it represents a single hour of a day's summary of CICS transaction data rather than one week's summary of data. See "Weekly transactions for CICS system workspace" on page 17 for more information on this workspace.

Hourly CICS Transaction History workspace

The **Hourly CICS Transaction History** workspace is identical to the Weekly **CICS Transaction History** workspace, however it represents a single hour of a day's summary of CICS transaction data rather than one week's summary of data. See "Weekly CICS transaction history workspace" on page 17 for more information on this workspace.

Hourly CICS Transaction Performance workspace

The **Hourly CICS Transaction Performance** workspace is identical to the Weekly **CICS Transaction Performance** workspace, however it represents a single hour of a day's summary of CICS transaction data rather than one week's summary of data. See "Weekly CICS Transaction Performance workspace" on page 18 for more information on this workspace.

Predefined workspaces for DB2 transactions

Following is a summary of all the predefined workspaces for the **DB2 Transactions** attribute group.

DB2 Transactions workspace

The **DB2 Transactions** workspace is the top-level workspace for viewing DB2 transaction information from the Tivoli Decision Support for z/OS DB2 tables. This workspace displays data provided by the DB2 Transactions attribute group (see "DB2 Transactions attributes" on page 53).

This predefined workspace contains the following views:

- The **Weekly Summary** table displays a list of unique DB2 System ID and Date attributes which have DB2 correlation data available in the weekly DB2 Transactions table.

- The **Daily Summary** table displays a list of unique DB2 System ID and Date attributes which have DB2 correlation data available in the daily DB2 Transaction table.
- The **Total DB2 Thread Completions by DB2 System for Latest Day** bar chart shows the total number of successful and unsuccessful DB2 thread completions for each DB2 System ID for the most recent day's data from the daily DB2 Transactions table

From the **Weekly Summary** and **Daily Summary** tables you can link directly to one of the following workspaces to display all the DB2 correlations which ran for the selected DB2 System ID and Date:

- Weekly DB2 System Summary
- Daily DB2 System Summary

Right-click the link icon ( ) to the left of any row in the above tables to view the available links, or left-click on the link to take the default link for that table.

Weekly DB2 System Summary workspace

The **Weekly DB2 System Summary** workspace is linked from the **DB2 Transactions** workspace. This workspace displays details of all the DB2 correlations which ran for the given DB2 System ID for the week starting from the given Date. The DB2 System ID and Date attribute values are passed from the row in the **Weekly Summary** table in the **DB2 Transactions Workspace** via the **Weekly DB2 System Summary** link to this workspace. This workspace displays data provided by the DB2 Transactions attribute group (see "DB2 Transactions attributes" on page 53).

This predefined workspace contains the following views:

- The **Weekly DB2 System Summary** table displays a summary of all the DB2 correlations which ran for the given DB2 System ID for the week starting from the given Date.
- The **Total DB2 Thread Completions by Week** bar chart shows the total number of successful and unsuccessful DB2 thread completions for each week for the given DB2 System ID.

From the **Weekly DB2 System Summary** table you can link directly to one of the following workspaces to display more detailed information on a particular Correlation ID:

- Weekly DB2 Correlation History
- Weekly DB2 Correlation Performance

Right-click the link icon ( ) to the left of any row in the **Weekly Transactions for CICS System** table to view the available links, or left-click on the link to take the default link for that table.

Use the back button in the toolbar to return to the **DB2 Transactions** workspace.

Weekly DB2 Correlation History

The **Weekly DB2 Correlation History** workspace is linked from the **Weekly DB2 System Summary** workspace. This workspace displays the weekly DB2 correlation history for a given Correlation ID, DB2 System ID, DB2 Plan Name, and Period Name. The values for these attributes are passed from the row in the **Weekly DB2 System Summary** table in the **Weekly DB2 System Summary** workspace via the

Weekly DB2 Correlation History link to this workspace. This workspace displays data provided by the DB2 Transactions attribute group (see "DB2 Transactions attributes" on page 53).

This predefined workspace contains the following views:

- The **Weekly DB2 Correlation History** table displays the weekly DB2 correlation history for the given Correlation ID, DB2 System ID, DB2 Plan Name, and Period Name.
- The **Weekly DB2 Thread Completions for Correlation ID** bar chart displays the successful and unsuccessful DB2 thread completions for each week for the given Correlation ID, DB2 System ID, DB2 Plan Name, and Period Name.

Use the back button in the toolbar to return to the **Weekly DB2 System Summary** workspace.

Weekly DB2 Correlation Performance

The **Weekly DB2 Correlation Performance** workspace is linked from the **Weekly DB2 System Summary** workspace. This workspace displays weekly performance statistics for a given Correlation ID, DB2 System ID, DB2 Plan Name, and Period Name. The values for these attributes are passed from the row in the **Weekly DB2 System Summary** table in the **Weekly DB2 System Summary** workspace via the **Weekly DB2 Correlation Performance** link to this workspace. This workspace displays data provided by the DB2 Transactions attribute group (see "DB2 Transactions attributes" on page 53).

This predefined workspace contains the following views:

- The **Weekly DB2 Thread Completions for Correlation ID** bar chart displays the successful and unsuccessful DB2 thread completions for each week for the given Correlation ID, DB2 System ID, DB2 Plan Name, and Period Name.
- The **Weekly TCB Statistics for Correlation ID** bar chart displays the total CPU TCB time and accumulated DB2 TCB time for each week for the given Correlation ID, DB2 System ID, DB2 Plan Name, and Period Name.
- The **Weekly Abort and Commit Statistics for Correlation ID** bar chart displays the total abort and commit count for each week for the given Correlation ID, DB2 System ID, DB2 Plan Name, and Period Name.

Use the back button in the toolbar to return to the **Weekly DB2 System Summary** workspace.

Daily DB2 System Summary

The **Daily DB2 System Summary** workspace is identical to the **Weekly DB2 System Summary** workspace, however it represents a single day's summary of DB2 correlation data rather than one week's summary of data. See "Weekly DB2 System Summary workspace" on page 20 for more information on this workspace.

Daily DB2 Correlation History

The **Daily DB2 Correlation History** workspace is identical to the **Weekly DB2 Correlation History** workspace, however it represents a single day's summary of DB2 correlation data rather than one week's summary of data. See "Weekly DB2 Correlation History" on page 20 for more information on this workspace.

Daily DB2 Correlation Performance

The **Daily DB2 Correlation Performance** workspace is identical to the **Weekly DB2 Correlation Performance** workspace, though it represents a single day's summary of DB2 correlation data rather than one week's summary of data. See "Weekly DB2 Correlation Performance" on page 21 for more information on this workspace.

Predefined workspaces for Device Statistics

Following is a summary of all the predefined workspaces for the **Device Statistics** attribute group.

Device Statistics

The **Device Statistics** workspace is the top-level workspace for viewing device statistics from the Tivoli Decision Support for z/OS DB2 tables. This workspace displays data provided by the Device Statistics attribute group (see "Device Statistics attributes" on page 55).

This predefined workspace contains the following views:

- The **Hourly Summary** table displays a list of unique MVS System ID, Date, and Time attributes which have device statistics available in the hourly Device Statistics table.
- The **Busiest Devices by Users Waiting for Latest Hour** bar chart shows the worst performing devices based on the average number of users waiting for the device, for the latest hourly data in the Device Statistics table.

From the **Hourly Summary** table you can link directly to one of the following workspaces to display device statistics for the selected MVS System ID, Date, and Time:

- Hourly Device Summary for System
- Hourly Device Performance for System

Right-click the link icon ( ) to the left of any row in the above tables to view the available links, or left-click on the link to take the default link for that table.

Hourly Device Summary for System

The **Hourly Device Summary for System** workspace is linked from the **Device Statistics** workspace. This workspace displays statistics for all the devices for the given MVS System ID on the hour specified by the given Date and Time. The MVS System ID, Date, and Time attribute values are passed from the row in the **Hourly Summary** table in the **Device Statistics Workspace** via the **Hourly Device Summary for System** link to this workspace. This workspace displays data provided by the Device Statistics attribute group (see "Device Statistics attributes" on page 55).

This predefined workspace contains the following views:

- The **Hourly Device Summary for System** table displays a summary of all the devices for the given MVS System ID on the hour specified by the given Date and Time.
- The **Busiest Devices by Users Waiting for System** bar chart shows the busiest devices based on those with the highest number of users waiting for the given MVS System ID on the hour specified by the given Date and Time.

From the **Hourly Device Summary for System** table you can link directly to one of the following workspaces to display more detailed history on a particular device or system:

- Hourly Device Summary for Device
- Hourly Device Performance for System
- Hourly Device Performance for Device

Right-click the link icon ( ) to the left of any row in the **Weekly Transactions for CICS System** table to view the available links, or left-click on the link to take the default link for that table.

Use the back button in the toolbar to return to the **Device Statistics** workspace.

Hourly Device Summary for Device

The **Hourly Device Summary for Device** workspace is linked from the **Hourly Device Summary for System** workspace. This workspace displays the history for a device by displaying the statistics for all hours on every day for the given Volume Serial Number and MVS System ID. The Volume Serial Number and MVS System ID attribute values are passed from the row in the **Hourly Device Summary for System** table in the **Hourly Device Summary for System** Workspace via the **Hourly Device Summary for Device** link to this workspace. This workspace displays data provided by the Device Statistics attribute group (see "Device Statistics attributes" on page 55).

This predefined workspace contains the following views:

- The **Hourly Device Summary for Device** table displays the history for a device by displaying the statistics for all hours on every day for the given Volume Serial Number and MVS System ID.
- The **Average Users Waiting for Device** bar chart shows the DASD mpl for every hour on the given Date, for the given Volume Serial Number and MVS System ID.

Use the back button in the toolbar to return to the Hourly Device Summary for System workspace.

Hourly Device Performance for System

The **Hourly Device Performance for System** workspace is linked from either the **Hourly Device Summary for System** workspace or the **Device Statistics** workspace. This workspace displays the poorest performing or busiest devices based on requests serviced per second, average response time per request, DASD mpl, and device busy percentage for the given Date, Time (hour), on the given system (MVS System ID). The MVS System ID, Date, and Time attribute values are passed via the **Hourly Device Performance for System** link from the row in either the **Hourly Summary** table in the **Device Statistics** workspace, or the **Hourly Device Summary for System** table in the **Hourly Device Summary for System w**orkspace.This workspace displays data provided by the Device Statistics attribute group (see "Device Statistics attributes" on page 55).

This predefined workspace contains the following views:

- The **Busiest Devices by IO Rate** bar chart displays the busiest devices based on those with the highest number of requests serviced per second, for the given MVS System ID, Date, and Time.

- The **Worst Performing Devices by Response** Time bar chart displays the busiest devices based on those with the highest average response time per request, for the given MVS System ID, Date, and Time.
- The **Busiest Devices by DASD mpl** bar chart displays the busiest devices based on those with the highest number of users waiting, for the given MVS System ID, Date, and Time.
- The **Busiest Devices by Percentage** bar chart displays the busiest devices based on those with the highest device busy percentage, for the given MVS System ID, Date, and Time.

Use the back button in the toolbar to return to either the Device Statistics workspace or the Hourly Device Summary for System workspace.

Hourly Device Performance for Device

The **Hourly Device Performance for Device** workspace is linked from the **Hourly Device Summary for System** workspace. This workspace displays the performance of the device based on requests serviced per second, average response time per request, DASD mpl, and device busy percentage for all the hours on the given date and system (MVS System ID). The MVS System ID and Date attribute values are passed via the **Hourly Device Performance for Device** link from the row in the **Hourly Summary for System** table in the **Hourly Device Summary for System w**orkspace.This workspace displays data provided by the Device Statistics attribute group (see "Device Statistics attributes" on page 55).

This predefined workspace contains the following views:

- The **Hourly IO Rate** bar chart displays the hourly performance for the given device (Volume Serial Number) based on the Requests Serviced per Second attribute, for the given MVS System ID and Date.
- The **Hourly Response Time** bar chart displays the hourly performance for the given device (Volume Serial Number) based on the Average Response Time per Request attribute, for the given MVS System ID and Date.
- The **Hourly Users Waiting** bar chart displays the hourly performance for the given device (Volume Serial Number) based on the DASD mpl attribute, for the given MVS System ID and Date.
- The **Hourly Device Busy Percentage** bar chart displays the hourly performance for the given device (Volume Serial Number) based on the Device Busy Percentage attribute, for the given MVS System ID and Date.

Use the back button in the toolbar to return to the Hourly Device Summary for System workspace.

Predefined workspaces for IMS Transactions

Following is a summary of all the predefined workspaces for the **IMS Transactions** attribute group.

IMS Transactions workspace

The **IMS Transactions** workspace is the top-level workspace for viewing IMS Transaction information from the Tivoli Decision Support for z/OS DB2 tables. This workspace displays data provided by the IMS Transactions attribute group (see "IMS Transactions attributes" on page 59).

This predefined workspace contains the following views:

- The **Weekly Summary** table displays a list of unique IMS subsystems (Process IMS) and Date attributes which have IMS transaction data available in the weekly IMS Transactions table.
- The **Daily Summary** table displays a list of unique IMS subsystems (Process IMS) and Date attributes which have IMS transaction data available in the daily IMS Transactions table.
- The **Hourly Summary** table displays a list of unique IMS subsystems (Process IMS), Date, and Time attributes which have IMS transaction data available in the hourly IMS Transactions table.
- The **Daily Transaction Count for all IMS Subsystems** bar chart shows the total IMS transaction count for each day for all IMS Subsystems from the daily IMS Transactions table.

From the **Weekly Summary, Daily Summary, and Hourly Summary** tables you can link directly to one of the following workspaces to display all the IMS transactions which ran for either all IMS subsystems or for the selected individual IMS subsystem on the particular Date, and Time (in the case of the Hourly Summary):
- Weekly IMS Transactions for IMS Subsystem
- Weekly IMS Transactions for all IMS Subsystems
- Daily IMS Transactions for IMS Subsystem
- Daily IMS Transactions for all IMS Subsystems
- Hourly IMS Transactions for IMS Subsystem
- Hourly IMS Transactions for all IMS Subsystems

Right-click the link icon ( ) to the left of any row in the above tables to view the available links, or left-click on the link to take the default link for that table.

Weekly IMS Transactions for IMS Subsystem workspace

The **Weekly IMS Transactions for IMS Subsystem** workspace is linked from the IMS**Transactions** workspace. This workspace displays details of all the IMS transactions which ran for the given IMS subsystem for the week starting from the given Date. The IMS subsystem ID (Process ID) and Date attribute values are passed from the row in the **Weekly Summary** table in the IMS **Transactions Workspace** via the **Weekly IMS Transactions for IMS Subsystem** link to this workspace. This workspace displays data provided by the IMS Transactions attribute group (see “IMS Transactions attributes” on page 59).

This predefined workspace contains the following views:
- The **Weekly IMS Transactions for IMS Subsystem** table displays a summary of all the IMS transactions which ran for the given IMS Process ID for the week starting from the given date.
- The **Weekly IMS Transaction Count for IMS Subsystem** bar chart shows the total IMS transaction count for each week for the given IMS subsystem.

From the **Weekly IMS Transactions for IMS Subsystem** table you can link directly to one of the following workspaces to display more detailed information on a particular Transaction ID:
- Weekly IMS Transaction Summary for Subsystem
- Weekly IMS Transaction Performance for Subsystem

Right-click the link icon ( ) to the left of any row in the **Weekly IMS Transactions for IMS Subsystem** table to view the available links, or left-click on the link to take the default link for that table.

Use the back button in the toolbar to return to the **IMS Transactions** workspace.

Weekly IMS Transaction Summary for Subsystem workspace

The **Weekly IMS Transaction Summary for Subsystem** workspace is linked from the **Weekly IMS Transactions for IMS Subsystem** workspace. This workspace displays details on all weeks of transaction data for the given IMS transaction name, transaction type, program name and IMS subsystem. The Transaction Name, Process IMS, Transaction Type and Program Name attribute values are passed from the row in the **Weekly IMS Transactions for IMS Subsystem** table in the **Weekly IMS Transactions for IMS Subsystem** workspace via the **Weekly IMS Transaction Summary for Subsystem** link to this workspace. This workspace displays data provided by the IMS Transactions attribute group (see "IMS Transactions attributes" on page 59).

This predefined workspace contains the following views:

- The **Weekly IMS Transaction History** table displays all weeks of transaction data for the given IMS transaction name, transaction type, program name and IMS subsystem.
- The **Weekly IMS Elapsed Time for Transaction** bar chart shows the total elapsed time (Process Seconds) for each week of transaction data for the given IMS transaction name, transaction type, program name and IMS subsystem.

Use the back button in the toolbar to return to the Weekly IMS Transactions for IMS Subsystem workspace.

Weekly IMS Transaction Performance for Subsystem workspace

The **Weekly IMS Transaction Performance for Subsystem** workspace is linked from the **Weekly IMS Transactions for IMS Subsystem** workspace. This workspace displays weekly performance statistics such as the programs elapsed time, the transaction count and the transactions elapsed time details for the given IMS transaction name, transaction type, program name and IMS subsystem. The Transaction Name, Process IMS, Transaction Type and Program Name attribute values are passed from the row in the **Weekly IMS Transactions for IMS Subsystem** table in the **Weekly IMS Transactions for IMS Subsystem** workspace via the **Weekly IMS Transaction Performance for Subsystem** link to this workspace. This workspace displays data provided by the IMS Transactions attribute group (see "IMS Transactions attributes" on page 59).

This predefined workspace contains the following views:

- The **Weekly CPU Seconds for Transaction** bar chart shows the total program CPU seconds for each week of transaction data for the given IMS transaction name, transaction type, program name and IMS subsystem.
- The **Weekly Transaction Count for Transaction** bar chart shows the total IMS transaction count for each week of transaction data for the given IMS transaction name, transaction type, program name and IMS subsystem.
- The **Weekly Elapsed Time for Transaction** bar chart shows the total process seconds, input seconds, and output seconds for each week of transaction data for the given IMS transaction name, transaction type, program name, and IMS subsystem.

Use the back button in the toolbar to return to the **Weekly IMS Transactions for IMS Subsystem workspace**.

Weekly IMS Transactions for all IMS Subsystems

The **Weekly IMS Transactions for all IMS Subsystems** workspace is identical to the **Weekly IMS Transactions for IMS Subsystem** workspace though it represents transaction data from all IMS subsystems rather than for a given IMS subsystem (Process ID). See "Weekly IMS Transactions for IMS Subsystem workspace" on page 25 for more information on this workspace.

Weekly IMS Transaction Summary for all Systems

The **Weekly IMS Transaction Summary for all Systems** workspace is identical to the **Weekly IMS Transaction Summary for Subsystem** workspace though it represents transaction data from all IMS subsystems rather than for a given IMS subsystem (Process ID). See "Weekly IMS Transactions for all IMS Subsystems" for more information on this workspace.

Weekly IMS Transaction Performance for all Systems

The **Weekly IMS Transaction Performance for all Systems** workspace is identical to the **Weekly IMS Transaction Performance for Subsystem** workspace though it represents transaction data from all IMS subsystems rather than for a given IMS subsystem (Process ID). See "Weekly IMS Transactions for all IMS Subsystems" for more information on this workspace.

Daily IMS Transactions for IMS Subsystem workspace

The **Daily IMS Transactions for IMS Subsystem** workspace is identical to the **Weekly IMS Transactions for IMS Subsystem** workspace though it represents a single day's summary of IMS transaction data rather than one week's summary of data. See "Weekly IMS Transactions for IMS Subsystem workspace" on page 25 for more information on this workspace.

Daily IMS Transaction Summary for Subsystem workspace

The **Daily IMS Transaction Summary for Subsystem** workspace is identical to the **Weekly IMS Transaction Summary for Subsystem** workspace though it represents a single day's summary of IMS transaction data rather than one week's summary of data. See "Weekly IMS Transaction Summary for Subsystem workspace" on page 26 for more information on this workspace.

Daily IMS Transaction Performance for Subsystem workspace

The **Daily IMS Transaction Performance for Subsystem** workspace is identical to the **Weekly IMS Transaction Performance for Subsystem** workspace though it represents a single day's summary of IMS transaction data rather than one week's summary of data. See "Weekly IMS Transaction Performance for Subsystem workspace" on page 26 for more information on this workspace.

Daily IMS Transactions for all IMS Subsystems

The **Daily IMS Transactions for all IMS Subsystems** workspace is identical to the **Daily IMS Transactions for IMS Subsystem** workspace though it represents transaction data from all IMS subsystems rather than for a given IMS subsystem (Process ID). See "Daily IMS Transactions for IMS Subsystem workspace" for more information on this workspace.

Daily IMS Transaction Summary for all Systems

The **Daily IMS Transaction Summary for all Systems** workspace is identical to the **Daily IMS Transaction Summary for Subsystem** workspace though it represents

transaction data from all IMS subsystems rather than for a given IMS subsystem (Process ID). See “Daily IMS Transaction Summary for Subsystem workspace” on page 27 for more information on this workspace.

Daily IMS Transaction Performance for all Systems

The **Daily IMS Transaction Performance for all Systems** workspace is identical to the **Daily IMS Transaction Performance for Subsystem** workspace though it represents transaction data from all IMS subsystems rather than for a given IMS subsystem (Process ID). See “Daily IMS Transaction Performance for Subsystem workspace” on page 27 for more information on this workspace.

Hourly IMS Transactions for IMS Subsystem workspace

The **Hourly IMS Transactions for IMS Subsystem** workspace is identical to the **Weekly IMS Transactions for IMS Subsystem** workspace though it represents a single hour's summary of IMS transaction data rather than one week's summary of data. See “Weekly IMS Transactions for IMS Subsystem workspace” on page 25 for more information on this workspace.

Hourly IMS Transaction Summary for Subsystem workspace

The **Hourly IMS Transaction Summary for Subsystem** workspace is identical to the **Weekly IMS Transaction Summary for Subsystem** workspace though it represents a single hour's summary of IMS transaction data rather than one week's summary of data. See “Weekly IMS Transaction Summary for Subsystem workspace” on page 26 for more information on this workspace.

Hourly IMS Transaction Performance for Subsystem workspace

The **Hourly IMS Transaction Performance for Subsystem** workspace is identical to the **Weekly IMS Transaction Performance for Subsystem** workspace though it represents a single hour's summary of IMS transaction data rather than one week's summary of data. See “Weekly IMS Transaction Performance for Subsystem workspace” on page 26 for more information on this workspace.

Hourly IMS Transactions for all IMS Subsystems

The **Hourly IMS Transactions for all IMS Subsystems** workspace is identical to the **Hourly IMS Transactions for IMS Subsystem** workspace though it represents transaction data from all IMS subsystems rather than for a given IMS subsystem (Process ID). See “Hourly IMS Transactions for IMS Subsystem workspace” for more information on this workspace.

Hourly IMS Transaction Summary for all Systems

The **Hourly IMS Transaction Summary for all Systems** workspace is identical to the **Hourly IMS Transaction Summary for Subsystem** workspace though it represents transaction data from all IMS subsystems rather than for a given IMS subsystem (Process ID). See “Hourly IMS Transaction Summary for Subsystem workspace” for more information on this workspace.

Hourly IMS Transaction Performance for all Systems

The **Hourly IMS Transaction Performance for all Systems** workspace is identical to the **Hourly IMS Transaction Performance for Subsystem** workspace though it represents transaction data from all IMS subsystems rather than for a given IMS

subsystem (Process ID). See "Hourly IMS Transaction Performance for Subsystem workspace" on page 28 for more information on this workspace.

Predefined workspaces for Interval Job Step Accounting

Following is a summary of all the predefined workspaces for the **Interval Job Step Accounting** attribute group.

Interval Job Step Accounting workspace

The **Interval Job Step Accounting** workspace is the top-level workspace for viewing accounting statistics on address spaces and jobs from the Tivoli Decision Support for z/OS DB2 tables. This workspace displays data provided by the Interval Job Step Accounting attribute group (see "Interval Job Step Accounting attributes" on page 61).

This predefined workspace contains the following views:

- The **Monthly Summary** table displays a list of unique MVS System ID and Date attributes which have accounting statistics on address spaces and jobs available in the monthly Interval Job Step Accounting table.
- The **Daily Summary** table displays a list of unique MVS System ID and Date attributes which have accounting statistics on address spaces and jobs available in the daily Interval Job Step Accounting table.
- The **Hourly Summary** table displays a list of unique MVS System ID, Date, and Time attributes which have accounting statistics on address spaces and jobs available in the hourly Interval Job Step Accounting table.
- The **Total Job Count per System for Latest Day** bar chart shows the total number of jobs run for each unique MVS system from the most recent daily job data contained within the daily Interval Job Step Accounting table.

From the **Monthly Summary**, **Daily Summary,** and **Hourly Summary** tables you can link directly to one of the following workspaces to display all the address spaces and jobs for the selected MVS System ID and Date, and Time (in the case of the Hourly Summary):

- Monthly Job Summary for System
- Daily Job Summary for System
- Hourly Job Summary for System

Right-click the link icon ( ) to the left of any row in the above tables to view the available links, or left-click on the link to take the default link for that table.

Monthly Job Summary for System

The **Monthly Job Summary for System** workspace is linked from the **Interval Job Step Accounting** workspace. This workspace displays accounting statistics on address spaces and jobs for the given MVS System ID for the month starting from the given date. The MVS System ID and Date attribute values are passed from the row in the **Monthly Summary** table in the **Interval Job Step Accounting Workspace** via the **Monthly Job Summary for System** link to this workspace. This workspace displays data provided by the Interval Job Step Accounting attribute group (see "Interval Job Step Accounting attributes" on page 61).

This predefined workspace contains the following views:

- The **Monthly Job Summary for System** table displays accounting statistics on address spaces and jobs for the given MVS System ID for the month starting from the given Date.

- The **Total Monthly CPU for all Jobs on System** bar chart shows the sum of all CPU total seconds for every address space and job for each month on the given MVS System ID.

From the **Monthly Job Summary for System** table you can link directly to the following workspace to display more detailed information on a particular job name:

- Monthly Job Summary for Job

Right-click the link icon ( ) to the left of any row in the **Monthly Job Summary for MVS System** table to view the available links, or left-click on the link to take the default link for that table.

Use the back button in the toolbar to return to the **Interval Job Step Accounting** workspace.

Monthly Job Summary for Job

The **Monthly Job Summary for Job** workspace is linked from the **Monthly Job Summary for System** workspace. This workspace displays accounting statistics for every month for the given Job Name, MVS System ID and Period Name. The Job Name, MVS System ID and Period Name attribute values are passed from the row in the **Monthly Job Summary for System** table in the **Monthly Job Summary for System** via the **Monthly Job Summary for Job** link to this workspace. This workspace displays data provided by the Interval Job Step Accounting attribute group (see “Interval Job Step Accounting attributes” on page 61).

This predefined workspace contains the following views:

- The **Monthly Job Summary for Job Name** table displays accounting statistics for every month for the given Job Name, MVS System ID and Period Name.
- The **Monthly CPU Usage for Job Name** bar chart graphs the CPU Total Seconds for every month for the given Job Name, MVS System ID and Period Name.
- The **Monthly Blocks Transferred for Job Name** bar chart graphs the Blocks Transferred for every month for the given Job Name, MVS System ID and Period Name.

Use the back button in the toolbar to return to the **Monthly Job Summary for System** workspace.

Daily Job Summary for System

The **Daily Job Summary for System** workspace is identical to the **Monthly Job Summary for System** workspace though it represents a single day's summary of accounting statistics on address spaces and job data rather than one month's summary of data. See “Monthly Job Summary for System” on page 29 for more information on this workspace.

Daily Job Summary for Job

The **Daily Job Summary for Job** workspace is identical to the **Monthly Job Summary for Job** workspace though it represents accounting statistics summarized by day for the given job name rather than being summarized by month. See “Monthly Job Summary for Job” for more information on this workspace.

Hourly Job Summary for System

The **Hourly Job Summary for System** workspace is identical to the **Monthly Job Summary for System** workspace though it represents a single hour of a day's summary of accounting statistics on address spaces and job data rather than one month's summary of data. See "Monthly Job Summary for System" on page 29 for more information on this workspace.

Hourly Job Summary for Job

The **Hourly Job Summary for Job** workspace is identical to the **Monthly Job Summary for Job** workspace though it represents accounting statistics summarized by hour for the given job name rather than being summarized by month. See "Monthly Job Summary for Job" on page 30 for more information on this workspace.

Predefined workspaces for Logical Partition Statistics

Following is a summary of all the predefined workspaces for the **Logical Partition Statistics** attribute group.

Logical Partition Statistics workspace

The **Logical Partition Statistics** workspace is the top-level workspace for viewing statistics on logical partitions and processor activity in a PR/SM™ environment from the Tivoli Decision Support for z/OS DB2 tables. This workspace displays data provided by the Logical Partition Statistics attribute group (see "Logical Partition Statistics attributes" on page 62).

This predefined workspace contains the following views:

- The **Monthly Summary** table displays a list of unique LPAR Names and Date attributes which have logical partition and processor activity statistics available in the monthly Logical Partition Statistics table.
- The **Daily Summary** table displays a list of unique LPAR Names and Date attributes which have logical partition and processor activity statistics available in the daily Logical Partition Statistics table.
- The **Hourly Summary** table displays a list of unique LPAR Names, Date, and Time attributes which have logical partition and processor activity statistics available in the hourly Logical Partition Statistics table.
- The **Latest Daily LPAR Averages** bar chart shows the average LPAR busy percentage, average LPROC busy percentage, and the average total processor complex utilization percentage for each unique LPAR from the most recent daily logical partition data contained within the daily Logical Partition Statistics table.

From the **Monthly Summary**, **Daily Summary,** and**Hourly Summary** tables you can link directly to one of the following workspaces to display logical partition statistics for the selected LPAR Name, Date, and Time (in the case of the Hourly Summary):

- Monthly Statistics for LPAR
- Daily Statistics for LPAR
- Hourly Statistics for LPAR

Right-click the link icon () to the left of any row in the above tables to view the available links, or left-click on the link to take the default link for that table.

Monthly Statistics for LPAR workspace

The **Monthly Statistics for LPAR** workspace is linked from the **Logical Partition Statistics** workspace. This workspace displays logical partition and processor activity statistics for the given LPAR name for the month starting from the given Date. The LPAR Name and Date attribute values are passed from the row in the **Monthly Summary** table in the **Logical Partition Statistics** Workspace via the **Monthly Statistics for LPAR** link to this workspace. This workspace displays data provided by the Logical Partition Statistics attribute group (see "Logical Partition Statistics attributes" on page 62).

This predefined workspace contains the following views:

- The **Monthly Statistics for LPAR** table displays logical partition and processor activity statistics for the given LPAR name for the month starting from the given date.
- The **Monthly LPAR Averages for LPAR** bar chart shows the average LPAR busy percentage, average LPROC busy percentage, and the average total processor complex utilization percentage for all processors for each month for the given LPAR Name.

From the **Monthly Statistics for LPAR** table you can link directly to the following workspace to display more historical information by month for the selected LPAR Name and Processor Type:

- Monthly Processor Activity for LPAR

Right-click the link icon ( ) to the left of any row in the **Monthly Statistics for LPAR** table to view the available links, or left-click on the link to take the default link for that table.

Use the back button in the toolbar to return to the **Logical Partition Statistics** workspace.

Monthly Processor Activity for LPAR workspace

The **Monthly Processor Activity for LPAR** workspace is linked from the **Monthly Statistics for LPAR** workspace. This workspace displays logical partition and processor activity statistics for every month for the given LPAR Name, Processor Type, MVS System ID, and Period Name. The LPAR Name, Processor Type, MVS System ID and Period Name attribute values are passed from the row in the **Monthly Statistics for LPAR** table in the **Monthly Statistics for LPAR** Workspace via the **Monthly Processor Activity for LPAR** link to this workspace. This workspace displays data provided by the Logical Partition Statistics attribute group (see "Logical Partition Statistics attributes" on page 62).

This predefined workspace contains the following views:

- The **Monthly Statistics for LPAR and Processor Type** table displays logical partition and processor activity statistics for every month for the given LPAR Name, Processor Type, MVS System ID, and Period Name.
- The **Monthly Statistics for LPAR and Processor** Type bar chart graphs the LPAR busy percentage, LPROC busy percentage, and the total processor complex utilization percentage for every month for the given LPAR Name, Processor Type, MVS System ID, and Period Name.

Use the back button in the toolbar to return to the **Monthly Statistics for LPAR** workspace.

Daily Statistics for LPAR workspace

The **Daily Statistics for LPAR** workspace is identical to the **Monthly Statistics for LPAR** workspace though it represents a single day's summary of logical partition and processor activity statistics rather than one month's summary of data. See "Monthly Statistics for LPAR workspace" on page 32 for more information on this workspace.

Daily Processor Activity for LPAR workspace

The **Daily Processor Activity for LPAR** workspace is identical to the **Monthly Processor Activity for LPAR** workspace though it represents logical partition and processor activity statistics summarized by every day for the given LPAR Name, Processor Type, MVS System ID, and Period Name rather than for every month. See "Monthly Processor Activity for LPAR workspace" on page 32 for more information on this workspace.

Hourly Statistics for LPAR workspace

The **Hourly Statistics for LPAR** workspace is identical to the **Monthly Statistics for LPAR** workspace though it represents a single hour of a day's summary of logical partition and processor activity statistics rather than one month's summary of data. See "Monthly Processor Activity for LPAR workspace" on page 32 for more information on this workspace.

Hourly Processor Activity for LPAR workspace

The **Hourly Processor Activity for LPAR** workspace is identical to the **Monthly Processor Activity for LPAR** workspace though it represents logical partition and processor activity statistics summarized by hour for the given LPAR Name, Processor Type, MVS System ID, and Period Name rather than for every month. See "Monthly Processor Activity for LPAR workspace" on page 32 for more information on this workspace.

Predefined workspaces for System Statistics

Following is a summary of all the predefined workspaces for the **System Statistics** attribute group.

System Statistics workspace

The **System Statistics** workspace is the top-level workspace for viewing statistics on various system activities, such as processor, paging, and swapping activities, from the Tivoli Decision Support for z/OS DB2 tables. This workspace displays data provided by the System Statistics attribute group (see "System Statistics attributes" on page 63).

This predefined workspace contains the following views:

- The **Monthly Summary** table displays a list of unique MVS System ID attributes which have system statistics available in the monthly System Statistics table.
- The **Daily Summary** table displays a list of unique MVS System ID attributes which have system statistics available in the daily System Statistics table.
- The **Hourly Summary** table displays a list of unique MVS System ID and Date attributes which have system statistics available in the hourly System Statistics table.

- The **Latest Days Average CPU Ranges for all Systems** bar chart shows for each unique MVS System ID the maximum and minimum processor load for all periods for the most recent day's system data available from the daily System Statistics table.

From the **Monthly Summary**, **Daily Summary,** and **Hourly Summary** tables you can link directly to one of the following workspaces to display system statistics such as processor, paging, and swapping activities for the selected MVS System ID and Date (in the case of the Hourly Summary):

- Monthly System Statistics for System
- Daily System Statistics for System
- Hourly System Statistics for System

Right-click the link icon ( ) to the left of any row in the above tables to view the available links, or left-click on the link to take the default link for that table.

Monthly System Statistics for System workspace

The **Monthly System Statistics for System** workspace is linked from the **System Statistics** workspace. This workspace displays monthly statistics on various system activities, such as processor, paging, and swapping activities for the given MVS System ID. The MVS System ID attribute value is passed from the row in the **Monthly Summary** table in the System **Statistics** workspace via the **Monthly System Statistics for System** link to this workspace. This workspace displays data provided by the System Statistics attribute group (see "System Statistics attributes" on page 63).

This predefined workspace contains the following views:

- The **Monthly System Statistics for System** table displays system statistics for all periods in every month for the given MVS System ID.
- The **Monthly Processor Load for System for all Periods** bar chart displays for each month the maximum and minimum processor load for all periods for the given MVS System ID.

Use the back button in the toolbar to return to the **System Statistics** workspace.

Daily System Statistics for System workspace

The **Daily System Statistics for System** workspace is identical to the **Monthly System Statistics for System** workspace though it summarizes daily system statistics for a given MVS System ID rather than monthly. See "Monthly System Statistics for System workspace" for more information on this workspace.

Hourly System Statistics for System workspace

The **Hourly System Statistics for System** workspace is identical to the **Monthly System Statistics for System** workspace though it summarizes hourly system statistics for a given MVS System ID rather than monthly. See "Monthly System Statistics for System workspace" for more information on this workspace.

Predefined workspaces for DFSMS Volume Information

Following is a summary of all the predefined workspaces for the **DFSMS™ Volume Information** attribute group.

DFSMS Volume Information workspace

The **DFSMS Volume Information** workspace is the top-level workspace for viewing daily and monthly statistics on DASD volumes from the Tivoli Decision Support for z/OS DB2 tables. These workspaces can be used for trending of overall utilization of DASD space. This workspace displays data provided by the DFSMS Volume Information attribute group (see "DFSMS Volume Information attributes" on page 57).

This predefined workspace contains the following views:

- The **Monthly Summary** table displays a list of unique Storage Groups, MVS System ID's and Dates which have DASD volume information available in the monthly DFSMS Volume Information table.
- The **Daily Summary** table displays a list of unique Storage Groups, MVS System ID's and Dates which have DASD volume information available in the daily DFSMS Volume Information table.
- The **Latest Days Average Space Usage for all Systems** bar chart displays for each unique MVS System ID the average total amount of free and allocated space in megabytes for all volumes from the most recent day's data available in the daily DFSMS Volume Information table.

From the **Monthly Summary** and **Daily Summary** tables you can link directly to one of the following workspaces to display statistics on all the DASD volumes for the selected Storage Group, MVS System ID and Date:

- Monthly DFSMS Storage Group Summary
- Daily DFSMS Storage Group Summary

Right-click the link icon ( ) to the left of any row in the above tables to view the available links, or left-click on the link to take the default link for that table.

Monthly DFSMS Storage Group Summary workspace

The **Monthly DFSMS Storage Group Summary** workspace is linked from the **DFSMS Volume Information** workspace. This workspace displays statistics on all the DASD volumes for the given Storage Group and MVS System ID summarized for the month starting from the given Date. The Storage Group, MVS System ID and Date attribute values are passed from the row in the **Monthly Summary** table in the **DFSMS Volume Information** workspace via the **Monthly DFSMS Storage Group Summary** link to this workspace. This workspace displays data provided by the DFSMS Volume Information attribute group (see "DFSMS Volume Information attributes" on page 57).

This predefined workspace contains the following views.

- The **Monthly DFSMS Storage Group Summary** table displays statistics on all the DASD volumes for the given Storage Group and MVS System ID summarized for the month starting from the given Date.
- The **Average Monthly Space Usage for all Volumes** bar chart displays for all months the average free and allocated space in megabytes for all volumes within the given Storage Group and MVS System ID.

From the **Monthly DFSMS Storage Group Summary** table, you can link directly to the **Monthly DFSMS Volume Summary** workspace to display more historical trending information by month for the selected volume (Volume Serial Number) within the Storage Group and MVS System ID.

Right-click the link icon ( ) to the left of any row in the **Monthly DFSMS Storage Group Summary** table to view the available links, or left-click on the link to take the default link for that table.

Use the back button in the toolbar to return to the **DFSMS Volume Information** workspace.

Monthly DFSMS Volume Summary workspace

The **Monthly DFSMS Volume Summary** workspace is linked from the **Monthly DFSMS Storage Group Summary** workspace. This workspace displays historical DASD volume information for every month for the given volume (Volume Serial Number), Storage Group and MVS System ID. This can be used to see monthly trends in overall utilization of DASD space for the particular volume. The Volume Serial Number, Storage Group and MVS System ID attribute values are passed from the row in the **Monthly DFSMS Storage Group Summary**workspace via the **Monthly DFSMS Volume Summary** link to this workspace. This workspace displays data provided by the DFSMS Volume Information attribute group (see "DFSMS Volume Information attributes" on page 57).

This predefined workspace contains the following views:

- The **Monthly DFSMS Volume Information** table displays historical DASD volume information for every month for the given volume (Volume Serial Number), Storage Group and MVS System ID.
- The **Monthly Space Allocation for Volume** bar chart displays the average allocated space and average free space for every month for the given volume (Volume Serial Number), Storage Group and MVS System ID.

Use the back button in the toolbar to return to the **Monthly DFSMS Storage Group Summary** workspace.

Daily DFSMS Storage Group Summary workspace

The **Daily DFSMS Storage Group Summary** workspace is identical to the **Monthly DFSMS Storage Group Summary** workspace though it represents a single day's summary of DASD volume information rather than one month's summary of data. See "Monthly DFSMS Storage Group Summary workspace" on page 35 for more information on this workspace.

Daily DFSMS Volume Summary workspace

The **Daily DFSMS Volume Summary** workspace is identical to the **Monthly DFSMS Volume Summary** workspace though it represents a single day's summary of DASD volume information rather than one month's summary of data. See "Monthly DFSMS Storage Group Summary workspace" on page 35 for more information on this workspace.

Predefined workspaces for Coupling Facility Statistics

Following is a summary of all the predefined workspaces for the **Coupling Facility Statistics** attribute group.

Coupling Facility Statistics workspace

The **Coupling Facility Statistics** workspace is the top- level workspace for viewing hourly statistics on the Coupling Facility from the Tivoli Decision Support for z/OS DB2 tables. These workspaces can be used for trending of activity such as

response time and request rates on structures within the coupling facility. This workspace displays data provided by the Coupling Facility Statistics attribute group (see "Coupling Facility Statistics attributes" on page 66).

This predefined workspace contains the following views:

- The **Hourly Summary by Structure Type** table displays a list of unique Sysplex Names, Date and Structure Type attributes which have Coupling Facility statistics available in the hourly Coupling Facility Statistics table.
- The **Hourly Summary by Sysplex** table displays a list of unique Sysplex Names, Date and Time attributes which have Coupling Facility statistics available in the hourly Coupling Facility Statistics table.
- The **Total Requests per Sysplex for Latest Day** bar chart shows for each unique Sysplex Name, the average request rate per second and average synchronous/asynchronous requests per second for the most recent days coupling facility data available from the Coupling Facility Statistics table.

From the **Hourly Summary by Structure Type** and **Hourly Summary by Sysplex** tables you can link directly to one of the following workspaces to display coupling facility statistics such a request rates and throughput for the selected Sysplex Name and Date or Sysplex Name, Structure Type and Time:
- Hourly CF Structure Details for Type
- Hourly CF Structure Details for Sysplex

Right-click the link icon ( ) to the left of any row in the above tables to view the available links, or left-click on the link to take the default link for that table.

Hourly CF Structure Details for Type workspace

The **Hourly CF Structure for Type** workspace is linked to from the **Coupling Facility Statistics** workspace. This workspace displays all the coupling facility structure details for the given Structure Type, on the given Sysplex Name and Date. The Structure Type, Sysplex Name and Date attribute values are passed from the row in the **Hourly Summary by Structure Type** table in the **Coupling Facility Statistics** workspace via the **Hourly CF Structure Details for Type** link to this workspace. This workspace displays data provided by the Coupling Facility Statistics attribute group (see "Coupling Facility Statistics attributes" on page 66).

This predefined workspace contains the following views:

- The **Hourly Structure Details for Structure Type** table displays a summary of all the coupling facility Structure Names and associated statistics for the given Structure Type, Sysplex Name and Date.
- The **Total Requests per Structure for Type** bar chart shows for each unique Structure Name, the average request rate per second and average synchronous/asynchronous requests per second for the given Structure Type, Sysplex Name and Date.

From the **Hourly Structure Details for Structure Type** table you can link directly to one of the following workspaces to display more detailed information on a particular Structure Name:
- Hourly CF Structure History for System
- Hourly CF Structure Performance for System

Right-click the link icon ( ) to the left of any row in the above tables to view the available links, or left-click on the link to take the default link for that table.

Use the back button in the toolbar to return to the **Coupling Facility Statistics** workspace.

Hourly CF Structure History for System

The **Hourly CF Structure History for System** workspace is linked to from the **Hourly CF Structure Details for Type** or **Hourly CF Structure Details for Sysplex** workspace. This workspace displays all the coupling facility history for the given Structure Name, Sysplex Name, MVS System ID and CF Name. The values for these attributes are passed from the table row in the **Hourly CF Structure Details for Type** or **Hourly CF Structure Details for Sysplex** workspace via their associated workspace links to this workspace. This workspace displays data provided by the Coupling Facility Statistics attribute group (see "Coupling Facility Statistics attributes" on page 66).

This predefined workspace contains the following views:

- The **Hourly Structure Details for Structure Type** table displays a summary of all the coupling facility Structure Names and associated statistics for the given Structure Type, Sysplex Name and Date.
- The **Total Requests per Structure for Type** bar chart shows for each unique Structure Name, the average request rate per second and average synchronous/asynchronous requests per second for the given Structure Type, Sysplex Name and Date.

Use the back button in the toolbar to return to the **Hourly CF Structure Details for Type** or **Hourly CF Structure Details for Sysplex** workspace.

Hourly CF Structure Performance for System

The **Hourly CF Structure Performance for System** workspace is linked to from the **Hourly CF Structure Details for Type** or **Hourly CF Structure Details for Sysplex** workspace. This workspace displays coupling facility performance statistics per hour for the given Structure Name, Sysplex Name, MVS System ID, CF Name and Date. The values for these attributes are passed from the table row in the **Hourly CF Structure Details for Type** or **Hourly CF Structure Details for Sysplex** workspace via their associated workspace links to this workspace. This workspace displays data provided by the Coupling Facility Statistics attribute group (see "Coupling Facility Statistics attributes" on page 66).

This predefined workspace contains the following views:

- The **Hourly Requests for Structure Name** bar chart displays the request rate per second and synchronous/asynchronous requests per second for every hour on the given Date, for the given Structure Name, Sysplex Name, MVS System ID and CF Name.
- The **Hourly Request Times for Structure Name** bar chart displays the average time for synchronous and asynchronous requests for every hour on the given Date, for the given Structure Name, Sysplex Name, MVS System ID and CF Name.
- The **Hourly Activity for Structure Name** bar chart displays the changed operations per second, path busy rejections per second, subchannel busy rejections per second and subchannel busy delays per second for every hour on the given Date, for the given Structure Name, Sysplex Name, MVS System ID and CF Name.

Use the back button in the toolbar to return to the **Hourly CF Structure Details for Type** or **Hourly CF Structure Details for Type** workspace.

Hourly CF Structure Details for Sysplex workspace

The **Hourly CF Structure Details for Sysplex** workspace is linked to from the Coupling Facility Statistics workspace. This workspace displays all the coupling facility structure details for the given Sysplex Name on the given Date and Time. The values for these attributes are passed from the row in the **Hourly Summary by Sysplex** table in the **Coupling Facility Statistics** workspace via the **Hourly CF Structure Details for Sysplex** link to this workspace. This workspace displays data provided by the Coupling Facility Statistics attribute group (see "Coupling Facility Statistics attributes" on page 66).

This predefined workspace contains the following views:

- The **Hourly Structure Details for Sysplex** table displays a summary of all the coupling facility Structure Names and associated statistics for the given Sysplex Name on the given Date and Time.
- The **Total Requests per Structure for Sysplex** bar chart shows for each unique Structure Name, the average request rate per second and average synchronous/asynchronous requests per second for the given Sysplex Name, Date and Time.

From the **Hourly Structure Details for Sysplex** table you can link directly to one of the following workspaces to display more detailed information on a particular Structure Name:

- Hourly CF Structure History for System
- Hourly CF Structure Performance for System

Right-click the link icon ( ) to the left of any row in the above tables to view the available links, or left-click on the link to take the default link for that table.

Use the back button in the toolbar to return to the Coupling Facility Statistics workspace.

Predefined workspaces for TCPIP Server Connections

Following is a summary of all the predefined workspaces for the **TCPIP Server Connections** attribute group.

TCPIP Server Connections workspace

The **TCPIP Server Connections** workspace is the top-level workspace for viewing hourly, daily and weekly statistics for TCPIP server connections from the Tivoli Decision Support for z/OS DB2 tables. These workspaces can be used for trending of TCPIP activity such as inbound and outbound traffic by IP address and port. This workspace displays data provided by the TCPIP Server Connections attribute group (see "TCPIP Server Connections attributes" on page 68).

This predefined workspace contains the following views:

- The **Weekly Summary** table displays a list of unique MVS System ID and Date attributes which have connection data available in the weekly TCPIP Server Connections table.
- The **Daily Summary** table displays a list of unique MVS System ID and Date attributes which have connection data available in the daily TCPIP Server Connections table.
- The **Hourly Summary** table displays a list of unique MVS System ID, Date, and Time attributes which have connection data available in the hourly TCPIP Server Connections table.

- The **Total kb Transferred per System for Latest Available Day** bar chart shows for each unique MVS System ID, the total inbound and outbound TCPIP server connection traffic for the most recent days TCPIP server connection data available from the daily TCPIP Server Connection table.

From the **Weekly Summary**, **Daily Summary**, and **Hourly Summary** tables you can link directly to one of the following workspaces to display all the TCPIP server connections for the selected MVS System ID, Date and Time (in the case of the Hourly Summary):

- Weekly Connection Activity for System
- Daily Connection Activity for System
- Hourly Connection Activity for System

Right-click the link icon ( ) to the left of any row in the above tables to view the available links, or left-click on the link to take the default link for that table.

Weekly Connection Activity for System workspace

The **Weekly Connection Activity for System** workspace is linked to from the **TCPIP Server Connections** workspace. This workspace displays all the TCPIP server connection details for the given MVS System ID on the week starting from the given Date. The MVS System ID and Date attribute values are passed from the row in the **Weekly Summary** table in the **TCPIP Server Connections** workspace via the **Weekly Connection Activity for System** link to this workspace. This workspace displays data provided by the TCPIP Server Connections attribute group (see "TCPIP Server Connections attributes" on page 68).

This predefined workspace contains the following views:

- The **Weekly Connection Summary for System** table displays a summary of all the TCPIP server connection statistics by IP address and port for the given MVS System ID and week starting from the given Date.
- The **Weekly Connection Activity by IP Address** bar chart shows for each unique IP address the total inbound and outbound kilobytes for the given MVS System ID and week starting from the given Date.

From the **Weekly Connection Summary for System** table you can link directly to one of the following workspaces to display more detailed information on a particular IP Address and Port:

- Weekly Connection Activity for Port
- Weekly Connection Performance for Port
- Weekly Most Active Ports

Right-click the link icon ( ) to the left of any row in the above tables to view the available links, or left-click on the link to take the default link for that table.

Use the back button in the toolbar to return to the **TCPIP Server Connections** workspace.

Weekly Connection Activity for Port

The **Weekly Connection Activity for Port** workspace is linked to from the **Weekly Connection Activity for System** workspace. This workspace displays all the TCPIP server connection history for the given MVS System ID, Sysplex Name, IP Address and Port on the week starting from the given Date. It is useful for seeing trending information such as inbound/outbound traffic on a weekly basis for the specific IP Address and Port. The given attribute values are passed from the row in the

Weekly Connection Summary for System table and workspace via the **Weekly Connection Activity for System** link to this workspace. This workspace displays data provided by the TCPIP Server Connections attribute group (see "TCPIP Server Connections attributes" on page 68).

This predefined workspace contains the following views:

- The **Weekly Connection History for IP Address and Port** table displays the history of all the TCPIP server connection statistics on a weekly basis for the given MVS System ID, Sysplex Name, IP Address and Port.
- The **Weekly Connection Activity for IP Address and Port** bar chart shows the weekly trend of inbound and outbound traffic in kilobytes for the given MVS System ID, Sysplex Name, IP Address and Port.

Use the back button in the toolbar to return to the **Weekly Connection Activity for System** workspace.

Weekly Connection Performance for Port

The **Weekly Connection Performance for Port** workspace is linked to from the **Weekly Connection Activity for System** workspace. This workspace displays inbound and outbound traffic, the number of connections and retransmissions, and the average connection times for the given MVS System ID, Sysplex Name, IP Address and Port. It is useful for seeing trending information on TCPIP server connection activity. The given attribute values are passed from the row in the **Weekly Connection Summary for System** table and workspace via the **Weekly Connection Performance for Port** link to this workspace. This workspace displays data provided by the TCPIP Server Connections attribute group (see "TCPIP Server Connections attributes" on page 68).

This predefined workspace contains the following views:

- The **Weekly Connection Activity for IP Address and Port** bar chart shows the weekly trend of inbound and outbound traffic in kilobytes for the given MVS System ID, Sysplex Name, IP Address and Port.
- The **Weekly Connection Statistics for IP Address and Port** bar chart shows the weekly trend of the number of connections and retransmissions for the given MVS System ID, Sysplex Name, IP Address and Port.
- The **Weekly Connection Times for IP Address and Port** bar chart shows the weekly trend of the average connection duration and average round trip time for the given MVS System ID, Sysplex Name, IP Address and Port.

Use the back button in the toolbar to return to the **Weekly Connection Activity for System** workspace.

Weekly Most Active Ports

The **Weekly Most Active Ports** workspace is linked to from the **Weekly Connection Activity for System** workspace. This workspace displays the ports which are most active in terms of inbound and outbound traffic and connections, for the week starting from the given date and for the given IP address and MVS System ID. The given attribute values are passed from the row in the **Weekly Connection Summary for System** table and workspace via the **Weekly Most Active Ports** link to this workspace. This workspace displays data provided by the TCPIP Server Connections attribute group (see "TCPIP Server Connections attributes" on page 68).

This predefined workspace contains the following views:

- The **Weekly Most Active Connections for IP Address** bar chart shows the ports which had the highest number of connections over the weekly period, for the given MVS System ID, IP Address and week starting from the given Date.
- The **Weekly Most Inbound Activity for IP Address** bar chart shows the ports which had the highest inbound traffic (in kilobytes) over the weekly period, for the given MVS System ID, IP Address and week starting from the given Date.
- **The Weekly Most Outbound Activity for IP Address** bar chart shows the ports which had the highest outbound traffic (in kilobytes) over the weekly period, for the given MVS System ID, IP Address and week starting from the given Date.

Use the back button in the toolbar to return to the **Weekly Connection Activity for System** workspace.

Daily Connection Activity for System workspace

The **Daily Connection Activity for System** workspace is identical to the **Weekly Connection Activity for System** workspace, however it represents a single day's summary of TCPIP server connection data rather than one week's summary of data. See "Weekly Connection Activity for System workspace" on page 40 for more information on this workspace.

Daily Connection Activity for Port workspace

The **Daily Connection Activity for Port** workspace is identical to the **Weekly Connection Activity for Port** workspace, however it represents a single day's summary of TCPIP server connection data rather than one week's summary of data. See "Weekly Connection Activity for Port" on page 40 for more information on this workspace.

Daily Connection Performance for Port workspace

The **Daily Connection Performance for Port** workspace is identical to the **Weekly Connection Performance for Port** workspace, however it represents a single day's summary of TCPIP server connection data rather than one week's summary of data. See "Weekly Connection Performance for Port" on page 41 for more information on this workspace.

Daily Most Active Ports workspace

The **Daily Most Active Ports** workspace is identical to the Weekly Most Active Ports workspace, however it represents a single day's summary of TCPIP server connection data rather than one week's summary of data. See "Weekly Most Active Ports" on page 41 for more information on this workspace.

Hourly Connection Activity for System

The **Hourly Connection Activity for System** workspace is identical to the **Weekly Connection Activity for System** workspace, however it represents a single hour of a day's summary of TCPIP server connection data rather than one week's summary of data. See "Daily Connection Activity for System workspace" for more information on this workspace.

Hourly Connection Activity for Port

The **Hourly Connection Activity for Port** workspace is identical to the **Weekly Connection Activity for Port** workspace, however it represents a single hour of a

day's summary of TCPIP server connection data rather than one week's summary of data. See "Weekly Connection Activity for Port" on page 40 for more information on this workspace.

Hourly Connection Performance for Port

The **Hourly Connection Performance for Port** workspace is identical to the **Weekly Connection Performance for Port** workspace, however it represents a single hour of a day's summary of TCPIP server connection data rather than one week's summary of data. See "Weekly Connection Performance for Port" on page 41 for more information on this workspace.

Hourly Most Active Ports

The **Hourly Most Active Ports** workspace is identical to the **Weekly Most Active Ports** workspace, however it represents a single hour of a day's summary of TCPIP server connection data rather than one week's summary of data. See "Weekly Most Active Ports" on page 41 for more information on this workspace.

Predefined workspaces for Workload Statistics

Following is a summary of all the predefined workspaces for the **Workload Statistics** attribute group.

Workload Statistics workspace

The **Workload Statistics** workspace is the top-level workspace for viewing hourly, daily and monthly statistics on the workload manager from the Tivoli Decision Support for z/OS DB2 tables. These workspaces can be used for trending of activity such as CPU and IO counts from within the workload manager. This workspace displays data provided by the Workload Statistics attribute group (see "Workload Statistics attributes" on page 68).

This predefined workspace contains the following views:

- The **Hourly Summary** table displays a list of unique MVS System ID, Date and Time attributes which have workload statistics available in the hourly Workload Statistics table
- The **Daily Summary** table displays a list of unique MVS System ID and Date attributes which have workload statistics available in the daily Workload Statistics table.
- The **Monthly Summary** table displays a list of unique MVS System ID and Date attributes which have workload statistics available in the monthly Workload Statistics table.

From the **Hourly Summary**, **Daily Summary** and **Monthly Summary** tables you can link directly to one of the following workspaces to display workload statistics for the selected MVS System ID, Date and Time (in the case of the Hourly Summary):

- Hourly Workload Summary for System
- Daily Workload Summary for System
- Monthly Workload Summary for System

Right-click the link icon ( ) to the left of any row in the above tables to view the available links, or left-click on the link to take the default link for that table.

Monthly Workload Summary for System workspace

The **Monthly Workload Summary for System** workspace is linked to from the **Workload Statistics** workspace. This workspace displays a summary of all the workload manager statistics for the given MVS System ID on the month starting from the given Date. The MVS System ID and Date attribute values are passed from the row in the **Monthly Summary** table in the **Workload Statistic**s workspace via the **Monthly Workload Summary for System** link to this workspace. This workspace displays data provided by the Workload Statistics attribute group (see "Workload Statistics attributes" on page 68).

This predefined workspace contains the following views:

- The **Monthly Workload Summary for System** table displays a summary of all the workload manager statistics by service class, period and policy for the given MVS System ID and month starting from the given Date.
- The **CPU Usage per Service Class for System** bar chart shows for each unique service class the total SRB and TCB seconds for the given MVS System ID and month starting from the given Date.

From the **Monthly Workload Summary for System** table you can link directly to one of the following workspaces to display more detailed information on a particular service class, period, and policy:

- Monthly Workload History for Service Class
- Monthly Workload Performance for Service Class

Right-click the link icon ( ) to the left of any row in the above tables to view the available links, or left-click on the link to take the default link for that table.

Use the back button in the toolbar to return to the **Workload Statistics** workspace.

Monthly Workload History for Service Class workspace

The **Monthly Workload History for Service Class** workspace is linked to from the **Monthly Workload Summary for System** workspace. This workspace displays all the workload manager history for the given Service Class, Service Class Period, Service Policy, MVS System ID, Sysplex Name, Period, Workload Type and Workload Group. It is useful for seeing trending information such as CPU usage on a monthly basis for the given attributes. The given attribute values are passed from the row in the **Monthly Workload Summary for System** table and workspace via the **Monthly Workload History for Service Class** link to this workspace. This workspace displays data provided by the Workload Statistics attribute group (see "Workload Statistics attributes" on page 68).

This predefined workspace contains the following views:

- The **Monthly Workload History for Service Class** table displays the history of all the workload manager statistics on a monthly basis for the Service Class, Service Class Period, Service Policy, MVS System ID, Sysplex Name, Period, Workload Type and Workload Group.
- The **Monthly CPU Usage for Service Class** bar chart shows the monthly trend of SRB and TCB Seconds for the given Service Class, Service Class Period, Service Policy, MVS System ID, Sysplex Name, Period, Workload Type and Workload Group.

Use the back button in the toolbar to return to the **Monthly Workload Summary for System** workspace.

Monthly Workload Performance for Service Class workspace

The **Monthly Workload Performance for Service Class** workspace is linked to from the **Monthly Workload Summary for System** workspace. This workspace displays workload manager performance statistics such as CPU usage and IO and transaction counts for the given Service Class, Service Class Period, Service Policy, MVS System ID, Sysplex Name, Period, Workload Type and Workload Group. It is useful for seeing trending information on a monthly basis for the given attributes. The given attribute values are passed from the row in the **Monthly Workload Summary for System** table and workspace via the **Monthly Workload Performance for Service Class** link to this workspace. This workspace displays data provided by the Workload Statistics attribute group (see "Workload Statistics attributes" on page 68).

This predefined workspace contains the following views:

- The **Monthly CPU Usage for Service Class** bar chart shows the monthly trend of SRB and TCB Seconds for the given Service Class, Service Class Period, Service Policy, MVS System ID, Sysplex Name, Period, Workload Type and Workload Group.
- The **Monthly IO Count for Service Class** bar chart shows the monthly IO Count trend for the given Service Class, Service Class Period, Service Policy, MVS System ID, Sysplex Name, Period, Workload Type and Workload Group.
- The **Monthly Transactions Ended for Service Class** bar chart shows the monthly trend of number of Transactions Ended and number of Transactions Ended Within Goal for the given Service Class, Service Class Period, Service Policy, MVS System ID, Sysplex Name, Period, Workload Type and Workload Group.

Use the back button in the toolbar to return to the **Monthly Workload Summary for System** workspace.

Daily Workload Summary for System workspace

The **Daily Workload Summary for System** workspace is identical to the **Monthly Workload Summary for System** workspace, however it represents a single days summary of workload manager statistics rather than one months summary of data. See "Monthly Workload Summary for System workspace" on page 44 for more information on this workspace.

Daily Workload History for Service Class workspace

The **Daily Workload History for Service Class** workspace is identical to the **Monthly Workload History for Service Class** workspace, however it represents a single days summary of workload manager statistics rather than one months summary of data. See "Monthly Workload History for Service Class workspace" on page 44 for more information on this workspace.

Daily Workload Performance for Service Class workspace

The **Daily Workload Performance for Service Class** workspace is identical to the **Monthly Workload Performance for Service Class** workspace, however it represents a single days summary of workload manager statistics rather than one months summary of data. See "Monthly Workload Performance for Service Class workspace" for more information on this workspace.

Hourly Workload Summary for System workspace

The **Hourly Workload Summary for System** workspace is identical to the **Monthly Workload Summary for System** workspace, however it represents a single hour of a days summary of workload manager statistics rather than one months summary of data. See "Monthly Workload Summary for System workspace" on page 44 for more information on this workspace.

Hourly Workload History for Service Class workspace

The **Hourly Workload History for Service Class** workspace is identical to the **Monthly Workload History for Service Class** workspace, however it represents a single hour of a days summary of workload manager statistics rather than one months summary of data. See "Monthly Workload History for Service Class workspace" on page 44 for more information on this workspace.

Hourly Workload Performance for Service Class workspace

The **Hourly Workload Performance for Service Class** workspace is identical to the **Monthly Workload Performance for Service Class** workspace, however it represents a single hour of a days summary of workload manager statistics rather than one months summary of data. See "Monthly Workload Performance for Service Class workspace" on page 45 for more information on this workspace.

Predefined workspaces for zLinux Statistics

Following is a summary of all the predefined workspaces for the **zLinux Statistics** attribute group.

zLinux Statistics workspace

The **zLinux Statistics** workspace is the top-level workspace for viewing hourly, daily and monthly statistics for zLinux systems from the Tivoli Decision Support for z/OS DB2 tables. These workspaces can be used for trending of activity such as CPU, memory, and processes usage for each zLinux system. This workspace displays data provided by the zLinux Statistics attribute group (see "zLinux Statistics attributes" on page 71).

This predefined workspace contains the following views:

- The **Hourly Summary** table displays a list of unique System Name, Date and Time attributes which have zLinux statistics available in the hourly zLinux Statistics table.
- The **Daily Summary** table displays a list of unique System Name and Date attributes which have zLinux statistics available in the daily zLinux Statistics table.
- The **Monthly Summary** table displays a list of unique System Name and Date attributes which have zLinux statistics available in the monthly zLinux Statistics table.

From the **Hourly Summary**, **Daily Summary** and **Monthly Summary** tables you can link directly to one of the following workspaces to display zLinux statistics for the selected System Name, Date and Time (in the case of the Hourly Summary):

- Hourly Node Summary for System
- Hourly Performance for System
- Daily Node Summary for System
- Daily Performance for System
- Monthly Node Summary for System

- Monthly Performance for System

Right-click the link icon ( ) to the left of any row in the above tables to view the available links, or left-click on the link to take the default link for that table.

Monthly Node Summary for System workspace

The **Monthly Node Summary for System** workspace is linked to from the **zLinux Statistics** workspace. This workspace displays a summary of all the zLinux nodes and their statistics for the given System Name for the month starting from the given Date. The System Name and Date attribute values are passed from the row in the **Monthly Summary table in the zLinux Statistics** workspace via the **Monthly Node Summary for System** link to this workspace. This workspace displays data provided by the zLinux Statistics attribute group ("zLinux Statistics attributes" on page 71).

This predefined workspace contains the following views:

- The **Monthly Node Summary for System** table displays a summary of all the zLinux statistics by node name for the given System Name and month starting from the given Date.
- The M**onthly CPU Usage by Node for System** bar chart shows for each unique node name the Average CPU Usage, Maximum CPU Usage and Minimum CPU Usage in percent for the given System Name and month starting from the given Date.

From the **Monthly Node Summary for System** table you can link directly to one of the following workspaces to display more detailed information on a zLinux Node Name:

- Monthly History for Node
- Monthly Performance for Node

Right-click the link icon ( ) to the left of any row in the above tables to view the available links, or left-click on the link to take the default link for that table.

Use the back button in the toolbar to return to the **zLinux Statistics** workspace.

Monthly History for Node workspace

The **Monthly History for Node** workspace is linked to from the **Monthly Node Summary for System** workspace. This workspace displays the zLinux historical statistics by month for the given Node Name, System Name and Period. This workspace is useful to see monthly trending on attributes such as Average CPU Usage, Average Free Memory Pages and Average Processes. The given attribute values are passed from the row in the **Monthly Node Summary for System** table and workspace via the **Monthly History for Node** link to this workspace. This workspace displays data provided by the zLinux Statistics attribute group (see "zLinux Statistics attributes" on page 71).

This predefined workspace contains the following views:

- The **Monthly History for Node** table displays a summary of all the zLinux statistics on a monthly basis for the given System Name, Node Name and Period.
- The **Monthly CPU Usage for Node** bar chart displays on a monthly basis the Average CPU Usage, Maximum CPU Usage and Minimum CPU Usage for the given System Name, Node Name and Period.

Use the back button in the toolbar to return to the **Monthly Node Summary** for System workspace.

Monthly Performance for Node workspace

The **Monthly Performance for Node** workspace is linked to from the **Monthly Node Summary for System** workspace. This workspace displays the zLinux historical statistics by month in a series of bar charts for the given Node Name, System Name and Period. This workspace is useful to see monthly trending on attributes such as Average CPU Usage, Average Free Memory Pages, Average Processes and Average Paging Rate. The given attribute values are passed from the row in the **Monthly Node Summary for System** table and workspace via the **Monthly Performance for Node** link to this workspace. This workspace displays data provided by the zLinux Statistics attribute group (see "zLinux Statistics attributes" on page 71).

This predefined workspace contains the following views:

- The **Monthly CPU Usage for Node** bar chart displays on a monthly basis the Average CPU Usage, Maximum CPU Usage and Minimum CPU Usage for the given System Name, Node Name and Period.
- The **Monthly Processes for Node** bar chart displays on a monthly basis the Average Processes, Maximum Processes and Minimum Processes for the given System Name, Node Name and Period.
- The **Monthly Free Memory for Node** bar chart displays on a monthly basis the Average Free Memory Pages, Maximum Free Memory Pages and Minimum Free Memory Pages for the given System Name, Node Name and Period.
- The **Monthly Paging for Node** bar chart displays on a monthly basis the Average Paging Rate, Maximum Paging Rate and Minimum Paging Rate for the given System Name, Node Name and Period.

Use the back button in the toolbar to return to the **Monthly Node Summary for System** workspace.

Monthly Performance for System workspace

The **Monthly Performance for System** workspace is linked to from the **zLinux Statistics** workspace. This workspace displays the performance of each node name in areas such as CPU usage, processes, free memory pages and paging rates, for the given zLinux System Name on the month starting from the given Date. The System Name and Date attribute values are passed from the row in the **Monthly Summary** table in the **zLinux Statistics** workspace via the **Monthly Performance for System** link to this workspace. This workspace displays data provided by the zLinux Statistics attribute group (see "zLinux Statistics attributes" on page 71).

This predefined workspace contains the following views:

- The **Monthly CPU Usage for System** bar chart displays the Average CPU Usage, Maximum CPU Usage and Minimum CPU Usage for each individual node name for the given zLinux System Name on the month starting from the given Date.
- The **Monthly Processes for System** bar chart displays the Average Processes, Maximum Processes and Minimum Processes for each individual node name for the given zLinux System Name on the month starting from the given Date.
- The **Monthly Free Memory for System** bar chart displays on a monthly basis the Average Free Memory Pages, Maximum Free Memory Pages and Minimum Free Memory Pages for each individual node name for the given zLinux System Name on the month starting from the given Date.

- The **Monthly Paging for System** bar chart displays on a monthly basis the Average Paging Rate, Maximum Paging Rate and Minimum Paging Rate for each individual node name for the given zLinux System Name on the month starting from the given Date.

Use the back button in the toolbar to return to the **zLinux Statistics** workspace.

Daily Node Summary for System workspace

The **Daily Node Summary for System** workspace is identical to the **Monthly Node Summary for System** workspace, however it represents a single days summary of zLinux statistics rather than one months summary of data. See "Monthly Node Summary for System workspace" on page 47 for more information on this workspace.

Daily History for Node workspace

The **Daily History for Node** workspace is identical to the **Monthly History for Node** workspace, however it represents a single days summary of zLinux statistics rather than one months summary of data. See "Monthly History for Node workspace" on page 47 for more information on this workspace.

Daily Performance for Node workspace

The **Daily Performance for Node** workspace is identical to the **Monthly Performance for Node** workspace, however it represents a single days summary of zLinux statistics rather than one months summary of data. See "Monthly Performance for Node workspace" on page 48 for more information on this workspace.

Daily Performance for System workspace

The **Daily Performance for System** workspace is identical to the **Monthly Performance for System** workspace, however it represents a single days summary of zLinux statistics rather than one months summary of data. See "Monthly Performance for System workspace" on page 48 for more information on this workspace.

Hourly Node Summary for System workspace

The **Hourly Node Summary for System** workspace is identical to the **Monthly Node Summary for System** workspace, however it represents a single hour of a days summary of zLinux statistics rather than one months summary of data. See "Daily Node Summary for System workspace" for more information on this workspace.

Hourly History for Node workspace

The **Hourly History for Node** workspace is identical to the **Monthly History for Node** workspace, however it represents a single hour of a days summary of zLinux statistics rather than one months summary of data. See "Monthly History for Node workspace" on page 47 for more information on this workspace.

Hourly Performance for Node workspace

The **Hourly Performance for Node** workspace is identical to the **Monthly Performance for Node** workspace, however it represents a single hour of a days

summary of zLinux statistics rather than one months summary of data. See "Monthly Performance for Node workspace" on page 48 for more information on this workspace.

Hourly Performance for System workspace

The **Hourly Performance for System** workspace is identical to the **Monthly Performance for System** workspace, however it represents a single hour of a days summary of zLinux statistics rather than one months summary of data. See "Monthly Performance for System workspace" on page 48 for more information on this workspace.

Chapter 4. Attributes

Attributes are characteristics or properties of the objects monitored by the Tivoli Decision Support for z/OS monitoring agent. Related attributes are organized into attribute groups (also called attribute tables). The attributes are used to define the queries that collect the information displayed in tables and charts in the Tivoli Decision Support for z/OS workspaces. The table view in each workspace displays data collected for a single attribute group. See Table 1 for a tabular representation of the relationships between the predefined workspaces and the attribute groups.

Attribute names

Every attribute is identified by a unique name composed of the attribute group name followed by a period and the name of the attribute item. For example, the attribute Average_Connect_Time of the Device_Statistics group stores a value representing the Average Connect Time in milliseconds for the device for the given MVS System ID and Date/Time.

Attribute groups used by the predefined workspaces

In most cases, a workspace contains graphical or tabular data reported by related attributes in an attribute group. Table 1 identifies the attribute group related to each predefined workspace provided by the Tivoli Decision Support for z/OS monitoring agent. The workspaces are listed in alphabetical order. For more information about the product workspaces, see Chapter 2, "Workspaces overview," on page 9.

Table 1. Attribute Groups and Workspaces

Workspace	Attribute Groups
CICS Transactions workspace	CICS Transactions attributes
DB2 Transactions workspace	DB2 Transactions attributes
Device Statistics workspace	Device Statistics attributes
DFSMS Volume Information workspace	DFSMS Volume Information attributes
IMS Transactions workspace	IMS Transactions attributes
Interval Job Step Accounting workspace	Interval Job Step Accounting attributes
Logical Partition Statistics workspace	Logical Partition Statistics attributes
System Statistics workspace	System Statistics attributes
Coupling Facility Statistics workspace	Coupling Facility Statistics attributes
TCPIP Statistics workspace	TCPIP Server Connections attributes
Workload Statistics workspace	Workload Statistics attributes
zLinux Statistics workspace	zLinux Statistics attributes

Attributes by attribute group

The remainder of this chapter lists the attributes (in alphabetical order by attribute group) for the Tivoli Decision Support for z/OS monitoring agent product. You can use these attributes to determine the state of the system monitored by Tivoli Decision Support for z/OS at the given date and time period. This can alert you to

potential upcoming system constraints, such as no free space on a DASD Volume. You can also use these attributes to build custom workspaces.

CICS Transactions attributes

The CICS Transactions attributes provide hourly, daily and weekly statistics on CICS transactions. They contain information from CICS performance class monitoring records from CICS/ESA® and CICS/TS (SMF 110, subtype 1) and CICS/MVS® (SMF 110, subtype 0).

Date Date when the performance records were initialized. This is normally the task start date. From START. The valid format is a character string with a maximum length of 10 bytes.

Time Hour when the performance records were initialized. From START. This column is only available in the Hourly table. The valid format is a character string with a maximum length of 8 bytes.

Period Name
Name of the period. This is the name that you define in the PERIOD_PLAN table. Use it to group time intervals according to operator shift or to separate peak and other periods. The valid format is a character string with a maximum length of 8 bytes.

MVS System ID
This is the SMF system ID. From SMFMNSID. The valid format is a character string with a maximum length of 4 bytes.

CICS System ID
CICS generic APPLID. This is the VTAM® application ID that is used when requesting a session with this CICS system. From SMFMNPRN. The valid format is a character string with a maximum length of 8 bytes.

Transaction ID
The name of the CICS Transaction. From TRAN. The valid format is a character string with a maximum length of 4 bytes.

Principal Terminal Character
Total number of characters to and from the principal terminal. This is the sum of TCCHRIN1 + TCCHROU1. The value must be an integer in the range of 0-2147483647.

Maximum CPU Time(sec)
Maximum CPU time used during one transaction, in seconds. This is the maximum of USRCPUT. The valid format is a number formatted to 3 decimal places.

Minimum CPU Time(sec)
Minimum CPU time used during one transaction, in seconds. This is the minimum of USRCPUT. The valid format is a number formatted to 3 decimal places.

Sum CPU Time(sec)
CPU time, in seconds. This is the sum of USRCPUT. The valid format is a number formatted to 3 decimal places.

Average CPU Time(sec)
Average CPU time, in seconds. The valid format is a number formatted to 3 decimal places.

DB2 Requests
Number of DB2 (EXEC SQL IFI) requests issued by the user task. From DB2REQCT. The value must be an integer in the range of 0-2147483647.

File Control Requests
Total number of file control requests. Incremented even if the request is function shipped. This is the sum of FCTOTCT. The value must be an integer in the range of 0-2147483647.

IMS Requests
Number of IMS (DBCTL) requests issued by the user task. From IMSREQCT. The value must be an integer in the range of 0-2147483647.

Maximum Task Response Time(sec)
Peak task response time, in seconds. This is the maximum of STOP - START. The valid format is a number formatted to 3 decimal places.

Minimum Task Response Time(sec)
Minimum task response time, in seconds. This is the minimum of STOP - START. The valid format is a number formatted to 3 decimal places.

Sum Task Response Time(sec)
Total response time for all tasks, in seconds. This is the sum of STOP - START. The valid format is a number formatted to 3 decimal places.

Average Task Response Time(sec)
Average response time for all tasks, in seconds. The valid format is a number formatted to 3 decimal places.

Transaction Count
Total number of performance class monitoring records with RTYPE = T indicating task termination. This is valid for CICS V3 and later. The value must be an integer in the range of 0-2147483647.

DB2 Transactions attributes

This table provides daily and weekly statistics on DB2 transactions grouped by transaction. They contain accounting and response time data based on SMF type 101 records (DB2 accounting, IFCID 0003).

Date Date when the accounting records were collected by SMF. From SM101DTE. The valid format is a character string with a maximum length of 10 bytes.

Period Name
Name of the period. This is derived using SM101DTE and SM101TME as parameters in the PERIOD function. The valid format is a character string with a maximum length of 8 bytes.

MVS System ID
MVS system ID. This is the SMF system ID. From SM101SID. The valid format is a character string with a maximum length of 4 bytes.

DB2 System ID
This is the DB2 system ID. From SM101SSI. The valid format is a character string with a maximum length of 8 bytes.

Correlation ID
Correlation ID value. From QWHCCV. The valid format is a character string with a maximum length of 12 bytes.

DB2 Plan Name
This is the Plan name. From QWHCPLAN. The valid format is a character string with a maximum length of 8 bytes.

Unsuccessful DB2 Threads
Number of DB2 threads that completed unsuccessfully. This is the count of SMF type 101 accounting records with unsuccessful completion (QWACRINV >= 20). The value must be an integer in the range of 0-2147483647.

Abort Count
Number of abort requests. This is the sum of QWACABRT. The value must be an integer in the range of 0-2147483647.

Row Trigger Activations
Number of times a row trigger was activated. New with DB2 V6. From QXROWTRG. The value must be an integer in the range of 0-2147483647.

SQL Trigger Activations
Number of times a statement trigger was activated. New with DB2 V6. From QXSTTRG. The value must be an integer in the range of 0-2147483647.

Commit Count
Number of successful commits. This is the sum of QWACCOMM. The value must be an integer in the range of 0-2147483647.

Highest CPU Time Used
Highest CPU time (in 16-microsecond timer units) used in a successful DB2 call, rather than a single SQL call. This is the maximum of QTXACHUS. The value must be an integer in the range of 0-2147483647.

Accumulated DB2 Elapsed Time
Accumulated DB2 elapsed time, in seconds. This column contains a value only if accounting class 2 is started. Calculated as the sum of QWACASC/4096000000. The value must be an integer in the range of 0-2147483647.

Total Elapsed Time
Total elapsed time (class 1) of the application, in seconds. Calculated as the sum of the time intervals from QWACBSC to QWACESC. The value must be an integer in the range of 0-2147483647.

Implicit Prepares
The number of times an implicit prepare was performed because KEEPDYNAMIC(YES) option was used and an OPEN, EXECUTE or DESCRIBE of a dynamic statement occurred but DB2 no longer had a valid copy of the prepared statement. Sum of QXSTIPRP. The value must be an integer in the range of 0-2147483647.

IO Wait Time for Database
Accumulated DB2 elapsed time, in seconds. This column contains a value only if accounting class 2 is started. Calculated as the sum of QWACASC/4096000000. The value must be an integer in the range of 0-2147483647.

IO Wait Time for Thread
Accumulated I/O elapsed wait time for I/O under this thread, in sec. Up to DB2 V5 it is the sum of QWACAWTI/4096E6. From V6 on, the sum of

(QWACAWTI+QWACAWLG)/4096E6, since V6 splits the wait for I/O into wait for log write I/O and wait for database I/O. The value must be an integer in the range of 0-2147483647.

Successful DB2 Threads
Number of DB2 threads that completed successfully. This is the count of SMF type 101 accounting records with successful completion (QWACRINV smaller or = 16). The value must be an integer in the range of 0-2147483647.

Satisfied Prepare Requests
The number of times a PREPARE request was satisfied by making a copy from the prepared statement cache. This is the sum of QXSTFND. The value must be an integer in the range of 0-2147483647.

Row Access to Index
Number of times that DB2 tried to use direct row access but used an index instead. New with DB2 V6. From QXROIIDX. The value must be an integer in the range of 0-2147483647.

Row Access to Table Space
Number of times that DB2 tried to use direct row access but used a table space scan instead. New with DB2 V6. From QXROITS. The value must be an integer in the range of 0-2147483647.

Successful Direct Row Access
Number of times that DB2 used direct row access successfully. New with DB2 V6. From QXROIMAT. The value must be an integer in the range of 0-2147483647.

Accumulated DB2 TCB Time
Accumulated DB2 TCB time, in seconds. This column contains a value only if accounting class 2 is started. Calculated as the sum of QWACAJST/4096000000. The valid format is a number formatted to 3 decimal places.

Total CPU TCB Time
Total CPU time (class 1) spent for TCB execution, in seconds. Calculated as the sum of the time intervals from QWACBJST to QWACEJST. The valid format is a number formatted to 3 decimal places.

Device Statistics attributes

This table is provided with the Tivoli Decision Support Device Statistics component. It provides statistics on the I/O activity of MVS devices. The data comes from SMF type 74, subtype 1 records.

Date Date of the mid measurement. From SMF74DAT, SMF74IST, and SMF74INT. The valid format is a character string with a maximum length of 10 bytes.

Time Time of the mid measurement. From SMF74DAT, SMF74IST, and SMF74INT. The valid format is a character string with a maximum length of 8 bytes.

Period Name
Name of the period. This is derived using fields SMF74DAT, SMF74IST, and SMF74INT from the record as parameters in the PERIOD function. The valid format is a character string with a maximum length of 8 bytes.

MVS System ID
This is the MVS system ID. From SMF74SID. The valid format is a character string with a maximum length of 4 bytes.

Device Number
This is the Device number. From MVS_ADDR in the MVSPM_DEVICE_ADDR lookup table, or from SMF74NUM if no match is found in the lookup table. The valid format is a character string with a maximum length of 4 bytes.

Volume Serial Number
This is the Volume serial number. The valid format is a character string with a maximum length of 6 bytes.

Average Connect Time
Average connect time, in milliseconds per request. Calculated as CONNECT_MSEC/MEASUREMENT_EVENTS. The valid format is a number formatted to 3 decimal places.

DASD mpl
Average number of users waiting for the device. Calculated as ((CONNECT_MSEC+DISCONN_MSEC+PENDING_MSEC) + (REQUESTS_QUEUED*CYCLE_LENGTH_MSEC)/ (TIME_RESOLUTION*60000)). The valid format is a number formatted to 3 decimal places.

Device Busy Percentage
Percentage of time the device is busy. Calculated as 100*(CONNECT_MSEC + DISCONN_MSEC)/ (TIME_RESOLUTION*60000). The valid format is a number formatted to 3 decimal places.

Average Wait Time
Average device wait time per request, in milliseconds. This is the average time that a request waited for the device. Calculated as DEVICE_BUSY_DELAY/MEASUREMENT_EVENTS. The valid format is a number formatted to 3 decimal places.

Average Disconnect Time
Average disconnect time, in milliseconds per request. Calculated as DISCONN_MSEC/MEASUREMENT_EVENTS. The valid format is a number formatted to 3 decimal places.

Requests Serviced
Number of requests serviced per second. Calculated as MEASUREMENT_EVENTS/(TIME_RESOLUTION*60). The valid format is a number formatted to 3 decimal places.

Average Pending Time
Average pending time per request, in milliseconds This is the average time that a request waited for the device or control unit. Calculated as PENDING_MSEC/MEASUREMENT_EVENTS. The valid format is a number formatted to 3 decimal places.

Average Queue Wait
Average queue wait time, in milliseconds. This is the average time spent on the queue waiting for the UCB. Calculated as (REQUESTS_QUEUED*CYCLE_LENGTH_MSEC)/ MEASUREMENT_EVENTS. The valid format is a number formatted to 3 decimal places.

Average Response Time
Average response time per request, in milliseconds. Calculated as ((CONNECT_MSEC+DISCONN_MSEC+PENDING_MSEC) + (REQUESTS_QUEUED*CYCLE_LENGTH_MSEC))/ MEASUREMENT_EVENTS. The valid format is a number formatted to 3 decimal places.

Average SIO Time
Average start SIO time spent per request, in milliseconds. Calculated as (CONNECT_MSEC+DISCONN_MSEC)/MEASUREMENT_EVENTS. The valid format is a number formatted to 3 decimal places.

DFSMS Volume Information attributes

This table provides daily and monthly statistics on DASD volumes. It contains data written by the DFSMS COLLECT facility as type V records. Use this table for trend reporting on the overall utilization of DASD space.

Date Date when DCOLLECT was run against the volume. From DCUDATE. The valid format is a character string with a maximum length of 10 bytes.

MVS System ID
This is the MVS system ID. This is the ID of the system running DCOLLECT. From DCUSYSID. The valid format is a character string with a maximum length of 4 bytes.

Storage Group
Storage group name for the volume. From DCVSTGGP or set to the character string NON-SMS. The valid format is a character string with a maximum length of 30 bytes.

Volume Serial Number
This is the Volume serial number. The valid format is a character string with a maximum length of 6 bytes.

Total Volume Capacity
Total capacity of the volume, in kilobytes. From DCVVLCAP. The value must be an integer in the range of 0-2147483647.

Free Control Blocks
Total number of free data set control blocks in the VTOC. From DCVFDSCB. The value must be an integer in the range of 0-2147483647.

Avg Free Control Blocks
Average number of free data set control blocks in the VTOC. The value must be an integer in the range of 0-2147483647.

Extent Max
Largest extent in the volume, in kilobytes. From DCVLGEXT. The value must be an integer in the range of 0-2147483647.

Free Extents
Total number of free extents in the volume. From DCVFREXT. The value must be an integer in the range of 0-2147483647.

Average Free Extents
Average number of free extents in the volume. The value must be an integer in the range of 0-2147483647.

Fragmentation Index
Fragmentation index of the volume. From DCVFRAGI. The value must be an integer in the range of 0-2147483647.

Average Fragmentation Index
Average fragmentation index of the volume. The value must be an integer in the range of 0-2147483647.

Total Alloc Space
Total amount of allocated space in the volume, in kilobytes. From DCVALLOC. The value must be an integer in the range of 0-2147483647.

Average Alloc Space
Average amount of allocated space in the volume, in kilobytes. The value must be an integer in the range of 0-2147483647.

Maximum Alloc Space
Maximum amount of allocated space in the volume, in kilobytes. This is the maximum of SPACE_ALLOC_TOTAL in the DFSMS_VOLUME_D table. The value must be an integer in the range of 0-2147483647.

Minimum Alloc Space
Minimum amount of allocated space in the volume in kilobytes. This is the minimum of SPACE_ALLOC_TOTAL in the DFSMS_VOLUME_D table. The value must be an integer in the range of 0-2147483647.

Total Free Space
Total amount of free space in the volume, in kilobytes. From DCVFRESP. The value must be an integer in the range of 0-2147483647.

Total Free Space Pct
Total amount of free space in the volume, as a percentage of the total volume capacity. From DCVPERCT. The value must be an integer in the range of 0-2147483647.

Average Free Space
Average amount of free space in the volume, in kilobytes. The value must be an integer in the range of 0-2147483647.

Average Free Space Pct
Average amount of free space in the volume, as a percentage of the total volume capacity. The value must be an integer in the range of 0-2147483647.

Maximum Free Space Pct
Maximum amount of free space in the volume, as a percentage of the total volume capacity. Calculated as the maximum of SPACE_FREE_PCT in the DFSMS_VOLUME_D table. The value must be an integer in the range of 0-2147483647.

Minimum Free Space Pct
Minimum amount of free space in the volume, as a percentage of the total volume capacity. Calculated as the minimum of SPACE_FREE_PCT in the DFSMS_VOLUME_D table. The value must be an integer in the range of 0-2147483647.

Total Free VTOC
Total number of free VTOC index records in the volume. From DCVFVIRS. The value must be an integer in the range of 0-2147483647.

Average Free VTOC
Total number of free VTOC index records in the volume. From DCVFVIRS. The value must be an integer in the range of 0-2147483647.

IMS Transactions attributes

This table contains response and resource information for message-queue-driven transactions summarized by transaction name. These tables help identify transaction utilization and subsequent elapsed time, transmission, and queuing effects on the IMS system.

Date The date the activities occurred. The valid format is a character string with a maximum length of 10 bytes.

Time The time when the activity started. This column is only available in the Hourly table. The valid format is a character string with a maximum length of 8 bytes.

Transaction Name
The name of the IMS transaction the user requested. The valid format is a character string with a maximum length of 8 bytes.

Program Name
Name of the IMS application program used to process the transaction. For full function and Fast Path activity, this column contains the program specification block (PSB) if available. For APPC activity this column contains the TPI used. The valid format is a character string with a maximum length of 8 bytes.

Transaction Type
Activity Type, containing transaction characteristics. Each character in this 8-byte column has a specific meaning. The valid format is a character string with a maximum length of 8 bytes.

Origin IMS
The IMS subsystem ID defined in the origin part of the UOW token. It identifies the activity origin. The valid format is a character string with a maximum length of 8 bytes.

Process IMS
The IMS subsystem ID defined in the processing part of the UOW token. It identifies the activity processor. The valid format is a character string with a maximum length of 8 bytes.

Aborts
The total number of Full Function and Fast Path transactions that aborted their commits. The value must be an integer in the range of 0-2147483647.

Commits
The total number of Full Function and Fast Path transactions that completed their commits. The value must be an integer in the range of 0-2147483647.

Input CSQ
The total number of input messages issued by transactions and BMP programs queued through IMS Shared Queue. The value must be an integer in the range of 0-2147483647.

Input Local
The total number of input messages issued by transactions and BMP programs, not using Shared Queue. The value must be an integer in the range of 0-2147483647.

Input Seconds
The total time, in seconds, that transactions and BMP programs spent on

the IMS input message queue, including input queue time for program-to-program switch transactions. The valid format is a number formatted to 3 decimal places.

Output CSQ
The total number of output messages issued by transactions and BMP programs queued through IMS Shared Queue. The value must be an integer in the range of 0-2147483647.

Output Local
The total number of output messages issued by transactions and BMP programs, not using Shared Queue. The value must be an integer in the range of 0-2147483647.

Output Seconds
The total time that responding transactions spent on the IMS output queue waiting for transmission to the ultimate network destination, in seconds. The valid format is a number formatted to 3 decimal places.

Output CSQ Seconds
The time between the completed output transaction put on the queue and the get from the queue for routing the output to the terminal. It is always blank for APPC/OTMA transactions. The valid format is a number formatted to 3 decimal places.

Program CPU Seconds
The total dependent region CPU TCB seconds, derived form the count of CPU timer units stored in the program termination record (record type X'07') divided by 38400(the number of time units per CPU seconds). The valid format is a number formatted to 3 decimal places.

Program Switches
Number of program to program switches, calculated when secondary transactions are processed (SECONDARY=YES). The value must be an integer in the range of 0-2147483647.

Process Seconds
The total elapsed time that transactions and BMP programs spent processing in the dependent regions, in seconds. The valid format is a number formatted to 3 decimal places.

Response Seconds
The total time, in seconds, that responding transactions spent in network transmission to the ultimate destination, as measured using SNA definite response plus host transit time. The valid format is a number formatted to 3 decimal places.

Responses
The total number of responding transactions and BMP programs that sent messages to the originating terminal. The value must be an integer in the range of 0-2147483647.

SubQueue 6 Time
The total transaction time for subqueue 6, in seconds, as stored in the DL/I GU (record type X'31') and program termination (record type X'07') records. The valid format is a number formatted to 3 decimal places.

Transaction Count
The total number of IMS transactions for the given interval and unique key combination. The value must be an integer in the range of 0-2147483647.

Transit Seconds
The total time, in seconds, transactions and BMP programs spent in the IMS system from first enqueue of the input message to first GU of the responding output message (or transaction termination), excluding the network transmission time. The valid format is a number formatted to 3 decimal places.

Interval Job Step Accounting attributes

This table provides hourly, daily and monthly accounting statistics on address spaces and jobs. They contain data from SMF type 30.

Date Date when the activity occurred. It is the date when the reader recognised the JOB card for this job. From SMF30RSD. The valid format is a character string with a maximum length of 10 bytes.

Time Time (rounded down to the nearest hour) when the activity occurred. This column is only available in the Hourly table. The valid format is a character string with a maximum length of 8 bytes.

Period Name
Name of the period. This is derived using fields SMF30SID, SMF30IDT, SMF30IST,SMF30DTE, and SMF30TME as parameters in the PERIOD function. The valid format is a character string with a maximum length of 8 bytes.

MVS System ID
This is the MVS System ID. This is the SMF system ID. From SMF30SID. The valid format is a character string with a maximum length of 4 bytes.

Job Name
Name of job. From SMF30JBN. The valid format is a character string with a maximum length of 8 bytes.

Job Sampling Date
Date in which the job is still running. The valid format is a character string with a maximum length of 10 bytes.

SubSystem ID
Name of the subsystem. From SMF30WID. The valid format is a character string with a maximum length of 4 bytes.

Blocks Transferred
Total number of blocks transferred. This is the accumulated EXCP counts. The value must be an integer in the range of 0-2147483647.

CPU Total Seconds
Total CPU time, in seconds. This is the sum of all valid CPU times. The valid format is a number formatted to 3 decimal places.

DASD Blocks
Number of blocks transferred to and from disk devices. The value must be an integer in the range of 0-2147483647.

PA GT16MB Bytes
Maximum private area size above 16 megabytes, in bytes. The value must be an integer in the range of 0-2147483647.

PA LT16MB Bytes
Maximum private area size below 16 megabytes, in bytes. The value must be an integer in the range of 0-2147483647.

PagesAuxIn
Number of pages that were paged in from auxiliary storage. The value must be an integer in the range of 0-2147483647.

PagesAuxOut
Number of pages that were paged out to auxiliary storage. The value must be an integer in the range of 0-2147483647.

Pages Swapped In
Number of pages that were paged in from auxiliary storage. The value must be an integer in the range of 0-2147483647.

Pages Swapped Out
Number of pages that were paged out to auxiliary storage. The value must be an integer in the range of 0-2147483647.

Tape Blocks
Number of blocks transferred to and from tape devices. The value must be an integer in the range of 0-2147483647.

Total Jobs
Total number of jobs which have run for the timeframe. The value must be an integer in the range of 0-2147483647.

Logical Partition Statistics attributes

This table provides statistics on logical partitions and processor activity in a PR/SM environment. It is based on the MVS_LPAR_D table, and its data comes from SMF type 70 records processed through a record procedure (DRL2S070).

Date Date of the mid measurement. From SMF70DAT, SMF70IST, and SMF70INT. The valid format is a character string with a maximum length of 10 bytes.

Time Time (rounded down as specified in the MVSPM_TIME_RES lookup table) of the mid measurement. From SMF70DAT, SMF70IST, and SMF70INT. The valid format is a character string with a maximum length of 8 bytes.

Period Name
Name of the period. This is derived using fields SMF70DAT, SMF70IST, and SMF70INT from the record as parameters in the PERIOD function. The valid format is a character string with a maximum length of 8 bytes.

MVS System ID
This is the MVS system ID. This is the SMF system ID. From SMF70SID. The valid format is a character string with a maximum length of 4 bytes.

LPAR Name
Name of the logical partition. From SMF70LPM. The valid format is a character string with a maximum length of 8 bytes.

Processor Type
Name of the logical processor type. Possible values are: CP,ICF+ (includes IFA,IFL,ICF),IFA,IFL,ICF,IIP. From SMF70CIX. The valid format is a character string with a maximum length of 4 bytes.

Processor Complex Utilization
Total processor complex utilization for the partition, in percent. Calculated as 100*(CPU_DISPATCH_SEC - CPU_WAIT_SEC) / COMPLEX_SEC. The value must be an integer in the range of 0-2147483647.

Total Logical Processors
Total number of logical processor assigned to the partition for all

occurrences of LPROC shared. Each processor type is considered separately. The value must be an integer in the range of 0-2147483647.

LPAR Busy Percent
Busy time for the logical partition, as a percentage of the elapsed time. This value can be greater than 100% if more than one processor is assigned to the partition. Calculated as 100*CPU_DISPATCH_SEC/ MEASURED_SEC. The value must be an integer in the range of 0-2147483647.

LPAR Dispatched Percent
Time that the logical partition was dispatched, as a percentage of the allowed time. Calculated as 100*CPU_DISPATCH_SEC/ALLOWED_SEC.

LPAR Effective Disp Percent
Effective Time that the logical partition was dispatched, as a percentage of the allowed time. The value must be an integer in the range of 0-100.

LPAR Management Percent
Logical Partition management time, in percent. This is the percentage of physical LPAR management time if the partition name is *PHYSICAL. Calculated as 100*(CPU_DISPATCH_SEC-CPU_EFF_DISP_SEC)/ LPROC_SEC. The value must be an integer in the range of 0-100.

LPAR Spare Percent
Spare time for the logical partition, as a percentage of the allowed time for this partition. A minus sign for this value means that more than the allowed time was used. Calculated as 100*(ALLOWED_SEC-CPU_DISPATCH_SEC)/ALLOWED_SEC. The value must be an integer in the range of 0-100.

LPROC Busy Percent
Average logical processor busy time for the partition, in percent. Calculated as 100*CPU_DISPATCH_SEC/LP_ONLINE_SEC. The value must be an integer in the range of 0-100.

LPROC Dispatched Percent
Logical processor dispatch time, as a percentage of the time available for nondedicated processors. Calculated as 100*CPU_DISPATCH_PCT/ LPROC_SEC. The value must be an integer in the range of 0-100.

LPROC Effective Disp Percent
Effective dispatch time for the logical processor, as a percentage of the time available for nondedicated processors. Calculated as 100*CPU_EFF_DISP_SEC/LPROC_SEC. The value must be an integer in the range of 0-100.

Total IIP Processors
Total number of IIP physical processors assigned for use by PR/SM. From TOT_SPP_IIP_PRO. The value must be an integer in the range of 0-2147483647.

Total Physical CPUs
Total number of physical CPUs utilized in LPAR. The value must be an integer in the range of 0-2147483647.

System Statistics attributes

This table provides hourly, daily and monthly statistics on processor activity, paging and swapping activities, IPLs, and lost SMF data. They contain data from SMF types 0, 7, 70, 71 and 72 records.

Date Date when the activity occurred. From SMF0DTE or SMF7STD; or calculated from SMFxxDAT, SMFxxIST, and SMFxxINT; (where xx is the record type 70, 71, or 72). The valid format is a character string with a maximum length of 10 bytes.

Time Time (rounded down to the nearest hour) when the activity occurred. From SMF0TME or SMF7STM; or calculated from SMFxxDAT, SMFxxIST, and SMFxxINT; (where xx is the record type 70, 71, or 72). This column is only available in the Hourly table. The valid format is a character string with a maximum length of 8 bytes.

Period Name
Name of the period. This is derived using the SMF system ID, date, and time in the record as parameters in the PERIOD function. The valid format is a character string with a maximum length of 8 bytes.

MVS System ID
This is the SMF system ID. From SMF0SID, SMF7SID, SMF70SID, SMF71SID, or SMF71SID. The valid format is a character string with a maximum length of 4 bytes.

Average Batch Jobs
Average number of batch jobs run for the system. Calculated as the average of SMF70BTT/SMF70SAM. The value must be an integer in the range of 0-2147483647.

Processor Busy Time(seconds)
Processor busy time for all processors, in seconds. This is calculated as the sum of (SMF70INT/1000) - (SMF70WAT*0.000001/4096); or (SMF70PDT*0.000001) - (SMF70WAT*0.000001/4096); or SMF70PDT*0.000001. The value must be an integer in the range of 0-2147483647.

Max CPU Load Percent
Maximum CPU load, in percent. Calculated as the maximum of (CPU_BUSY_SEC/(SMF70INT/1000))*100. The value must be an integer in the range of 0-100.

Min CPU Load Percent
Minimum CPU load, in percent. Calculated as the minimum of (CPU_BUSY_SEC/(SMF70INT/1000))*100. The value must be an integer in the range of 0-100.

CPU Online Seconds
Sum of the measured time period times the number of online processors, in seconds. Calculated as the sum of SMF70INT/1000. The value must be an integer in the range of 0-2147483647.

Avg Avail. Frames Central Storage
Average number of available frames in central storage. This is the average of SMF71AVF. The value must be an integer in the range of 0-2147483647.

Max Avail. Frames Central Storage
Maximum number of available frames in central storage. This is the average of SMF71MXF. This column is only available in the Hourly table. The value must be an integer in the range of 0-2147483647.

Min Avail. Frames Central Storage
Minimum number of available frames in central storage. This is the average of SMF71MNF. This column is only available in the Hourly table. The value must be an integer in the range of 0-2147483647.

Avg IN Address Spaces
Average number of IN address spaces. This is a count of all swapped-in address spaces including address spaces ready to execute and not ready to execute. Calculated as the average of SMF70ITT/SMF70SAM. The value must be an integer in the range of 0-2147483647.

Avg OUT Ready Address Spaces
Average number of out and ready address spaces. Calculated as the average of SMF70OTT/SMF70SAM. The value must be an integer in the range of 0-2147483647.

Number of Page Ins
Number of non-VIO, non-swap, and hiperspace page-ins. Calculated as the sum of (SMF71PIN + SMF71HIN). The value must be an integer in the range of 0-2147483647.

Number of Page Outs
Number of non-VIO, non-swap, and hiperspace page-outs. Calculated as the sum of (SMF71POT + SMF71HOT). The value must be an integer in the range of 0-2147483647.

Number of VIO Page Ins
Number of VIO page-ins. This is the sum of SMF71VIN. The value must be an integer in the range of 0-2147483647.

Number of VIO Page Outs
Number of VIO page-outs. This is the sum of SMF71VOT. The value must be an integer in the range of 0-2147483647.

Number of Pages Swapped In
Number of pages swapped in. This is the sum of SMF71SIN. The value must be an integer in the range of 0-2147483647.

Number of Pages Swapped Out
Number of pages swapped out. This is the sum of SMF71SOT. The value must be an integer in the range of 0-2147483647.

SRB Execution Time(seconds)
SRB execution time, in seconds. Calculated as the sum of SMF72STS*SMF72ADJ/16000000/SMF72SSD or when in workload management goal mode as the sum of R723CSRB*R723MADJ/1600/ R723MSRB. The value must be an integer in the range of 0-2147483647.

Average Started Tasks
Average number of started tasks for the system. Calculated as the average of SMF70STT/SMF70SAM. The value must be an integer in the range of 0-2147483647.

Swap Sequences
Number of address space swap sequences. A swap sequence consists of an address space swap-out and swap-in. This is the sum of SMF71SSQ. The value must be an integer in the range of 0-2147483647.

Sysplex Name
This is the name of the sysplex. From SMF70XNM. The valid format is a character string with a maximum length of 8 bytes.

TCB Execution Time(seconds)
TCB execution time, in seconds. Calculated as the sum of SMF72CTS*SMF72ADJ/16000000/SMF72CSD or when in workload management goal mode as the sum of R723CCPU*R723MADJ/1600/

R723MCPU. Note: It includes CPU time on standard CP as well as on IFA processors. The value must be an integer in the range of 0-2147483647.

Average TSO Users
Average number of TSO users for the system. Calculated as the average of SMF70TTT/SMF70SAM. The value must be an integer in the range of 0-2147483647.

Maximum Concurrent TSO Users
Maximum number of concurrent TSO users for the system. This is the maximum of SMF70TMM. The value must be an integer in the range of 0-2147483647.

Coupling Facility Statistics attributes

This table provides data about coupling facility utilization in a sysplex. The data comes from SMF type 74, subtype 4 records.

Date Date of the mid measurement. From SMF74DAT, SMF74IST, and SMF74INT.

Time Time (rounded down as specified in the MVSPM_TIME_RES table of the mid measurement. From SMF74DAT, SMF74IST, and SMF74INT.

Period Name
Name of the period. This is derived using fields SMF74DAT, SMF74IST, and SMF74INT from the record as parameters in the PERIOD function.

MVS System ID
MVS system identification. From SMF74SID.

Sysplex Name
Sysplex name (as defined in ECVTSPLX). From SMF74XNM.

CF Name
Name of coupling facility. From R744FNAM.

Structure Name
Name of structure connected to this system or allocated in this coupling facility. From R744QSTR or R744SNAM.

Structure Type
Structure type Identifier. Calculated as the max of R744STYP.

CF Model
Model of coupling facility. From R744FMOD.

CF Version
Version of coupling facility. From R744FVER.

CF Level
Level of coupling facility. From R744FLVL.

Request Rate per second
Requests completed per second. Calculated as (REQ_SYNC_NO+REQ_ASYNC_NO+REQ_SYNC_ASYNC)/ MEASURED_SEC.

Synchronous Requests per second
Synchronous requests completeted per second. Calculated as REQ_SYNC_NO/MEASURED_SEC.

Synchronous Requests Average Time
Average time required to satisfy a synchronous CF request, in microseconds. Calculated as SERVICE_SYNC_SEC/REQ_SYNC_NO.

Asynchronous Requests per second
Asynchronous requests completeted per second. Calculated as REQ_ASYNC_NO/MEASURED_SEC.

Asynchronous Requests Average Time
Average time required to satisfy an asynchronous CF request, in microseconds. Calculated as SERVICE_ASYNC_SEC/REQ_ASYNC_NO.

Changed Operations Rate
Percentage of changed operations from synchronous to asynchronous. Calculated as REQ_SYNC_ASYNC/(REQ_SYNC_NO+REQ_ASYNC_NO)* 100.

Changed Operations per second
Number of changed operations per second. Calculated as REQ_SYNC_ASYNC/MEASURED_SEC.

Subchannel Busy Rejections per second
Number of requests rejected per second for subchannel busy. Calculated as SUBCH_CONTENTION/MEASURED_SEC.

Path Busy Rejections per second
Number of requests rejected per second for path busy. Calculated as PATH_CONTENTION/MEASURED_SEC.

Delayed Requests Percent
Percentage of delayed requests. Calculated as (PATH_CONTENTION+SUBCH_CONTENTION+REQ_QUEU ED_NO+REQ_DELAYED_NO)/(REQ_SYNC_NO+REQ_ASY NC_NO+REQ_SYNC_ASYNC)*100.

Subchannel Busy Delays per second
Percentage of delayed requests for subchannel busy. Calculated as SUBCH_CONTENTION/(REQ_SYNC_NO+REQ_ASYNC_NO +REQ_SYNC_ASYNC)*100.

Path Busy Delays Percent
Percentage of delayed requests for path busy. Calculated as PATH_CONTENTION/(REQ_SYNC_NO+REQ_ASYNC_NO+ REQ_SYNC_ASYNC)*100.

Delayed Queue Requests Percent
Percentage of delayed requests for queue. Calculated as REQ_QUEUED_NO/(REQ_SYNC_NO+REQ_ASYNC_NO+RE Q_SYNC_ASYNC)*100.

Delayed Dump Requests Percent
Percentage of delayed requests for dump serialization. Calculated as REQ_DELAYED_NO/(REQ_SYNC_NO+REQ_ASYNC_NO+R EQ_SYNC_ASYNC)*100.

Peer Subchannel Wait Percent
Percentage of requests waiting for peer subchannel conditions. Valid only for duplexed structures. Calculated as PEER_WAIT_SCH_NO/ (REQ_SYNC_NO+REQ_ASYNC_NO +REQ_SYNC_ASYNC)*100.

Peer Completion Wait Percent
Percentage of requests waiting for peer completion conditions. Valid only

for duplexed structures. Calculated as PEER_WAIT_CMP_NO/ (REQ_SYNC_NO+REQ_ASYNC_NO +REQ_SYNC_ASYNC)*100.

TCPIP Server Connections attributes

This table provides z/OS TCP/IP statistics on connection activity for servers.

Date Date of connection establishment. From AP_TTSDate.

Time Time of connection establishment. From AP_TTSTime.

Sysplex Name
Sysplex name from SYSPLEX in COUPLExx. From TI_SysplexName.

MVS System ID
MVS SYSTEM ID. This is the SMF SYSTEM ID. From SMFHDSID.

Sub System ID
Subsystem Identification. This is the value set by the SUBSYS=option specified in the SMF macros. From SMFHDSSI.

Local IP Address
Local IP address at time of connection close. From AP_TTLIP.

Local Port
Local port number at time of connection close. From AP_TTLPort.

MVS System Name
System name from SYSNAME in IEASYSxx. From TI_SYSName.

TCPIP Stack Name
TCP/IP stack name. From TI_Stack.

Connections
Number of connections in the interval.

Average Connection Duration
Average duration time of connections.

Inbound Bytes(kb)
Inbound bytes count, in kilobytes. From AP_TTInBytes.

Outbound Bytes(kb)
Outbound bytes count, in kilobytes. From AP_TTOutBytes.

Average Round TripTime
Average of round trip time at connections closure, in milliseconds. From AP_TTRTT.

Retransmissions
Number of times a retransmission was required. From AP_TTXRT.

Workload Statistics attributes

This table provides statistics on MVS activity by workload type and service class, when the system is running in goal mode. It contains data from SMF type 72, subtype 3 records.

Date Date when the workload activity occurred. From SMF72DAT, SMF72IST, and SMF72INT.

Time Time (rounded down to nearest hour) when the workload activity occurred. From SMF72DAT, SMF72IST, and SMF72INT.

Period Name
Name of the period. This is derived using fields SMF72DAT, SMF72IST, and SMF72INT from the record as parameters in the PERIOD function.

Sysplex Name
Sysplex name. This is the name of the sysplex. From SMF72XNM.

MVS System ID
MVS system identification. From SMF72SID.

Workload Type
MVS workload type name. From WORKLOAD_TYPE in the MVS_WORKLOAD2_TYPE lookup table.

Workload Group
MVS workload group name. From R723MWNM.

Service Class
Service or report class name. From R723MCNM.

Service Policy
Service policy name. From R723MNSP.

Service Class Period
Service or report class period number. From R723CPER.

Service Class Type
Service class (SC) type. This can be: C for control, or R for reporting. All data in reporting SCs is also reported in a control SC, so when summaries are produced, only control SCs should be selected. From R723MSCF.

System Name
MVS system name. This is the MVS system name. From SMF72SNM.

Subsystem ID
Name of the subsystem associated with the service class. From R723RTYP.

Processor Capacity
Total CPU capacity, in CPU service units. Calculated as the sum of SMF72INT*R723MCPU*1.6/R723MADJ.

Transactions Ended
Number of transactions ended. This is the sum of R723CRCP.

Transactions Ended Within Goal
Number of transactions ended, within response time goal. This is the sum of R723TRDB for GOAL_PERCENTAGE <= 100.

Active Time all Transactions
Active time of all transactions, in seconds. This includes the total time that each transaction was in central storage plus any swapped-out time. Calculated as the sum of R723CTAT*0.001024.

Elapsed Time all Transactions
Elapsed time accumulated by all transactions that ended in this performance group period, in seconds. Calculated as the sum of R723CTET*0.001024.

Execution Time all Transactions
Execution time accumulated by all transactions that ended in this performance group period, in seconds. Calculated as the sum of R723CXET*0.001024.

Total Processor Service Units
Total CPU weighted service units. This is the sum of R723CCPU.

Total SRB Service Units
Total SRB weighted service units. This is the sum of R723CSRB.

Total Main Storage Service Units
Total main-storage service units. This is the sum of R723CMSO.

Total IO Service Units
Total I/O service units. This is the sum of R723CIOC.

Total Service Units
Total service units used in all transactions. This is the sum of R723CSRV.

TCB Seconds
TCB CPU time calculated from the number of CPU service units, in seconds. Calculated as the sum of R723CCPU*R723MADJ/1600/R723MCPU. Note: It includes CPU time on standard CP as well as on IFA and IIP processors.

SRB Seconds
SRB CPU time calculated from the number of CPU service units, in seconds. Calculated as the sum of R723CSRB*R723MADJ/1600/R723MSRB.

RCT Seconds
Region control task time, in seconds. Calculated as the sum of R723CRCT/1000000.

IO Count
Number of I/Os calculated from the number of I/O service units. Calculated as the sum of 10000*R723CIOC/R723MIOC.

Total Delay Samples
Number of delay samples. This is the sum of R723CTOT.

Average Response Time Goal
Average response time goal, in seconds. From R723CVAL (converted to seconds using R723CRTF) if R723CRGF is equal to X'40', otherwise set to zero.

Goal Percentile
Percentile response time goal, in percent. From R723CPCT if R723CRGF is equal to X'80', otherwise set to zero.

Goal Importance
Relative importance of the goal to be achieved for this service class period (1=highest - 5=lowest). Calculated as the maximum of R723CIMP.

Execution Velocity Goal(pct)
Execution velocity goal, in percent. From R723CVAL if R723CRGF is equal to X''20'', otherwise set to zero.

Goal Flag
Goal flag; 0=percentile response time goal, 1=average response time goal, 2=execution velocity goal, 3=discretionary goal, 4=system specified goal. From R723CRGF.

IFA Seconds
Time used for IFA processing, in seconds. Calculated as the sum of (R723IFAT*R723NFFI/256)/1000000.

IIP Seconds
Time (seconds) used for IIP processing, normalised to the CP equivalent. Calculated as the sum of ((R723CSUP * R723MADJ) /(1600 * R723MCPU)) * R723NFFS / 256.

zLinux Statistics attributes

This table provides statistics on zLinux utilization. It contains CPU and memory usage, paging rate and number of users and processes from ZLINUX_CPU records with record type ''PERF'' and subtype ''VM''.

Date Date when the record was written. From DATE.

Time Time (rounded down to the nearest hour) when the record was written. From TIME.

Node Name
Node name. From NODE_NAME.

System Name
System name. From SYSTEM_NAME.

Period Name
Name of the period. This is derived using fields NODE_NAME , DATE and TIME from the record as parameters in the PERIOD function.

Total Measured Time(sec)
Total measured time, in seconds. This is the sum of INTERVAL*60.

Records Collected
Total number of records. This is the count of records.

Minimum Free Memory Pages
Minimum number of free pages. This is the minimum of MEMORY_MIN, in KByte.

Average Free Memory Pages
Average number of free pages. This is the average of MEMORY_AVG, in KByte.

Maximum Free Memory Pages
Maximum number of free pages. This is the maximum of MEMORY_MAX, in KByte.

Minimum CPU Usage(pct)
Minimum CPU usage, in percent. This is the minimum of CPU_MIN.

Average CPU Usage(pct)
Average CPU usage, in percent. This is the average of CPU_AVG.

Maximum CPU Usage(pct)
Maximum CPU usage, in percent. This is the maximum of CPU_MAX.

Minimum Paging Rate
Minimum number of pages paged IN/OUT per second. This is the minimum of PAGING_MIN.

Average Paging Rate
Average number of pages paged IN/OUT per second. This is the average of PAGING_AVG.

Maximum Paging Rate
Maximum number of pages paged IN/OUT per second. This is the maximum of PAGING_MAX.

Minimum Users
Minimum number of users. This is the minimum of USERS.

Average Users
Average number of users. This is the average of USERS.

Maximum Users
Maximum number of users. This is the maximum of USERS.

Minimum Processes
Minimum number of processes. This is the minimum of PROCESSES.

Average Processes
Average number of processes. This is the average of PROCESSES.

Maximum Processes
Maximum number of processes. This is the maximum of PROCESSES.

DB2 column names represented by each attribute group

Every attribute within each attribute group for the Monitoring Agent represents a physical DB2 table and DB2 column name within the IBM Tivoli Decision Support for z/OS DB2 database. See Appendix A, "Mapping attributes to the Tivoli Decision Support for z/OS DB2 database," on page 173 to view the DB2 table names and column names for all of the monitoring agents corresponding attribute groups and attributes.

Chapter 5. Creating queries

Graph and table views use queries to specify which attribute values and monitored resources to request from a Tivoli Enterprise Monitoring Agent. You can use the Query Editor to create a new query, modify an existing one, or apply filters and set styles to define the content and appearance of a view based on an existing query. For instructions on using the Query Editor, see the Tivoli Enterprise Portal online help or *IBM Tivoli Monitoring: User's Guide*.

This chapter details query customizations which can be made to help you access the IBM Tivoli Decision Support for z/OS data from the DB2 database in customized workspaces to meet the needs of your enterprise.

Using filters on your custom queries

When creating or customizing queries for the IBM Tivoli Decision Support for z/OS Monitoring Agent care must be taken to determine how much row data will be returned once the query is executed. The IBM Tivoli Decision Support for z/OS DB2 database can contain vast amounts of data. In some cases many millions of rows in a single table. To create a query which selects every row from a large table will cause an extreme performance overhead for not only the Monitoring Agent, but also the network with the high volumes of data being passed between the monitoring agent and the Tivoli Enterprise Portal client. To get the most out of your chart and table views we recommend you use filter criteria to keep the number of rows returned from your queries to a minimum.

For every filter criteria a query contains, an extra predicate is built into the SQL WHERE clause when the Monitoring Agent goes to query the IBM Tivoli Decision Support for z/OS data from its DB2 database. The more specific your filter criteria is the faster each query will run, and you can maximize the efficiency of the monitoring agent and make better use of the data within your charts and views.

For more information on creating custom queries see the *IBM Tivoli Monitoring: User's Guide*.

Adding constraints to your custom queries

The IBM Tivoli Decision Support for z/OS monitoring agent uses the **Constraints** tab from within the **Advanced Options** window to perform some special customizations to your query. To access the **Constraints** tab click **Advanced** in the Query editor to open the **Advanced Options** window, and then click on the **Constraints** tab. See Figure 6 on page 74 for an example of the **Constraints** tab under the **Advance Options** window.

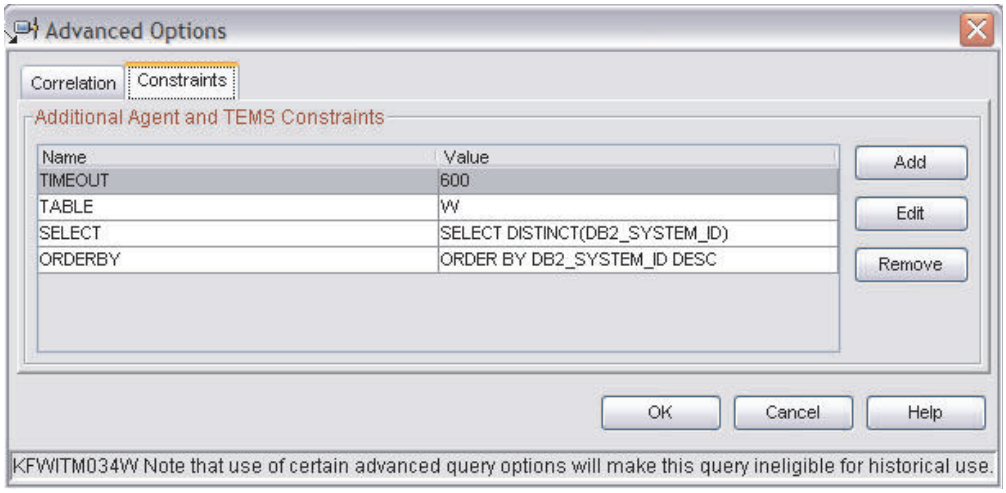

Figure 6. Adding constraints to your query

Note: The **Constraints** tab is only available when the current user is in workspace administration mode.

Constraints will not always be required for a custom query, however you will need to use them if you wish to select data from a table period other than the default. For example for a query against the DB2 Transactions attribute group, you may wish to view data at the weekly level rather than the default of daily. You can also use constraints to add specific customization to the SQL query which is generated every time the query is executed.

Below is a list of the available constraints in the query editor used by the IBM Tivoli Decision Support for z/OS Monitoring Agent:

- TABLE
- SELECT
- ORDERBY
- GROUPBY
- TIMEOUT

The TABLE Constraint

For every attribute group within the IBM Tivoli Decision Support for z/OS Monitoring Agent, the data that the group represents can be viewed in several different time periods. For example, the CICS Transactions attribute group contains weekly, daily, and hourly-summarized data. By default, a query without any TABLE constraint will display data in the time periods shown in Table 2.

Table 2. Default time periods for attribute groups

Attribute Group	Time Period
CICS Transactions	Daily
DB2 Transactions	Daily
Device Statistics	Hourly
IMS Transactions	Daily
Interval Job Step Accounting	Daily
Logical Partition Statistics	Daily
System Statistics	Daily

Table 2. Default time periods for attribute groups (continued)

Attribute Group	Time Period
DFSMS Volume Information	Daily
Coupling Facility Statistics	Hourly
TCPIP Server Connections	Daily
Workload Statistics	Daily
zLinux Statistics	Daily

To change the period for which you wish to view data, add a TABLE constraint where the constraint name is TABLE and the value is the first character of the time period on which you wish to view data. For example, to view data at a weekly level for CICS Transactions, the value is W.

All attribute groups do not have the same time period summarizations. See Table 3 for the valid constraint values for each attribute group. Any value other than the valid constraint values will result in the default time period for the attribute group being used (see Table 2 on page 74 for each attribute group).

Table 3. Valid time periods for each attribute group

Attribute group	Valid constraint value	Time period
CICS Transactions	W D H	Weekly Daily Hourly
DB2 Transactions	W D	Weekly Daily
Device Statistics	H	Hourly
IMS Transactions	W D H	Weekly Daily Hourly
Interval Job Step Accounting	M D H	Monthly Daily Hourly
Logical Partition Statistics	M D H	Monthly Daily Hourly
System Statistics	M D H	Monthly Daily Hourly
DFSMS Volume Information	M D	Monthly Daily
Coupling Facility Statistics	H	Hourly
TCPIP Server Connections	W D H	Weekly Daily Hourly
Workload Statistics	M D H	Monthly Daily Hourly
zLinux Statistics	M D M	Monthly Daily Hourly

The SELECT Constraint

By default all the attributes for an attribute group are selected from the table when the query is executed. It is however possible to change the queries SQL SELECT statement by creating a constraint name of SELECT and setting the constraint value to the SELECT statement which you desire.

Note that the value provided in the SELECT constraint is passed directly into the SQL statement which is used against the IBM Tivoli Decision Support for z/OS DB2 database. This means that the attributes referenced in the SELECT constraint value must represent the physical DB2 column names and not the attribute names of the monitoring agent. See Appendix A, "Mapping attributes to the Tivoli Decision Support for z/OS DB2 database," on page 173 to view the DB2 table names and column names for all of the monitoring agents corresponding attribute groups and attributes.

Below shows example uses of the SELECT constraint:

SELECT MVS_SYSTEM_ID,DATE,TIME
Select three columns rather than all attributes within the group.

SELECT DISTINCT(MVS_SYSTEM_ID)
Select the distinct or unique MVS System IDs from within the table.

SELECT DATE,SUM(TRANSACTIONS) AS TRANSACTIONS
Here a total sum of all the transactions for each date in the table is returned. Note that when using SQL aggregate functions such as COUNT, SUM, MIN and MAX, the SQL statement will return a null column header. So that the monitoring agent knows what attribute the data being returned is for, you need to use the AS feature to define the column name. Also note that aggregate functions also require a GROUP BY clause, otherwise an SQL error will be returned. See "The GROUPBY Constraint" on page 77 for more information on this.

For simplicity in your queries, we recommend you use the SELECT constraint only if you cannot achieve the desired query through use of the filters as described at the top of this chapter.

The ORDERBY Constraint

The ORDERBY constraint can be used to order the data returned by the SQL query from the IBM Tivoli Decision Support for z/OS DB2 tables by the columns specified. Below is an example usage of the SELECT constraint:

Note that the value provided in the ORDERBY constraint is passed directly into the SQL statement which is used against the IBM Tivoli Decision Support for z/OS DB2 database. This means that the attributes referenced in the ORDERBY constraint value must represent the physical DB2 column names and not the attribute names of the monitoring agent. See Appendix A, "Mapping attributes to the Tivoli Decision Support for z/OS DB2 database," on page 173 to view the DB2 table names and column names for all of the monitoring agents corresponding attribute groups and attributes.

Below is an example usage of the ORDERBY constraint:

ORDER BY DATE DESC
Order the rows by the DATE column descending.

ORDER BY DATE DESC,MVS_SYSTEM_ID
Order the rows by the DATE column descending and within that by the MVS_SYSTEM_ID column.

Note that the order of rows being displayed in the Tivoli Enterprise Portal client can still be overridden by the user by using the features of the portal client. For example, in a table view the user can click on column headings to reorder the table based on the column you selected.

The GROUPBY Constraint

The SQL GROUPBY clause can be used in a SQL statement to collect data across multiple records and group the results by one or more columns. You will need to set the GROUPBY constraint when you have used the SELECT constraint to include an aggregate function such as COUNT, SUM, MIN and MAX. Not including a GROUP BY in the SQL statement in these instances will result in an SQL error when the query is executed.

Note that the value provided in the GROUPBY constraint is passed directly into the SQL statement which is used against the IBM Tivoli Decision Support for z/OS DB2 database. This means that the attributes referenced in the GROUPBY constraint value must represent the physical DB2 column names and not the attribute names of the monitoring agent. See Appendix A, “Mapping attributes to the Tivoli Decision Support for z/OS DB2 database,” on page 173 to view the DB2 table names and column names for all of the monitoring agents corresponding attribute groups and attributes.

Below is an example usage of the GROUPBY constraint:

GROUP BY DATE
Group the results by the DATE column.

GROUP BY CICS_SYSTEM_ID,DATE
Group the results by the CICS_SYSTEM_ID column, and within that the DATE column.

The TIMEOUT Constraint

The TIMEOUT constraint sets the view so that attempts to render it will discontinue after the number of seconds specified in the constraint value. For example, a TIMEOUT constraint value of 600 cancels the workspace refresh if it has not completed after 10 minutes.

Errors in Constraints

If you receive no data in your workspace views after customizing your query, either no rows satisfied the query request, or an error occurred due to a constraint which was not formatted correctly.

The most likely cause of a query that is not valid is where a constraint has been created which produces invalid SQL syntax and when the query is executed against the IBM Tivoli Decision Support for z/OS DB2 database and an SQL error occurs. This happens if you have referenced a column in a constraint which does not exist in the DB2 table which is being queried, or if you have used an aggregate function such as COUNT, SUM, MIN, or MAX in a SELECT constraint without including a GROUPBY constraint.

Errors in Constraints

Any error messages from queries formed by invalid constraints are displayed in the DRLOUT for the monitoring agent started task. The DRLOUT sysout data set or spool file contains information and error messages related to the SQL queries that the monitoring agent is performing against the IBM Tivoli Decision Support for z/OS DB2 database. If any SQL errors have occurred when the monitoring agent queried the DB2 database for data, then the SQL code is displayed in here.

If the DRLOUT sysout data set or spool file does not exist then no errors have been captured during the execution of any SQL queries to collect data for the monitoring agent from the IBM Tivoli Decision Support for z/OS DB2 database. If errors do exist in DRLOUT, view the error message and take the appropriate action to correct the problem.

Part 2. Installation and Configuration

Chapter 6. Planning your Tivoli Decision Support for z/OS Monitoring Agent configuration

In this chapter, you will learn about the components of Tivoli Decision Support for z/OS monitoring agent, and gather the information you need to make decisions about your configuration.

When the Tivoli Decision Support for z/OS monitoring agent is installed, it operates within the management infrastructure of the IBM Tivoli Monitoring environment.

Table 4. IBM Tivoli monitoring environment

Tivoli Decision Support for z/OS Version	IBM Tivoli Monitoring Version
v1.8.0	v6.1.0 with Fix Pack 5
v1.8.1	v6.2.1

You should already be familiar with the management infrastructure installed in your enterprise environment, including the use of the Tivoli Enterprise Portal to navigate workspaces and views, the Tivoli Enterprise Monitoring Server, Tivoli Enterprise Portal Server, and how they are controlled using the Manage Tivoli Enterprise Monitoring Services console. See "Bibliography" on page 197 for more information on these prerequisite systems.

Some components of this environment, for example, the Tivoli Enterprise Portal run only on distributed systems (Windows or UNIX). The Tivoli Enterprise Monitoring Server runs on either a distributed or z/OS operating system. This monitoring agent runs on the same z/OS system where your Tivoli Decision Support for z/OS base product is installed.

You should already be familiar with the various deployment options available to you in the IBM Tivoli Monitoring environment, and determined where this monitoring agent will be installed.

To complete the installation and configuration process, you must complete certain steps on both the z/OS operating and distributed systems. The installation steps for these components can be performed simultaneously, but some of the configuration steps require that specific components are already installed.

The following sections describe the high-level flow of the installation and configuration tasks that must be performed.

Software and hardware prerequisites for installation

Before you begin the tasks of installing and configuring the Tivoli Decision Support for z/OS monitoring agent, be sure to complete these prerequisite steps:

1. Read the *Program Directory* and complete all the installation requirements listed there.
2. Determine where your IBM Tivoli Decision Support for z/OS base product is installed, so you know where to deploy the monitoring agent.

Tivoli Decision Support for z/OS prerequisites

The monitoring agent requires Version 1.8.0 or higher of Tivoli Decision Support for z/OS to be installed. The monitoring agent also requires DB2 views that are supplied as a part of the Tivoli Decision Support for z/OS v1.8.0 GA APAR to be created on your DB2 database. The additional Tivoli Decision Support for z/OS DB2 views are used by the monitoring agent to query the data which is then displayed in the workspaces on the Tivoli Enterprise Portal client. Each of these DB2 views are created by installing the Monitoring Agent Component from within the Tivoli Decision Support for z/OS administration dialog.

See "Step 7: Creating the DB2 views for the monitoring agent" on page 117 for information on how to create these DB2 views.

IBM Tivoli Monitoring prerequisites

The Tivoli Decision Support for z/OS monitoring agent package does not include IBM Tivoli Monitoring and all of its prerequisites.

1. A complete list of Tivoli Decision Support for z/OS monitoring agent hardware and software prerequisites is located in the *Program Directory for Tivoli Decision Support for z/OS*.
2. Prerequisites for the distributed IBM Tivoli Monitoring Services components are located in the *IBM Tivoli Monitoring: Installation and Setup Guide*.

The Tivoli Decision Support for z/OS monitoring agent uses the IBM Tivoli Monitoring infrastructure (also referred to as IBM Tivoli Monitoring Services, or Tivoli Management Services) at the levels defined in the following table:

Tivoli Decision Support for z/OS Version	IBM Tivoli Monitoring Version
v1.8.0	v6.1.0 with Fix Pack 5
v1.8.1	v6.2.1

The IBM Tivoli Monitoring Services infrastructure provides security, data transfer and storage, notification mechanisms, user interface presentation, and communication services for products in the IBM Tivoli Monitoring and OMEGAMON XE suites in an agent-server-client architecture.

Prior to installing the Tivoli Decision Support for z/OS monitoring agent you must have installed and configured the IBM Tivoli Monitoring Services infrastructure to the minimum level defined in the above table. See the *IBM Tivoli Monitoring: Installation and Setup Guide* for more information on planning, installing and configuring your IBM Tivoli Monitoring Services environment.

To install and configure the Tivoli Enterprise Monitoring Server on a z/OS system, see the *IBM Tivoli Monitoring: Configuring Tivoli Enterprise Monitoring Server on z/OS* book. If your Tivoli Enterprise Monitoring Server and Tivoli Enterprise Portal Server are all located on the distributed platform, you will still be required to install the Tivoli Monitoring Services on z/OS because it includes common components which are required by the Tivoli Decision Support for z/OS monitoring agent.

The IBM Tivoli Decision Support for z/OS monitoring agent has a prerequisite for the following IBM Tivoli Monitoring FMIDs to be installed on the z/OS system before installing and configuring the monitoring agent:

Tivoli Decision Support for z/OS Version	FMID	Description
v1.8.0	HKDS610 HKCI310 HKLV610	Tivoli Enterprise Monitoring Server on z/OS (only required if your Tivoli Enterprise Monitoring Server will be on z/OS). Configuration Assistance Tool. ITMS:Engine
v1.8.1	HKDS621 HKCI310 HKLV621	Tivoli Enterprise Monitoring Server on z/OS (only required if your Tivoli Enterprise Monitoring Server will be on z/OS). Configuration Assistance Tool. ITMS:Engine

The IBM Installation and Configuration Assistance Tool (ICAT), also referred to as the Configuration Tool, is required to configure any z/OS-based components, including the Tivoli Enterprise Monitoring Server on the z/OS operating system, and the IBM Tivoli Decision Support monitoring agent. Version 310 of the Installation and Configuration Assistance Tool is required, and it is a pre-requisite that this has been installed before you begin installing of the IBM Tivoli Decision Support monitoring agent on z/OS. If you have an earlier version of the Installation and Configuration Assistance Tool on your z/OS operating system, you are required to replace it with the IBM Installation and Configuration Assistance Tool version 3.1.0 before continuing installation of the monitoring agent.

Security prerequisites

Security for a Tivoli Enterprise Monitoring Server on a z/OS operating system is based on password validation using the local operating system. You can use Resource Access Control Facility (RACF®) (which is part of the z/OS operating system) or another product to provide user authentication.

Understanding Product Packaging

If you are installing monitoring agents for the first time, you will find familiar IBM packaging types (such as Passport Advantage), installation tools (such as SMP/E or InstallShield), and installation documentation, including a Program Directory.

Each zSeries product provides a program directory that describes the z/OS installation steps required to move the product code from the distribution media to your DASD, whether it is distributed on tape or electronically.

The contents of the Tivoli Decision Support for z/OS monitoring agent product package are shown in Table 5:

Table 5. Valid time periods for each attribute group

Media	Name and description	Target
Media set 1 of 3: Distributed installation		

Table 5. Valid time periods for each attribute group (continued)

Media	Name and description	Target
CDs	The IBM Tivoli Decision Support for z/OS Monitoring Agent Application Support CDs contain the predefined workspaces, online help, expert advice, and IBM Tivoli Decision Support for z/OS Monitoring Agent data for the Tivoli Enterprise Portal. This CD also contains data for adding IBM Tivoli Decision Support for z/OS Monitoring Agent application support to the Tivoli Enterprise Monitoring Server.	Distributed environment
	IBM Tivoli Decision Support for z/OS Language Support	
	IBM Tivoli Monitoring Services is a prerequisite for IBM Tivoli Decision Support for z/OS Monitoring Agent. IBM Tivoli Monitoring Services needs to be obtained, installed, and configured separately to the IBM Tivoli Decision Support for z/OS Monitoring Agent. IBM Tivoli Monitoring media includes subdirectories and installation procedures on Windows, UNIX, Intel, and Linux on zSeries operating systems for the following components: • Tivoli Enterprise Monitoring Server • Tivoli Enterprise Monitoring Agents • Tivoli Enterprise Portal Server • Tivoli Enterprise Portal Clients (Desktop and Web Browser)	
	IBM DB2® Universal Database™ Enterprise Server Edition Version 8.2 is a prerequisite for IBM Tivoli Monitoring Services. This provides database functionality to IBM Tivoli Monitoring Services on Windows, AIX(R), HP-UX, Solaris, or Linux operating systems. IBM DB2 Universal Database needs to be obtained, installed, and configured separately to the IBM Tivoli Decision Support for z/OS Monitoring Agent.	
Media set 2 of 3: z/OS installation		

Table 5. Valid time periods for each attribute group (continued)

Media	Name and description	Target
Tape	IBM Tivoli Decision Support for z/OS Monitoring Agent tape or electronic tape image provides the product components that run on the z/OS system in SMP/E relfile format.	Host environment
	IBM Tivoli Monitoring Services is a prerequisite for IBM Tivoli Decision Support for z/OS Monitoring Agent. IBM Tivoli Monitoring Services needs to be obtained, installed, and configured separately to the IBM Tivoli Decision Support for z/OS Monitoring Agent. IBM Tivoli Monitoring Services on z/OS includes the following: • Tivoli Enterprise Monitoring Server on z/OS • IBM Tivoli Configuration Tool • Common components	
Media set 3 of 3: Product documentation		
	IBM Tivoli Decision Support for z/OS Documentation can be found on the IBM Tivoli Information Center at the following URL: http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/index.jsp?toc=/com.ibm.tivoli.dszos.doc/toc.xml	
	• IBM Tivoli Decision Support for z/OS Monitoring Agent Program Directory • IBM Tivoli Decision Support for z/OS Monitoring Agent License Information	

Planning the deployment for your environment

The IBM Tivoli Monitoring environment requires installation and configuration to be performed on both distributed and z/OS operating systems where some of the system components are installed and run. This book is written assuming that you have already installed the base operating system components on distributed or z/OS operating systems in your environment, and upgraded to the necessary fix-pack levels where required. The IBM Tivoli Monitoring publications cover this information in detail.

When you planned and installed your IBM Tivoli Monitoring environment, you should consider the following information and make decisions about your deployment:

- Which monitoring agents are available to monitor your environment.
- The various deployment possibilities for installing components on distributed and z/OS operating systems in your enterprise, based on what monitoring agents you plan to run, the number of systems that you plan to monitor, and their operating system type.
- Placing your Tivoli Enterprise Monitoring Servers on a z/OS operating system or on distributed machines.

- Deciding to have multiple hub Tivoli Enterprise Monitoring Servers or one hub server and several remote Tivoli Enterprise Monitoring Servers, and how many of each are needed.
- Deciding how many Tivoli Enterprise Portal Servers to deploy.
- The impact that such decisions have on performance and disaster recovery.

Tivoli Enterprise Monitoring Server planning issues

You must have already installed at least one hub Tivoli Enterprise Monitoring Server. You can place this server on any of the supported distributed or z/OS operating system environments.

Depending on the products you want to install, you might deploy one or more remote Tivoli Enterprise Monitoring Servers to supported z/OS operating systems or distributed systems. You must configure the remote Tivoli Enterprise Monitoring Servers to connect directly to the hub Tivoli Enterprise Monitoring Server.

You might choose to install only a hub Tivoli Enterprise Monitoring Server on a distributed operating system, for example, the Windows operating system, and then configure all of the z/OS based monitoring agent address spaces to connect to that hub, or, similarly, install a hub server on a z/OS system and configure the monitoring agents on the distributed systems. In other cases you might choose to have one or more remote Tivoli Enterprise Monitoring Servers with some monitoring agents configured to connect to one remote server and some connecting to a different remote server. It is your decision on how to distribute the monitoring agent load among multiple Tivoli Enterprise Monitoring Servers.

Situations ultimately must run in a Tivoli Enterprise Monitoring Server, so you might distribute the situation processing among several Tivoli Enterprise Monitoring Servers. With several Tivoli Enterprise Monitoring Servers in the configuration there are automatic recovery options should one remote Tivoli Enterprise Monitoring Server fail. Note that the IBM Tivoli Decision Support for z/OS monitoring agent does not use situations.

If you are using a Shared Consolidated Software Inventory (CSI) and intend to use a Tivoli Enterprise Monitoring Server on a z/OS operating system as the hub server, you must configure the hub before you configure any remote Tivoli Enterprise Monitoring Server. If the Tivoli Enterprise Monitoring Servers you configure are connecting to a hub on a distributed system, install and then configure (or upgrade) the hub server before you configure the remote servers.

You cannot connect to the Tivoli Enterprise Portal until you have configured and started the hub Tivoli Enterprise Monitoring Server. You are not able to view data in the Tivoli Enterprise Portal client until you have started the remote Tivoli Enterprise Monitoring Servers and the monitoring agents that report to them.

Considerations for installing and configuring the monitoring agent

As you plan for the deployment of the IBM Tivoli Decision Support for z/OS monitoring agent into your z/OS base operating system environment, consider the following additional deployment and configuration options:

- Determine the z/OS system where IBM Tivoli Decision Support is running as this is where the monitoring agent needs to be installed.
- Decide whether to place the monitoring agent within the same address space as the Tivoli Enterprise Monitoring Server.

- Understand what levels of the z/OS operating system are supported and what prerequisites are required for these systems. See the *Program Directory* for the IBM Tivoli Decision Support for z/OS monitoring agent for more information.
- How to set up the basic configuration:
  1. Understanding the basic configuration options and how to create a basic configuration
  2. Installing and configuring the monitoring agent in a new or existing consolidated software inventory (CSI)
  3. Deciding on the number of RTEs needed and what type to configure
- Extending the basic configuration to other systems.

The IBM Tivoli Decision Support for z/OS monitoring agent address space can be configured to report through any Tivoli Enterprise Monitoring Server.

Requirements for z/OS systems where monitoring agents are deployed

The IBM Tivoli Decision Support for z/OS monitoring agent can be deployed on any z/OS system that is capable of running z/OS Version 1 Release 7 or higher.

You must also ensure that you have adequate direct access storage device (DASD) space to accommodate the products you are installing. During normal SMP/E processing, VSAM control interval and control area splits can occur. This causes fragmentation, which can degrade SMP/E performance and DASD space utilization. Monitor your SMP/E CSI library regularly to determine how many splits have occurred and the amount of free space remaining. To reorganize the CSI, use your site's approved utility and method for managing VSAM files. For more information about CSIs, see “Shared consolidated software inventory (CSI) considerations.”

The newest releases of IBM Tivoli Monitoring products are expected to be installed into shared libraries. If you are installing from a product tape, the DOCFILE on the product tape includes member (DASDINFO) which contains detailed information on the product libraries. The *Program Directory* for the IBM Tivoli Decision Support monitoring agent contains the approximate DASD space requirements for IBM Tivoli Decision Support monitoring agent. Be aware that those estimates presuppose that these products were installed in separate CSI environments. When multiple products are installed into a shared CSI environment, DASD requirements for each product should be less.

Before installing the monitoring agent, review the space requirements and considerations for an SMP/E installed environment to make sure that sufficient DASD storage is available.

Shared consolidated software inventory (CSI) considerations

To effectively manage a suite of IBM Tivoli products, install products into a shared consolidated software inventory (CSI) whenever possible. While most of the IBM Tivoli z/OS-based products coexist in a shared CSI, IBM cannot guarantee that these products coexist in the same installation environment with products from other vendors.

If you install a product into an existing CSI that contains a previous version of the same product, SMP/E deletes the previous version during the installation process. To maintain multiple product versions concurrently, they must be installed into separate CSIs.

Consider the following situations when using a shared CSI:

A Shared CSI eliminates duplication:
DASD space requirements can be reduced 75% by installing products into a shared CSI, as many IBM Tivoli Monitoring products share components that must be duplicated if different target and distribution zones are used.

Managing IFREQ situations:
Sharing a common set of zones allows SMP/E to automatically manage IFREQ situations that exist across product components. Otherwise, these IFREQ situations must be managed manually by running SMP/E cross-zone reports. See the *IBM SMP/E for z/OS and OS/390 Reference* manual for information concerning cross-zone reports.

Specify high-level qualifier for libraries:
If you are installing into an existing shared CSI, pay particular attention to the common libraries that begin with DKAN and TKAN. The DKAN and TKAN libraries were allocated with secondary space allocation to allow them to expand as you install additional products or apply maintenance. However, if these libraries have already gone into multiple extents, you might not have sufficient extents available for any necessary expansion. If this situation occurs, you might receive errors during the installation process.

DASD storage considerations:
If you are installing into an existing shared CSI, pay particular attention to the common libraries that begin with DKAN and TKAN. The DKAN and TKAN libraries were allocated with secondary space allocation to allow them to expand as you install additional products or apply maintenance. However, if these libraries have already gone into multiple extents, you might not have sufficient extents available for any necessary expansion. If this situation occurs, you might receive errors during the installation process.

Performing the SMP/E installation of z/OS-based components

System Modification Program/Extended (SMP/E) is the basic tool for installing and maintaining software in z/OS systems and subsystems. It controls these changes at the element level by doing the following:

- Selecting the proper levels of elements to be installed from a large number of potential changes
- Calling system utility programs to install the changes
- Keeping records of the installed changes

SMP/E is an integral part of the installation, service, and maintenance processes for z/OS and OS/390 software products and product packages, such as CBPDO, ProductPac®, RefreshPac, and selective follow-on service for CustomPac. In addition, SMP/E can be used to install and service any software that is packaged in SMP/E system modification (SYSMOD) format.

SMP/E can be run either from batch jobs or from the Interactive System Productivity Facility/Program Development Facility (ISPF/PDF). You can use ISPF to query the SMP/E database, as well as to create and submit jobs to process SMP/E commands.

A Program Directory guides you through the SMP/E installation process. Every monitoring agent product is accompanied by a Program Directory. See the *Program*

Directory for the IBM Tivoli Decision Support for z/OS monitoring agent for specific installation information for this product.

Introducing the Configuration Tool

The bulk of the configuration for the Tivoli Decision Support for z/OS monitoring agent is performed using the Configuration Tool. The Configuration Tool was formerly named the Candle Installation and Configuration Assistance Tool, or CICAT. However, for current releases of zSeries monitoring agents (including the Tivoli Decision Support for z/OS monitoring agent), the tool is used for configuration only. These products are now installed by SMP/E.

The Configuration Tool creates and customizes all the runtime data sets, and creates the JCL to support the Tivoli Decision Support for z/OS monitoring agent software. If the Tivoli Enterprise Monitoring Server is installed on a z/OS system or if you select SNA as one of your communications protocols, the Configuration Tool also creates the VTAM major node member in SYS1.VTAMLST. The members have the started task name and major node name you specify during the configuration process.

If you restart the Configuration Tool, you can continue from the point of interruption. For information about supported levels of the SMP/E program and other related installation software, refer to the *Tivoli Decision Support for z/OS monitoring agent: Program Directory*.

Tip: Some Configuration Tool menus contain items that apply only to the former Candle products. On the Main Menu of the Configuration Tool (see Figure 7 on page 94), only options 1 (**Set up work environment**) and 3 (**Configure products**) apply to the Tivoli Decision Support for z/OS monitoring agent.

The Configuration Tool provides defaults wherever possible. These defaults are sufficient to complete the installation of products and maintenance. Change the defaults to reflect the needs of your enterprise. The tool operates in two modes:

Interactive mode
An ISPF panel-driven facility assists you in specifying parameters and tailoring jobs for configuring new products and new versions of products.

Batch facility
This creates a single batch job that you can use to build, configure, and load a runtime environment (RTE). This single job performs all of the same RTE processing as the interactive Configuration Tool. Batch mode is a simple and useful way of replicating RTEs to other z/OS systems.

Using the Configuration Tool

The Configuration Tool provides defaults for most fields and options. The defaults can be changed to values specific to your site.

Whenever possible, the Configuration Tool checks the values you specify and verifies that you have specified the required values. If the Configuration Tool detects an error or omission, it displays a short message.

Display requirements in ISPF

If you are using a 3270 Model 2 (24 x 80) display, you must turn off the predefined function (PF) keys so that the Configuration Tool panels are not truncated. To turn

off the predefined function keys, type PFSHOW on any ISPF command line and press **Enter** until the function keys are no longer displayed.

Restrictions of the Configuration Tool

The following restrictions apply to the Configuration Tool:

- The length of the high-level qualifier for the runtime libraries must be 26 characters or less.
- You cannot use the ISPF feature for edit recovery. If you enter the ISPF RECOVERY ON command, edits produce a recovery error message. Enter the RECOVERY OFF command to suppress the error messages.

Commands and function

You can use the following commands for navigation and display control in the Configuration Tool:

End key
Returns to the previous panel.

Enter key
Accepts the values you have specified and displays the next panel in the process.

HELP Displays information about a panel or the extended description for a message.

README Displays the README for the Configuration Tool.

README APP
Displays information about VTAM applids.

README ERR
Displays a list of CLIST error codes and descriptions (for both interactive and batch mode).

README SYS
Displays information about system variable support.

UTIL Displays the Installation Services and Utilities menu.

Online help for the Configuration Tool

Online help contains detailed information about using the Configuration Tool panels. To display help from any Configuration Tool panel, press the Help key (F1) or enter HELP on the command line.

You can also display help for the help. For example, you can display information about the command to use to return to the previous topic in the help system. To display the help for help from any help panel, press the Help key (F1) or enter HELP on the command line.

Chapter 7. Setting up and using the Configuration Tool

This chapter provides an overview of the configuration process for Tivoli Enterprise Monitoring Server and monitoring agents on z/OS operating systems. It also describes the steps required to set up the z/OS environment and the procedures for setting up the Configuration Tool, and the work environment that you use to configure the IBM Tivoli Decision Support for z/OS monitoring agent.

The Configuration Tool is not used for installation on z/OS operating systems, because installation is now performed by the SMP/E installation procedures defined in the *Program Directory* for the IBM Tivoli Decision Support for z/OS monitoring agent. The Configuration Tool is now used for configuration only. Most of the configuration for the Tivoli Enterprise Monitoring Server on z/OS operating system and for the IBM Tivoli Decision Support for z/OS monitoring agent are performed using the Configuration Tool.

The Configuration Tool operates in the following modes:

Interactive mode
: where an ISPF panel-driven facility assists you in specifying parameters and tailoring jobs for configuring new products and new versions of products.

Batch mode
: where you use a single batch job to build, configure, and load a runtime-environment (RTE). A runtime environment is a group of runtime libraries that provide an operational environment on a z/OS operating system. This single batch job performs all of the same RTE processing as the interactive Configuration Tool. Batch Mode is a simple and useful way of replicating RTEs to other z/OS operating systems.

Use the Configuration Tool in interactive mode first to configure the first system. Then use batch mode to clone and customize this configuration for all other z/OS operating systems.

The Configuration Tool provides default settings for fields and options wherever possible. These default settings should be sufficient to complete the installation of products and maintenance, but should be changed to reflect the needs of your enterprise.

Whenever possible, the Configuration Tool verifies that the values that you specify are valid. If the Configuration Tool detects an error or omission, a short error message is displayed.

Before you can create the basic configuration described in Chapter 8, “Setting up a basic configuration,” on page 101, start on the z/OS system where the Configuration Tool and the IBM Tivoli Decision Support for z/OS monitoring agent were installed using SMP/E, and set up the Configuration Tool.

If you have other IBM Tivoli Monitoring agents already installed, it is not necessary to setup the Configuration Tool. You can skip the procedures in this chapter.

If you have installed a new version of the Configuration Tool with SMP/E, then you must set up and start this new version. The following sections describe how to set up and start the Configuration Tool in either a new CSI or an existing CSI. These are the abbreviations for the high-level qualifiers:

Abbreviation	Description
&hilev	High-level qualifier
&thilev	SMP/E target high-level qualifier
&shilev	Installation high-level qualifier
&rhilev	RTE high-level qualifier
&svhilev	VSAM CSI high-level qualifier

Step 1: Initializing the Configuration Tool work library

Before starting the Configuration Tool, you must initialize the work library and copy the contents of the target library from the SMP/E installation location into a new work library. If you are using an existing Consolidated Software Inventory (CSI) that already has the Configuration Tool installed, copy the contents of the target library into your existing Configuration Tool library. The following sections describe how to initialize the work library in a new CSI or in an existing CSI. The CSI is a VSAM data set in which SMP/E maintains information about the system.

Step 1a: Initializing the Configuration Tool work library in a new Consolidated Software Inventory

Before starting the Configuration Tool in a new CSI, create and submit a JCL job to allocate a new Configuration Tool work library and copy the contents of the target library from the SMP/E installation location into this new work library. Use the following sample JCL:

1. Allocate the new &shilev.INSTLIB library:

```
//JOBCARD
//ALLOCDS EXEC PGM=IEFBR14
//*
//INSTLIB DD DSN=&shilev.INSTLIB,
// DISP=(NEW,CATLG,DELETE),
// UNIT=&tunit,
// VOL=SER=&tvol,
// DCB=(RECFM=FB,LRECL=80,BLKSIZE=8880),
// SPACE=(TRK,(90,15,132))
```

   Replace the following parameters with values that are specific to your environment.

   Where:

   - JOBCARD is your JOB card statement containing the account information appropriate to your environment for job submission, for example:

```
//userid
A JOB (ACCT),'NAME',CLASS=A, MSGCLASS=A, NOTIFY=&SYSUID
```

     Note: Including the NOTIFY option to the job card statement helps you to verify that each job completes successfully before continuing to the next configuration step.
   - &shilev is the installation environment high-level qualifier that you specified for the Configuration Tool.
   - &tunit is the disk unit type for the target library.

- &tvol is the disk volser for the target library.

2. Copy the contents of the &thilev.TKCIINST library into the &shilev.INSTLIB library. For example:

```
//COPY EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=*
//IN DD DSN=&thilev.TKCIINST,DISP=SHR
//OUT DD DSN=&shilev.INSTLIB,DISP=SHR
//SYSIN DD *
COPY O=OUT,I=((IN,R))
```

Where:

- &thilev is the SMP/E target high-level qualifier.
- &shilev is the installation high-level qualifier.

Submit the JCL job and verify that it completes with a return code of 0.

Step 1b: Initializing the Configuration Tool work library in an existing CSI

Before starting the Configuration Tool in an existing CSI, create and submit a JCL job to copy the contents of the &thilev.TKCIINST target library from the SMP/E installation location into the existing Configuration Tool &shilev.INSTLIBW work library. You might have to unlock the high-level qualifiers. See "Step 3: Unlocking high-level qualifiers for an existing consolidated software inventory" on page 94. Your JCL should look similar to the following example:

```
//COPY EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=*
//IN DD DSN=&thilev.TKCIINST,DISP=SHR
//OUT DD DSN=&shilev.INSTLIBW,DISP=SHR
//SYSIN DD *
COPY O=OUT,I=((IN,R))
```

Where:

- &thilev is the SMP/E target high-level qualifier.
- &shilev is the installation high-level qualifier you specified for the Configuration Tool.

Submit this JCL. The job should complete successfully with a return code of 0.

Step 2: Starting the Configuration Tool

After initializing the Configuration Tool work library, follow these steps to start the Configuration Tool and access the MAIN MENU panel:

1. Log on to a TSO session.
2. Start ISPF.
3. Go to a TSO command line (usually option 6 in the ISPF PRIMARY OPTION MENU panel).
4. Enter the following command, where `&shilev` is the high-level qualifier you specified for the Configuration Tool work library:

```
EX '&shilev.INSTLIB'
```

Note: When you start the Configuration Tool, you might be presented with a job that enables you to update the Configuration Tool environment. Run this job to ensure that you are running the latest version of the Configuration Tool.

Step 2: Starting the Configuration Tool

The Configuration Tool displays the copyright panel and then the MAIN MENU panel (see Figure 3 on page 9).

```
--------------------------------- MAIN MENU ----------------------------
OPTION===>

Enter the number to select an option:

1 Set up work environment

2 Install products or maintenance (for traditional Candle products only)

3 Configure products

I Installation information <=== Revised
S Services and utilities

Installation and Configuration Assistance Tool Version 310.06
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F1=Help F3=Back
```

Figure 7. Configuration Tool main menu

Step 3: Unlocking high-level qualifiers for an existing consolidated software inventory

When installing into an existing CSI, unlock the configuration environment high-level qualifiers to modify them as needed.

Use these steps to unlock and modify the configuration environment high-level qualifiers:

1. In the Configuration Tool **MAIN MENU** panel, select **S** (Services and utilities).
2. In the **INSTALLATION SERVICES AND UTILITIES** panel, select **1** (Unlock runtime high-level qualifiers).
3. In the **UNLOCK RUNTIME HIGH-LEVEL QUALIFIERS** panel, specify **Y** in the Unlock **Runtime high-level qualifiers** field.
4. Provide the appropriate values in the **SET UP CONFIGURATION ENVIRONMENT** panel, make your modifications to the high-level qualifiers and press **Enter**.
5. Press F3 until you return to the **MAIN MENU** panel.

Step 4: Setting up the work environment

Follow these steps to specify values that the Configuration Tool uses to control the configuration of products.

1. In the Configuration Tool MAIN MENU panel, select 1 (Set up work environment). The SET UP WORK ENVIRONMENT panel is displayed. This panel and its associated option panel provide operating values needed by the installation processor.
2. In the SET UP WORK ENVIRONMENT panel, select Specify options. The SPECIFY OPTIONS panel shown in Figure 8 on page 95 is displayed. This panel is used to specify allocation and processing values to create the work data sets that are needed for the Configuration Tool. This provides operational values for generating batch jobs.

```
------------------------------ SPECIFY OPTIONS -------------------------------
COMMAND ===>

Specify allocation and processing options:

JCL REGION value ==> 0M (Specify K/M suffix)

Unit/Storclas/
VolSer Mgmtclas PDSE

Installation work datasets ................ 3390 N
                                            R$US02

Specify the job statement for Installer-generated JCL:

==> //userid A JOB (ACCT),'NAME',CLASS=A, MSGCLASS=A, NOTIFY=&SYSUID
==> //* DEFAULT JCL
==> //*
==> //*


Enter=Next F1=Help F3=Back
```

Figure 8. Specify options for your work environment panel in the Configuration Tool

3. In the SPECIFY OPTIONS panel, review the allocation processing options. Accept the default values or specify values as needed for the options where the default values have not been provided. Use the following information to complete this panel:

   JCL REGION value
   SMP/E batch jobs contain the `REGION =` parameter on the `EXEC` statement The value of this parameter is taken from the CIGSMREG variable. Change this value as required by your installation. The default setting is `0M`.

   Unit Specify the unit name to be used when allocating the installation data sets. If the installation data sets are not to be SMS-managed, this field is required. If your installation does not use the unit name, or if it is optional, leave this field blank.

   Volser Specify the volume serial numbers to be used when allocating the installation data sets. If the installation data sets are not to be SMS-managed, this field is required. If your installation does not use the volume serial number or if it is optional, leave this field blank.

   Storclas
   If the installation data sets are to be SMS-managed, specify the SMS storage class to be used for allocation. If your installation does not use the SMS Storclas parameter, or if it is optional, leave this field blank.

   Mgmtclas
   If the installation data sets are to be SMS-managed, specify the SMS management class to be used for allocation. If your installation does not use the SMS Storclas parameter, or if it is optional, leave this field blank.

   PDSE If the installation data sets are to be SMS-managed, specify `Y` to allocate PDSE data sets instead of standard PDS data sets. Use the PDSE data sets.

   Note: Verify the following tasks before you allocate SMS-managed data sets:

- SMS is active on the z/OS operating system where the data sets are allocated.
- Specify a high-level qualifier that is eligible for SMS-managed volumes.
- Specify a combination of Unit/Volser and Storclas/Mgmtclas values that are valid in your environment.

SMS can be implemented in different ways so the Configuration Tool does not attempt to validate these parameters. The data set allocation jobs uses all parameters that you enter. If you are not allocating SMS-managed data sets, you must provide Volser and unit parameters as appropriate.

Job statement

Enter the standard job card that is used for each of the batch jobs that the Configuration Tool builds. This job card information is saved in the PROFILE pool for each user. Overwrite the following value to specify your own job statement:

```
//jobstatement
```

In this field, `jobstatement` is the JCL appropriate to your environment for job submission. Each input field represents one line of JCL.

Note: During the configuration process, you submit several jobs where the JCL is generated for you. By default, JCL generated by the installation does not include the NOTIFY option. However, if you add this option, verify that each job completes successfully before continuing to the next configuration step. The notation `CLASS=A, MSGCLASS=A, NOTIFY=&SYSUID` in Figure 8 on page 95 enables the NOTIFY option.

Press **Enter** to accept the specified work values and return you to the SET UP WORK ENVIRONMENT panel.

4. If you have finished setting up your installation environment, press F3 to return to the Configuration Tool **MAIN MENU** panel.

Step 5: Allocating work libraries

Follow these required steps to allocate the installation libraries and move the installation members, such as ISPF tables and jobs, to the appropriate library. You should allocate the installation libraries as PDSE.

1. In the **SET UP WORK ENVIRONMENT** panel, enter 2 (**Allocate work libraries**).

   This option generates a JCL job to allocate the Configuration Tool work libraries. The initial library, INSTLIB, contains both the operational code and the tables and jobs created by the installer. This job creates additional libraries and populates them with the data initially stored in the INSTLIB library.
2. Review the JCL and submit the job.
3. Exit the Configuration Tool and allow the job to run before restarting the Configuration Tool.
4. Verify that the job completes successfully with a return code of 0. Table 6 on page 97 lists the allocated libraries.

Table 6. Allocated libraries

Library	Description
INSTDATA	Retains various tables that the Configuration Tool creates and controls information loaded from the distribution media packages.
INSTDATW	Staging library that is loaded with control information from the distribution media. The Configuration Tool checks this library periodically for new packages and processes them into INSTDATA library, if necessary.
INSTJOBS	Saves the job streams created by the Configuration Tool.
INSTLIB	Contains the Configuration Tool executable code.
INSTLIBW	Staging library that is loaded with the latest version of the Configuration Tool executable code. The Configuration Tool checks this library periodically for new versions of executable code, and migrates the data set into &shilev.INSTLIB, library, if necessary.
INSTQLCK	Used to prevent concurrent updates to the same library.
INSTSTAT	Saves the job execution status of job streams generated by the Configuration Tool and submitted by you

Notes:

1. The Installation high-level qualifier defaults to the &shilev value you specified in the Checklist for Tape section of the installation documentation. For example, if you named your installation library as ABCDE.INSTLIB, then your installation high-level qualifier (&shilev) is ABCDE.
2. The default space allocations for the INSTDATA and INSTJOBS libraries are sufficient for typical installations. However, the size of the libraries grows as the number of runtime environments and the number of applications configured in them grows. If you are planning on having dozens of runtime environments, each of which contain multiple products, you should review the space allocations and increase them accordingly.
3. If you choose not to submit any of the JCL jobs while you are running the Configuration Tool by cancelling out of them, the jobs are stored in the &shilev.INSTJOBS library and you can submit them outside of the Configuration Tool.
4. Restart the Configuration Tool and continue to set up your configuration environment.

Step 6: Setting up your configuration environment

Setting up the configuration environment involves specifying the values that the Configuration Tool uses to customize the JCL that it creates. Follow these steps to set up your configuration environment:

1. In the Configuration Tool MAIN MENU panel, enter 3 (Configure products). The CONFIGURE PRODUCTS panel shown in Figure 9 on page 98 is displayed.

```
------------------------------ CONFIGURE PRODUCTS -----------------------------
OPTION ===>

Enter the number to select an option:

1 Set up configuration environment

2 Select product to configure

I Configuration information <=== Revised
S Services and utilities



F1=Help F3=Back
```

Figure 9. Configuration Tool configure products menu

2. Enter **1 (Set up configuration environment)**. The **SET UP CONFIGURATION ENVIRONMENT** panel shown in Figure 10 is displayed. The values entered in this panel are used to customize the JCL that is created by the Configuration Tool. The Configuration Tool is designed to configure products in multiple RTEs.

```
---------------------- SET UP CONFIGURATION ENVIRONMENT ----------------------
COMMAND ===>

*** High-level qualifiers are locked.

RTE allocation routine ==> IKJEFT01 (IKJEFT01/IEFBR14)

Runtime                                  Unit/              Storclas/
Datasets       High-Level Qualifier      VolSer             Mgmtclas     PDSE
VSAM           &hilev                    3390

Non-VSAM       &hilev                    3390                            N
                                         R$US02
Work   ..............................    3390


SMP/E
Datasets       High-Level Qualifier
Target         &hilev



Enter=Next  F1=Help  F3=Back
```

Figure 10. Configuration Tool set up configuration environment panel

In this figure, `&hilev` is the name of your high-level qualifier, for example, `KDO.INSTLIB`.

Note: If you enter the configuration environment information panel again after specifying values, the high-level qualifiers are locked and cannot be modified. If you must modify these values for some reason, see "Step 3: Unlocking high-level qualifiers for an existing consolidated software inventory" on page 94 for more information or use the **Unlock runtime high-level qualifiers** option in the CONFIGURATION SERVICES AND UTILITIES panel.

For further help, press F1.

This panel includes the following options:

RTE allocation routine
The allocation steps that the Configuration Tool generates for the runtime environments are designed to use one of following techniques:

- Batch TMP in which the JCL that is generated creates a CLIST using a temporary data set and then executes that CLIST to create the libraries. This process ensures that the JCL is resubmitted without change and does not fail with JCL errors. This is the recommended method.
- DD allocation in which the JCL that is generated uses DD statements. If the step requires a re-submission, you must first modify the JCL to eliminate DD statements for data sets that have already been allocated.

Unit Specify the unit name to be used when allocating the runtime data sets. This field is required if the runtime data sets are not to be SMS-managed. If your installation does not use the unit name or if it is optional, leave this field blank.

Volser Specify the volume serial numbers to be used when allocating the runtime data sets. This field is required if the runtime data sets are not to be SMS-managed. If your installation does not use the volume serial number or if it is optional, leave this field blank.

Storclas
If the runtime data sets are to be SMS-managed, specify the SMS storage class to be used for allocation. If your installation does not use the SMS Storclas parameter, or if it is optional, leave this field blank.

Mgmtclas
If the runtime data sets are to be SMS-managed, specify the SMS management class to be used for allocation. If your installation does not use the SMS Storclas parameter, or if it is optional, leave this field blank.

PDSE If the runtime data sets are to be SMS-managed, specify **Y**to allocate PDSE data sets instead of standard PDS data sets. It is recommended to use PDSE.

SMP/E Datasets Target
Enter the high-level qualifier of your SMP/E target data sets (*&hilev*). All SMP/E target data sets must have the same high-level qualifiers if they are to part of this configuration.

After you have provided or confirmed these values, press **Enter**. You are returned to the **CONFIGURE PRODUCTS** panel. Press F3 again, to return to the Configuration Tool **MAIN MENU** panel. You have completed setup of the configuration and work environments. You are ready to continue and create your configuration. Chapter 8, “Setting up a basic configuration,” on page 101 describes a basic configuration that you can create or adapt for your environment.

Chapter 8. Setting up a basic configuration

Given the supported operating systems and z/OS address spaces, there are several distinct ways that you might deploy the IBM Tivoli Decision Support for z/OS Monitoring Agent into your established IBM Tivoli Monitoring environment. This chapter uses a basic configuration that you can implement as a test deployment in an IBM Tivoli Monitoring environment. It describes the steps to configure IBM Tivoli Decision Support for z/OS Monitoring Agent when you have the Tivoli Enterprise Monitoring Server and the Monitoring Agent in different address spaces on the same z/OS operating system as shown in Figure 11.

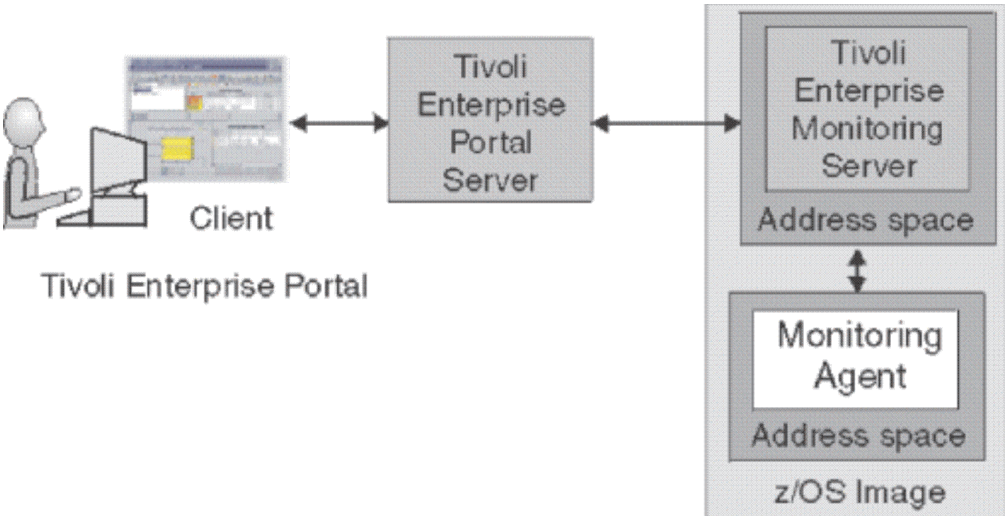

Figure 11. A local configuration with Tivoli Enterprise Monitoring Server and the Monitoring Agent on the same z/OS operating system

The basic configuration reflects the following planning recommendations:

- Configure a hub Tivoli Enterprise Monitoring Server on the z/OS operating system. Run the Tivoli Enterprise Monitoring Server on the z/OS operating system in the same system or LPAR as the Configuration Tool. This configuration usually achieves the most efficient balance between the processing throughput required by the Monitoring Agent and the number of agents. This arrangement is also best for disaster recovery.
- Run the Tivoli Enterprise Monitoring Server on the z/OS operating system in a different address space from the Monitoring Agent.
- Create a single runtime environment (RTE) for both the Tivoli Enterprise Monitoring Server and the Monitoring Agent. You might prefer to create two separate RTEs for the Tivoli Enterprise Monitoring Server and the Monitoring Agent for easier maintenance (for example, you might want to upgrade the Tivoli Enterprise Monitoring Server without disturbing the configuration of the Monitoring Agent). The disadvantage of this deployment is that it requires more DASD space.

This procedure involves the following steps:

- "Step 1: Creating a runtime environment" on page 102
- "Step 2: Configuring a hub Tivoli Enterprise Monitoring Server" on page 107

Step 1: Creating a runtime environment

In this basic configuration, create an RTE to contain the IBM Tivoli Decision Support for z/OS Monitoring Agent. The steps that follow explain how to create this RTE. This RTE is created as a FULL RTE which contains both base and private libraries.

Step 1a: Adding a new runtime environment

Follow this procedure to add a new runtime environment:

1. In the **MAIN MENU** panel of the Configuration Tool, select **3** (Configure products).
2. In the **CONFIGURE PRODUCTS** panel, as shown in Figure 9 on page 98, select **2** (**Select product to configure**).

   The **PRODUCT SELECTION MENU** panel is displayed, as shown in Figure 12. Only those packages that are eligible to be configured are listed in this panel. Select only one product at a time for configuration.
3. Enter S in the **Actions** field next to **IBM Tivoli Decision Support for z/OS V1.8.0 or V1.8.1**.

```
---------------------------- PRODUCT SELECTION MENU ----------------------------
COMMAND ===>

Actions: S Select product .

S IBM Tivoli Decision Support for z/OS V1.8.0
  IBM Tivoli Monitoring Services on z/OS V6.1.0
  IBM Tivoli OMEGAMON XE for CICS on z/OS V4.1.0
  IBM Tivoli OMEGAMON XE for DB2 Performance Expert on z/OS V4.1.0
  IBM Tivoli OMEGAMON XE for IMS on z/OS V4.1.0
  IBM Tivoli OMEGAMON XE for Mainframe Networks V1.4.0
  IBM Tivoli OMEGAMON XE for Storage on z/OS V4.1.0

F1=Help F3=Back F5=Refresh F7=Up F8=Down
```

Figure 12. Configuration Tool product selection menu

4. The **RUNTIME ENVIRONMENTS (RTEs)** panel is displayed, as shown in Figure 13 on page 103. The supported actions available for RTEs are listed on this panel. To create a new RTE, use the add (A), build (B), configure (C), and load (L) actions for each RTE that contains the selected product. If this is a new installation, no RTEs are defined on this panel, otherwise previously defined RTEs are displayed on this panel.

```
------------------------ RUNTIME ENVIRONMENTS (RTEs) -------------------------
COMMAND ===>

Actions: A Add RTE, B Build libraries, C Configure,
         L Load all product libraries after SMP/E,
         D Delete, U Update, V View values, Z Utilities

Action Name     Type Sharing Description

   A   BasicTDS FULL         RTE for the basic configuration

Enter=Next F1=Help F3=Back F7=Up F8=Down
```

Figure 13. Configuration Tool runtime environments panel

In this example, an RTE named `BasicTDS` is created as a FULL type RTE. This RTE has all of the base and private libraries included in one RTE. Enter the following information in the **RUNTIME ENVIRONMENTS (RTEs)** panel:

- In the **Action** field, type **A** to add a new RTE.
- In the **Name** field, type a name for a new RTE (for example, `BasicTDS`). The name is a unique identifier (up to 8 characters), automatically used as the mid-level qualifier for FULL and SHARING RTEs. You can optionally specify a mid-level qualifier for BASE RTEs.
- In the **Type** field, type `FULL` to designate this RTE as a FULL RTE. These are the valid RTE types:

FULL Allocates both private and base libraries. Use this if only one RTE is defined for your environment, or if you add an RTE for a unique set of products.

Because this is a FULL RTE and is not sharing base files with another RTE, leave the **SHARING** field blank. If you were creating a SHARING RTE, you would enter the name of the BASE or FULL RTE from which this SHARING RTE obtains its base library information. If SMP/E target libraries are to be shared, type **SMP**.

BASE Allocates base libraries only, and does not run alone. Use this only in conjunction with SHARING RTEs populated with the same products. If you intend to add other runtime environments using SHARING RTEs, you should create a BASE type first.

Note: You cannot configure products in a BASE RTE.

SHARING
Allocates private libraries only. This type shares base libraries with a BASE or FULL RTE type populated with the same products, or uses SMP/E target libraries for its base libraries. If you have multiple operating systems, define one SHARING RTE for each z/OS operating system.

- In the **Description** field, type a short text description for this RTE.
- Press **Enter** to add the definition of the RTE to the Configuration Tool.

After specifying all required values in the **RUNTIME ENVIRONMENTS (RTEs)** panel, press **Enter** to continue and display the first of two **ADD RUNTIME ENVIRONMENT** panels.

Step 1b: Specifying values on ADD RUNTIME ENVIRONMENT panels

The Configuration Tool uses the configuration parameter values that you specify on these additional panels to customize the JCL that is built for you.

Note: If you enter this panel again after you specify the values, the high-level qualifiers are locked and cannot be modified. If you must modify these values for some reason, see "Step 3: Unlocking high-level qualifiers for an existing consolidated software inventory" on page 94.

Follow these steps to specify values to define your runtime environment:

1. In Figure 14, specify values to define the runtime environment.

```
----------------------- ADD RUNTIME ENVIRONMENT (1 of 2) ----------------------
COMMAND ===>

RTE: BASICTDS Type: FULL Desc: RTE for the basic configuration

Libraries  High-level Qualifier  Volser             Unit  Storclas  Mgmtclas  PDSE
Non-VSAM   hilev                 R$US02             3390                      N
VSAM       hilev                 R$US02
Mid-level qualifier ==> BASICTDS

JCL suffix        ==>              Remote RTE for transport ==> N  (Y, N)
STC prefix        ==> CANS         Runtime members analysis ==> Y  (Y, N)
SYSOUT class      ==> X            Diagnostic SYSOUT class  ==> X
Load optimization ==> N (Y, N)

Will this RTE have a Tivoli Enterprise Monitoring Server       ==> Y (Y, N)
If Y, TEMS name ==> name:CMS (Case sensitive)

Copy configuration values from RTE ==> (Optional)



Enter=Next F1=Help F3=Back
```

Figure 14. Configuration Tool add runtime environment panel (1 of 2)

In this panel, enter your JCL suffix and optionally change the STC prefix. Because this sample basic configuration includes the Tivoli Enterprise Monitoring Server in this RTE, ensure that the response to **Will this RTE have a Tivoli Enterprise Monitoring Server** is **Y**. Press F1 for further help.

Note: The full Tivoli Enterprise Monitoring Server name has a suffix of CMS. When seeding the Tivoli Enterprise Monitoring Server later you need the full name, including the RTE name, for example, BasicTDS:CMS.

Use the following information to complete this panel:

- **Non-VSAM libraries**
  - Type the high-level qualifier.
  - Type valid values for your enterprise for either the Volser/Unit parameters or the Storclas/Mgmtclas parameters.
  - Indicate whether PDSE libraries are to be used.
  - PDSEs do not require compression, and are not limited by a predefined number of directory entries. The default setting of N signifies that PDSE libraries are to be used.

    Note: Supply SMS values for libraries specified as PDSEs.

- **VSAM libraries**
  - Type the high-level qualifier.
  - Type valid values for your enterprise for the Volser or the Storclas/Mgmtclas parameters.
- **Mid-level qualifier**
  - For FULL and SHARING RTEs, accept the mid-level qualifier default value (which is the RTE name you previously specified) or specify a unique mid-level qualifier.
  - For BASE RTEs, specify a unique mid-level qualifier or optionally leave this field blank.
- **JCL suffix**

  Type a unique suffix for the JCL. The suffix (up to four characters) is appended to all JCL that is generated in the INSTJOBS library. The JCL suffix uniquely identifies the batch job members created by the Configuration Tool for this RTE.
- **STC prefix**

  For a FULL or SHARING RTE, type a global STC Prefix (from one to four characters) to be used in building started task names for products in this RTE, or accept the default setting of CANS.
- **SYSOUT class**

  Specify the value for non-diagnostic output DD statements, for example, RKPDLOG in the generated JCL. This replaces the previously hardcoded SYSOUT class value.
- **Diagnostic SYSOUT class**

  Specify the value for diagnostic output DD statements, for example, SYSDUMP in the generated JCL. This replaces the previously hardcoded SYSOUT class value. The default setting is X.
- **Load optimization**

  Indicate whether you want to optimize loading of this RTE. The default setting is N. Press F1 for further help.

  Note: The first load performed after you enable this feature copies all members to the runtime data sets. Load optimization is effective on the second and subsequent load operation.
- **Will this RTE have a Tivoli Enterprise Monitoring Server**

  This applies only to FULL or SHARING RTEs. Because this example configuration has a hub Tivoli Enterprise Monitoring Server, enter **Y**. The default setting of **Y** allocates Tivoli Enterprise Monitoring Server libraries.

  You must enter the name of the Tivoli Enterprise Monitoring Server to be configured. It is used by the other components that have to communicate with this Tivoli Enterprise Monitoring Server. The name of the RTE is used as the default setting.
- **Copy configuration values from RTE**

  This is optional and applies only to FULL or SHARING RTEs. Type the name of an existing RTE, from which configuration values are copied and used for this RTE. For this example configuration, leave this blank.

  Note: This procedure makes an exact copy of the existing RTE. If you are not using the same products in the new RTE, do not use this option.

  After specifying all required values in the **ADD RUNTIME ENVIRONMENT (1 of 2)** panel, press **Enter**.

2. Figure 15 is displayed:

```
---------------------- ADD RUNTIME ENVIRONMENT (2 of 2) ----------------------
COMMAND ===>

Use z/OS system variables?   ==> N (Y, N)
RTE name specification       ==> Your_system_name
RTE base alias specification ==>                        n/a
Applid prefix specification  ==> Your_prefix
Use VTAM model applids?      ==> N (Y, N)

Security system    ==> NONE (RACF, ACF2, TSS, NAM, None)
ACF2 macro library ==>

If you require VTAM communications values for this RTE, complete these values:
Applid prefix ==> CTD Network ID         ==>
Logmode table ==> KDSMTAB1 LU6.2 logmode ==> CANCTDCS

If you require TCP/IP communications for this RTE, complete these values:
*Hostname           ==>                              * (See F1=Help for
*Address            ==>                                 HOMETEST instructions)
Started task        ==>      (Recommended default = *)
Port number         ==>
Interlink subsystem ==> (if applicable)

Enter=Next F1=Help F3=Back
```

Figure 15. Configuration Tool add runtime environment 2 of 2 panel

Much of the information required by this panel (for example, the values shown as Your_system_name and Your_prefix in the above figure) are filled in already from the previous Configuration Tool panels. In this **ADD RUNTIME ENVIRONMENT (2 of 2)** panel, for FULL and SHARING RTEs only, specify these values:

- **Use z/OS system variables?**

  Specify **Y** if this RTE uses z/OS operating system variables. See the section 'Enabling system variable support,' at the end of this chapter for more information on enabling system variable support. The default setting is **N**.

- **Security system**

  Specify what, if any, security system is to be used for this RTE. The default setting is **NONE**. If ACF2 is specified, you must also type the name of the ACF2 macro library..

- **VTAM communication values**
  - Type a global VTAM applid prefix (from one to four characters) to be used in building the VTAM applids for products in this RTE. The default setting is **CTD**.
  - Identify your VTAM network. This is defined in the NETID parameter of VTAMLST.
  - Type the Logmode table name for LU6.2 logmode entries. The default setting is **KDSMTAB1**.
  - Type the LU6.2 logmode for this RTE. The default setting is **CANCTDCS**.
- **TCP/IP communication values**
  - Type the TCP/IP host name of the z/OS operating system in which this RTE resides and the TCP/IP address of the host. Enter this command on the z/OS operating system where this RTE runs to get the host name and address values:

    ```
    TSO HOMETEST
    ```

    Enter the host name exactly as it appears in the command response.

- Type the started task name of the TCP/IP address space.

  For an existing runtime environment, the default value is the true TCP/IP started task name. A new runtime environment uses the default wild card character asterisk (*) for the TCP/IP started task name. If possible, you should keep the default wildcard character. If the IP domain name resolution is not fully configured on the z/OS operating system, an additional DD statement is required for product operation.
- Type the address of the IP port. Use the default value of **1918**or specify another unused port suitable for your environment.

After specifying all required values on this panel, press **Enter**. You are returned to Figure 16.

Optional: Select **V** (**View values**) to verify the RTE information and **U** (**Update**) to make any necessary changes.

Step 1c: Building runtime libraries

Before running this step you should have added an RTE to your system. You must run this procedure before configuring your product.

Follow these steps to build the runtime libraries.

1. In the **MAIN MENU** panel of the Configuration Tool, select 3 (**Configure products**).
2. In the **CONFIGURE PRODUCTS** panel, select 2 (**Select product to configure**).
3. In the **PRODUCT CONFIGURATION SELECTION MENU** panel, select **IBM Tivoli Decision Support for z/OS V1.8.0 or V1.8.1**.
4. The **RUNTIME ENVIRONMENTS (RTEs)** panel is displayed, as shown in Figure 16.

```
------------------------ RUNTIME ENVIRONMENTS (RTEs) ------------------------
COMMAND ===>

Actions: A Add RTE, B Build libraries, C Configure,
         L Load all product libraries after SMP/E,
         D Delete, U Update, V View values, Z Utilities

Action Name     Type Sharing Description

   B   BasicTDS FULL         RTE for the basic configuration

Enter=Next F1=Help F3=Back F7=Up F8=Down
```

Figure 16. Configuration Tool runtime environments panel for build operation

5. Build the runtime libraries. Enter **B** in the **Action** field next to the `BasicTDS` RTE that you are creating and press **Enter**.
6. Review the JCL that is displayed. You might want to change the job name match the member name so you can easily identify the jobs at a later date.
7. Submit the job and verify that the job completes successfully with a return of 0.
8. Press F3 to return to the **RUNTIME ENVIRONMENTS (RTEs)** panel.

Step 2: Configuring a hub Tivoli Enterprise Monitoring Server

You must first configure the Tivoli Enterprise Monitoring Server *before* configuring the monitoring agents that communicate with the Tivoli Enterprise Monitoring Server. You can place this server on any of the supported distributed or z/OS operating system environments.

Step 2: Configuring a hub Tivoli Enterprise Monitoring Server

To install and configure the Tivoli Enterprise Monitoring Server on a z/OS system, refer to the IBM Tivoli Monitoring: Configuring Tivoli Enterprise Monitoring Server on z/OS publication.

To install and configure the Tivoli Enterprise Monitoring Server on a distributed system, refer to the IBM Tivoli Monitoring: Installation and Setup Guide.

Step 3: Configuring the monitoring agent

This topic describes the procedures that are necessary to configure a monitoring agent and link it to the Tivoli Enterprise Monitoring Server that is in the same z/OS operating system.

1. In the **MAIN MENU** panel of the Configuration Tool, select **3** (**Configure products**).
2. In the **CONFIGURE PRODUCTS** panel, select **2** (**Select product to configure**).
3. In the PRODUCT SELECTION MENU panel, type **S** next to **IBM Tivoli Decision Support for z/OS V1.8.0**. The **RUNTIME ENVIRONMENTS (RTEs)** panel is displayed.
4. In the **RUNTIME ENVIRONMENTS (RTEs)** panel, enter **C** in the **Action** field next to the runtime definition. The **PRODUCT COMPONENT SELECTION MENU** panel is displayed, as shown in Figure 17:

```
---------------------- PRODUCT COMPONENT SELECTION MENU -----------------------
COMMAND ===>

The following list of components requires configuration to make the
product operational. Refer to the appropriate configuration documentation if you
require additional information to complete the configuration.

To configure the desired component, enter the selection number on the
command line. You should configure the components in the order they are listed.

Note: It may not be necessary to configure Tivoli Enterprise Monitoring Server
      (TEMS) component, if listed below. Press F1 for more information.

   COMPONENT TITLE

1  Tivoli Enterprise Monitoring Server
2  IBM Tivoli Decision Support for z/OS Agent
```

Figure 17. Product component selection menu in the Configuration Tool

5. Select **2** (IBM Tivoli Decision Support for z/OS Agent). The **Configures IBM Tivoli Decision Support for z/OS / RTE:** panel is displayed, as shown in Figure 18 on page 109.

```
------ Configure IBM Tivoli Decision Support for z/OS / RTE: BASICTDS -----
OPTION ===>

                                                          Last selected
Perform the appropriate configuration steps in order:     Date     Time

I  Configuration information (What's New)

1  Specify Agent configuration parameters

If you have defined a TEMS in this RTE that this Agent
will communicate with, select option 1.
   2 Register with local TEMS

3 Specify Agent address space parameters
4 Create runtime members

5 Complete the configuration

Note: Press F5=Advanced to configure to run in the TEMS address space.



F1=Help  F3=Back  F5=Advanced
```

Figure 18. Configure IBM Tivoli Decision Support for z/OS/ RTE: panel in the Configuration Tool

Select each one of these options in the order shown, and complete the configuration steps as described in the following sections.

Step 3a: Specifying Agent configuration parameters

In the **Configure IBM Tivoli Decision Support for z/OS / RTE:** panel, select **1** (Specify Agent configuration parameters). The **SPECIFY AGENT CONFIGURATION PARAMETERS** panel shown in Figure 19 is displayed.

```
KDO18P2 ----------------- SPECIFY CONFIGURATION VALUES ------------------------
Command ===>

 Specify the following Tivoli Decision Support (TDS) and DB2 parameters:
   DB2 subsystem name              ==> DSN
   DB2 plan name for TDS           ==> DRLPLAN
   DB2 maximum rows from SQL query ==> 10000
   Load library:
     DB2 (DSNLOAD) ==> DSN.DB2.LOADLIB
     TDS for z/OS  ==> DSN.TDS.LOADLIB

 Specify the global TDS prefix or the table-specific prefix:
   Global table prefix:
     TDS data          ==> DRL
   Table-specific table prefix:
     CICS              ==>             Job/Step Accounting ==>
     Coupling Facility ==>             Logical Partition   ==>
     DB2               ==>             System              ==>
     Device            ==>             TCPIP               ==>
     DFSMS             ==>             Workload            ==>
     IMS               ==>             zLinux              ==>

 Enter=Next  F1=Help  F3=Back
```

Figure 19. Specify agent configuration parameters panel in the Configuration Tool

Use this panel to specify the parameters required by the Tivoli Decision Support for z/OS monitoring agent to connect to the Tivoli Decision Support for z/OS DB2 database. Defaults will be displayed, however they will need to be modified to reflect your Tivoli Decision Support for z/OS and DB2 installation. Note that for the DB2 table prefix, either a global prefix needs to be entered which will be used

for data retrieval from all Tivoli Decision Support for z/OS tables, or individual DB2 table prefixes need to be entered for each attribute group. Any value contained in the global DB2 prefix will be used ahead of any values placed in the table-specific prefixes.

DB2 subsystem name
This is the DB2 Subsystem name of the Tivoli Decision Support for z/OS database. This required field can be 4 alphanumeric characters. The first character must be alphabetic.

DB2 plan name for TDS
This is the DB2 plan name for program DRLPSQLX. The plan name is specified when Tivoli Decision Support for z/OS is installed. The default value is DRLPLAN.

DB2 maximum rows from SQL query
This is the maximum number of rows to return from a single DB2 SQL statement. This parameter can be used to restrict the quantity of data returned by DB2. The default value is 10000.

DB2 for z/OS loadlib DSN
This is the Tivoli Decision Support for z/OS load module data set. This required field can be up to 44 alphanumeric characters, and specifies the dsname of the SMP/E target library data set into which the Tivoli Decision Support for z/OS load modules were installed.

Tivoli Decision Support for z/OS loadlib DSN
This is the DB2 for z/OS load module data set. This required field can be up to 44 alphanumeric characters, and specifies the dsname of the SMP/E target library data set into which the DB2 for z/OS load modules were installed.

Global table prefix: TDS data
This is the global DB2 table prefix for the Tivoli Decision Support for z/OS data tables. If this value is specified, then the same value applies to the rest of the table-specific prefix values. Each prefix field can be 8 alphanumeric characters. The first character must be alphabetic. Each value is customized when Tivoli Decision Support for z/OS is installed. The default prefix value is DRL.

Note that the global TDS prefix is mutually exclusive with the table-specific prefixes. Either specify the global prefix or specify all 12 table-specific prefixes (detailed below).

Table-specific table prefix: CICS
This is the DB2 table prefix for the Tivoli Decision Support for z/OS data tables for the CICS monitoring component.

Table-specific table prefix: Coupling Facility
This is the DB2 table prefix for the Tivoli Decision Support for z/OS data tables for the z/OS Performance Management (MVSPM) component.

Table-specific table prefix: DB2
This is the DB2 table prefix for the Tivoli Decision Support for z/OS data tables for the DB2 component.

Table-specific table prefix: Device
This is the DB2 table prefix for the Tivoli Decision Support for z/OS data tables for the z/OS System (MVS) component.

Table-specific table prefix: DFSMS
This is the DB2 table prefix for the Tivoli Decision Support for z/OS data tables for the DFSMS component.

Table-specific table prefix: IMS
This is the DB2 table prefix for the Tivoli Decision Support for z/OS data tables for the IMS CSQ Collect component.

Table-specific table prefix: Job/Step Accounting
This is the DB2 table prefix for the Tivoli Decision Support for z/OS data tables for the z/OS Interval Job/Step Accounting component.

Table-specific table prefix: Logical Partition
This is the DB2 table prefix for the Tivoli Decision Support for z/OS data tables for the z/OS System (MVS) component.

Table-specific table prefix: System
This is the DB2 table prefix for the Tivoli Decision Support for z/OS data tables for the z/OS System (MVS) component.

Table-specific table prefix: TCPIP
This is the DB2 table prefix for the Tivoli Decision Support for z/OS data tables for the TCP/IP for z/OS component.

Table-specific table prefix: Workload
This is the DB2 table prefix for the Tivoli Decision Support for z/OS data tables for the z/OS System (MVS) component.

Table-specific table prefix: zLinux
This is the DB2 table prefix for the Tivoli Decision Support for z/OS data tables for the Linux on zSeries component.

After you have entered this information, press **Enter** to return to the Configure IBM Tivoli Decision Support for z/OS / RTE: panel.

Step 3b: Registering with the local Tivoli Enterprise Monitoring Server

This step generates a JCL job that you submit to register the IBM Tivoli Decision Support for z/OS monitoring agent to the local Tivoli Enterprise Monitoring Server on the z/OS operating system. To register with the local Tivoli Enterprise Monitoring Server, complete the following steps:

1. In the **Configure IBM Tivoli Decision Support for Z/OS / RTE:** panel, select 2 (**Register with local TEMS**) and press **Enter**.

   A JCL job is generated and displayed for you to review.
2. Review this JCL and submit the job. The job should complete successfully with a return code of 0.

   When the job completes, you are returned to the **Configure IBM Tivoli Decision Support for z/OS / RTE:** panel shown in Figure 18 on page 109.

Step 3c: Specifying agent address space parameters

The **SPECIFY AGENT ADDRESS SPACE PARAMETERS** panel shown in Figure 20 on page 112 is used to specify the values for the agent address space parameters where the monitoring agent is to run in your enterprise, and the communication protocol priority sequence for the monitoring agent to connect with the Tivoli Enterprise Monitoring Server.

To specify these parameters, complete the following steps:

Step 3c: Specifying agent address space parameters

1. In the **Configure IBM Tivoli Decision Support for z/OS / RTE:** panel, select **3** (**Specify agent address space parameters**) and press **Enter**. The **SPECIFY AGENT ADDRESS SPACE PARAMETERS** panel shown in Figure 20 is displayed.

```
-------------------- SPECIFY AGENT ADDRESS SPACE PARAMETERS ------------------
COMMAND ===>

 The following information is needed to define the Agent address space.
  Agent started task             ==> CANSDO
  Connect to TEMS in this RTE    ==> N         (Y, N)
     Name of Primary TEMS        ==> None

  Specify the communication protocols in priority sequence.
     IP.PIPE   ==>    (Non-secure NCS RPC)
     IP.UDP    ==>    (Non-secure NCS RPC)
     SNA.PIPE  ==>    (Non-secure NCS RPC)
     IP6.PIPE  ==>    (IP.PIPE for IPV6)
     IP6.UDP   ==>    (IP.UDP for IPV6)
     IP.SPIPE  ==>    (Secure IP.PIPE)
     IP6.SPIPE ==>    (Secure IP.PIPE for IPV6)

     Note:  Enable only protocol(s) in use by the Primary TEMS.



 Enter=Next  F1=Help  F3=Back  F5=Advanced  F10=CMS List
```

Figure 20. Specify agent address space parameters panel in the Configuration Tool

Provide the following information to complete this panel:

Agent started task
Specify the started task name for the agent. This started task must be copied to your system procedure library at a later time. The default setting is **CANSDO**.

Connect to TEMS in this RTE
Type **Y** if you want to connect to a Tivoli Enterprise Monitoring Server already configured in the RTE. This is the default setting when a Tivoli Enterprise Monitoring Server is detected in the RTE. To select a different primary Tivoli Enterprise Monitoring Server to connect to, type **N** and then press **F10=CMS List**

The Configuration Tool displays the COMMUNICATION SELECTION panel with a list of Tivoli Enterprise Monitoring Servers. The initial list is derived from local and non-local z/OS Tivoli Enterprise Monitoring Servers configured in this *&shilev*.INSTLIB library. They are defined in this RTE or another RTE that is accessible to this installation library.

The monitoring agent connects to any Tivoli Enterprise Monitoring Server that runs on any operating system. This Tivoli Enterprise Monitoring Server pertains to the following conditions:

- A Tivoli Enterprise Monitoring Server defined in another INSTLIB library that is not accessible to this *&shilev*.INSTLIB installation library.
- A Tivoli Enterprise Monitoring Server defined in another operating system (non-z/OS operating system).

If the preferred primary Tivoli Enterprise Monitoring Server resides in another INSTLIB library or in another operating system, then in the **COMMUNICATION SELECTION** panel, press **F5=Advanced** to

navigate to the **ADVANCED CONFIGURATION VALUES** panel to specify the following configuration options:

- Enable a secondary Tivoli Enterprise Monitoring Server
- Enable startup console messages
- Enable WTO messages
- Specify storage detail logging intervals
- Specify flush VSAM buffer intervals
- Specify the minimum extended storage

When no Tivoli Enterprise Monitoring Server is defined in this RTE, the default setting is **N**. In this case you must select a Tivoli Enterprise Monitoring Server from the list that is displayed.

Note: If the monitoring agent is required to switch the primary Tivoli Enterprise Monitoring Server connection in the future, then in this **SPECIFY AGENT ADDRESS SPACE PARAMETERS** panel, press **F10=CMS List** to navigate to the **COMMUNICATION SELECTION** panel. The same procedure also applies if any of the primary Tivoli Enterprise Monitoring Server values that this monitoring agent connects to have changed. The monitoring agent must reconnect to the primary Tivoli Enterprise Monitoring Server to refresh the Tivoli Enterprise Monitoring Server values generated in the monitoring agent runtime members.

Name of primary TEMS
If a primary Tivoli Enterprise Monitoring Server is selected, it is listed here. If a primary Tivoli Enterprise Monitoring Server has not been selected, then None is displayed.

Also in this panel, specify the priority sequence for communication protocols. These are the communication protocol selections:

IP.PIPE
Specifies the use of the TCP protocol for underlying communications.

IP.UDP Specifies the use of the UDP (User Datagram Protocol), which is the packet-based connectionless oriented protocol.

SNA.PIPE
Specifies the use of Systems Network Architecture (SNA)/ Advanced Program-To-Program Communications UDP/IP (User Datagram Protocol), which is the packet-based connectionless oriented protocol (APPC).

IP6.PIPE
Specifies the IP.PIPE protocol with IP Version 6.

IP6.UDP
Specifies the IP.UDP protocol with IP Version 6.

IP6.SPIPE
Specifies the secure IP.PIPE for IP Version 6, and requires z/OS Version is V1.7 or higher.

IP.SPIPE
Specifies the secure IP.PIPE protocol, and requires z/OS version is V1.7 or higher.

Enter the values that you use at your site and press **Enter**. You must specify at least one protocol. The protocols are used in the order in which they appear in the KDC_FAMILIES environment variable for the KDOENV member in the *&hilev*.RKANPARU library.

2. Depending on the order you specified in your communication protocol priority selections, up to three protocol-specific panels that follow are displayed. These panels are used to specify the configuration parameters for each communication protocol type.
   a. If you specified **IP.PIPE**, the **SPECIFY AGENT IP.PIPE CONFIGURATION VALUES** panel shown in Figure 21 is displayed.

```
------------------ SPECIFY AGENT IP.PIPE CONFIGURATION VALUES -----------------
COMMAND ===>

Specify the TCP communication values for this Agent:
Hostname ==> YOURHOST
Address ==> X.XX.XX.XX
Started task ==> TCPIP

If applicable
Network interface card (NIC) ==>
Interlink subsystem ==>
IUCV interface in use? ==> N (Y, N)

Specify Agent IP.PIPE configuration:
Address translation ==> N (Y, N)
Partition name ==>


Enter=Next F1=Help F3=Back
```

Figure 21. Specify agent IP.PIPE configuration values panel in the Configuration Tool

Use the following information to complete the **SPECIFY AGENT IP.PIPE CONFIGURATION VALUES** panel:

Hostname
Specify the TCP ID of the z/OS operating system that you want to connect to. To get this value, run the TSO HOMETEST command and use the first qualifier of the TCP host name.

Address
Specify the TCP address of the z/OS operating system that you want to connect to, for example, *129.0.131.214*. To get this value, issue the TSO HOMETEST command.

Started task
Specify the started task name of TCP which is running on the z/OS operating system host, for example, *TCPIP*.

Address translation
Specify **Y** to configure IP.PIPE support for communication across firewalls using address translation.

Note: By default, Ephemeral Pipe Support (EPS) is enabled automatically to allow IP.PIPE connections which cross a (Network address) translating firewall. This feature needs a broker partition file (KDC_PARTITIONFILE=KDCPART). If you specifically want to disable EPS, then specify **Y** in the **Address** translation field.

Complete this panel and press **Enter** to configure the next communication protocol in your sequence.

b. If you specified **IP.UDP**, the **SPECIFY AGENT IP.UDP CONFIGURATION VALUES** panel shown in Figure 22 to be displayed.

```
-------------------- SPECIFY AGENT IP.UDP CONFIGURATION VALUES --------------------
COMMAND ===>

Specify the TCP communication values for this Agent:
Hostname ==> YOURHOST
Address ==> X.XX.XX.XX
Started task ==> TCPIP

If applicable
Network interface card (NIC) ==>
Interlink subsystem ==>
IUCV interface in use? ==> N (Y, N)


Enter=Next F1=Help F3=Back
```

Figure 22. Specify agent IP.UDP configuration values panel in the Configuration Tool

Use the following information to complete the SPECIFY AGENT IP.UDP CONFIGURATION VALUES panel:

Hostname
Specify the TCP ID of the z/OS operating system that you want to connect to. To get this value, run the TSO HOMETEST command and use the first qualifier of the TCP host name.

Address
Specify the TCP address of the z/OS operating system that you want to connect to, for example, 129.0.131.214. To get this value, issue the TSO HOMETEST command.

Started task
Specify the started task name of TCP which is running on the z/OS operating system host, for example, *TCPIP*.

Complete this panel and press **Enter** to configure the next communication protocol in your sequence.

c. If you specified **SNA.PIPE**, the **SPECIFY AGENT SNA.PIPE CONFIGURATION VALUES** panel shown in Figure 23 is displayed.

```
-------------------- SPECIFY AGENT SNA.PIPE CONFIGURATION VALUES -------------------
COMMAND ===>

Specify the SNA communication value for this Agent:
VTAM applid prefix ==> CTDD4


Enter=Next F1=Help F3=Back F6=Applids
```

Figure 23. Specify agent SNA.PIPE configuration values panel in the Configuration Tool

Use the information that follows to complete the fields in the SPECIFY AGENT SNA.PIPE CONFIGURATION VALUES panel:

Applid prefix
Specifies the value is used to create all of the VTAM APPLIDs required by the Tivoli Enterprise Monitoring Server. These APPLIDs

begin with the prefix, and end with a specific value that makes each APPLID unique. These APPLIDs are contained in the VTAM major node.

When you have provided these values, press **Enter** to save them and return to the Configure IBM Tivoli Decision Support for Z/OS / RTE: panel.

Review the sample JCL and submit the job. Verify that the job completes successfully with a return code of 0. When this job completes, you are returned to the **Configure IBM Tivoli Decision Support for z/OS / RTE:** panel.

Step 3d: Creating runtime members

This step creates the runtime members required by IBM Tivoli Decision Support for z/OS monitoring agent. These members are created in the runtime libraries for this RTE.

To create runtime members, do the following steps:

1. In the **Configure IBM Tivoli Decision Support for z/OS / RTE:** panel, select 4 (**Create runtime members**) and press **Enter**. A JCL job is generated and displayed.
2. Review the sample JCL and submit the job. Verify that the job completes successfully with a return code of 0. When this job completes, you are returned to the **Configure IBM Tivoli Decision Support for z/OS / RTE:** panel.

Step 4: Loading runtime libraries

Before you complete the configuration of the monitoring agent, which is done outside of the Configuration Tool, you must load the runtime libraries from the SMP/E target libraries. The load job requires exclusive access to the runtime libraries.

You must load the runtime libraries after you have done any of the following tasks:

- Installed and configured the products you want in a new RTE
- Installed and configured an additional product in an existing RTE
- Installed maintenance, whether or not you re-configured a product
- Changed the configuration of the monitoring agent

Step 5: Completing the configuration

In the **Configure IBM Tivoli Decision Support for z/OS / RTE:** panel, select 5 (**Complete the configuration**) and press **Enter**. This option displays additional instructions outside of the Configuration Tool to complete the configuration of the monitoring agent and ensure that you have the definitions that have been created in the configuration in your runtime environment.

Step 6: APF-authorizing your libraries

If you use APF authorization, add the following runtime load libraries to your list of APF-authorized libraries:

- *&rhilev.&midlev.&rtename*
- *&rhilev.&midlev.*RKANMOD

- *&rhilev.&midlev.*RKANMODL
- DB2 load module data set

  This will also be specified in the KDO_DB2_LOADLIB environment variables in the KDOENV member in the *&hilev.*RKANPARU library
- Tivoli Decision Support for z/OS load module data set

  This will also be specified in the KDO_TDS_LOADLIB environment variables in the KDOENV member in the *&hilev.*RKANPARU library

Note: Any runtime libraries concatenated in the STEPLIB DDNAME and in the RKANMODL DDNAME of the monitoring agents started task must be APF-authorized.

Step 7: Creating the DB2 views for the monitoring agent

The Tivoli Decision Support for z/OS monitoring agent requires some DB2 views to be created on your existing Tivoli Decision Support for z/OS DB2 database. These DB2 views are used by the monitoring agent to query the data from the DB2 database and then display it in the workspaces of the Tivoli Enterprise Portal client.

The required DB2 views will be created by installing the Tivoli Decision Support for z/OS Monitoring Agent Component. This can be installed from within Tivoli Decision Support for z/OS by going to option 2 (Administration) and then option 2 (Components). Select the ″Monitoring Agent Component″ and install. On the subsequent screen, select all the attribute groups that you wish to view workspaces on from within the Tivoli Enterprise Portal client and hit Enter to perform the install.

To see the DB2 view names and their corresponding column names for each of the monitoring agents attribute groups, refer to Appendix A, “Mapping attributes to the Tivoli Decision Support for z/OS DB2 database,” on page 173.

Step 8: Installing and configuring the distributed components

If you must install additional IBM Tivoli Monitoring components on distributed (Windows or UNIX-based) systems, see the procedures in *IBM Tivoli Monitoring: Installation and Setup Guide* and *Configuring IBM Tivoli Enterprise Monitoring Server on z/OS*.

To install application support for the IBM Tivoli Decision Support for z/OS Monitoring Agent on a Windows or Unix system where either the monitoring server, portal server or desktop client are installed, see Chapter 9, “Installing and configuring the distributed components,” on page 121.

Step 9: Verifying the configuration

Now that you have completed the configuration, verify that it has been successful. Initially, check that the logs that were generated from the jobs are clean and contain no error messages.

To verify your configuration, do the following tasks:

1. Start the started task for Tivoli Enterprise Monitoring Server, using the command **/S** <taskname>, and check the log for any errors.

2. Start the started task for the IBM Tivoli Decision Support for z/OS monitoring agent, **/S** <taskname>, and check the log for any errors.
3. On your system, where you have the Tivoli Enterprise Portal Server installed, start **Manage Tivoli Enterprise Monitoring Services**
4. Start Tivoli Enterprise Portal Server by right-clicking it and selecting **Start** from the menu.
5. Start Tivoli Enterprise Portal client by right-clicking it and selecting **Start** from the menu.

When the Tivoli Enterprise Portal opens, verify that you see the IBM Tivoli Decision Support for z/OS workspaces in the Navigator Physical view in the upper left corner of the screen. Also, verify that the z/OS operating system node is displayed in the Navigator Physical view.

Enabling system variable support

Depending on your configuration, you might choose to enable system variable support for your RTEs. By using system variable support, the components running in this RTE inherit the system values for the system that they are started on (the host z/OS operating system). These system-specific values are then automatically loaded into dynamic in-memory parameter members that exist only for the duration of the running of these IBM components.

You enable system variable support in the ADD RUNTIME ENVIRONMENT panel. In an existing RTE, use the U Update command to enable system variable support. Follow these steps to enable system variable support:

1. Start the Configuration Tool, as described in "Step 2: Starting the Configuration Tool" on page 93. In the **MAIN MENU** panel, enter **3 Configure products** and then **2 Select product to configure**.
2. In the **PRODUCT SELECTION MENU** panel, enter **S** in the **Actions** field next to **IBM Tivoli Decision Support for z/OS V1.8.0**. The Configuration Tool displays the **RUNTIME ENVIRONMENT (RTEs)** panel.
3. Indicate that you want to update an existing RTE by typing **U** in the **Action** field and press **Enter**.
4. In the **ADD RUNTIME ENVIRONMENT (RTEs) (1of 2)** panel, enter all of the required information. See "Step 1b: Specifying values on ADD RUNTIME ENVIRONMENT panels" on page 104 for more information about completing these panels.
5. Press **Enter** to access the **ADD RUNTIME ENVIRONMENT (RTEs) (2 of 2)** panel.
6. Specify the following values to enable system variable support:

Table 7. System variable values

Value	Response
Use z/OS system variables?	Specify Y to enable support. The default setting is N. If System Variable support is enabled, type README SYS on the command line to get more information on how the Configuration Tool processes VTAM applids using z/OS system symbolics.

Table 7. System variable values (continued)

Value	Response
RTE name specification	Specify the system variable name by which the RTE is identified in the SYS1.PARMLIB. The default value is &SYSNAME. This value becomes the value of the SYS parameter in all started tasks (for example, SYS='&SYSNAME'). For example, if you specify a value of CAN&SYSNAME for the RTE name specification, then this value resolves to an RTE name of CANSYSA if &SYSNAME=SYSA. Note: Resolved system variable values cannot exceed the length of the variable name (maximum length of 8 characters). This field might contain literals and symbolics.

Note: If you are updating an existing RTE and you change the values of the **Use z/OS system variables?** field, you must configure again all products in that RTE. This includes re-specifying VTAM values and recreating runtime members.

7. Optionally, specify the following values in the **ADD RUNTIME ENVIRONMENT (RTEs) (2 of 2)** panel to enable other functions:

Value	Response
RTE base alias specification	If this RTE is sharing with a base RTE, specify an optional system variable specification for the base RTE. This value is inserted into the base RTE library references in all started tasks. The resolved name must be a valid library name qualifier. This field is commonly used to switch between base RTEs at different maintenance levels. Use the RTE base alias to perform the following functions: • An easy way to switch RTE bases • An alternate way to refer to an existing base **Note:** A label of n/a is displayed next to this field if the current RTE is not sharing with a base RTE.
Applid prefix specification	Specify the VTAM applid prefix that contains system variables. Place a period after the last symbolic in the specification. The resolved prefix can be a maximum of four characters. The default value is K&SYSCLONE.
Use VTAM model applids?	If you want to use model applids (wildcard characters), specify Y. Using model applids generate VTAM nodes that contain applids with wildcard suffixes wherever possible. These wildcard characters allow usage of any applids that match the pattern within the VTAM node. The default value is N.

8. When you have finished specifying the values to enable system variable support, press F3 until you return to the MAIN MENU panel.

Chapter 9. Installing and configuring the distributed components

This chapter describes the installation and configuration process for installing and configuring the IBM Tivoli Decision Support for z/OS monitoring agent application support files. You must have completed the configuration of the z/OS components, described in the previous chapters of this section.

Prior to installing the Tivoli Decision Support for z/OS monitoring agent application support files you must have installed and configured the IBM Tivoli Monitoring Services infrastructure. Refer to the *IBM Tivoli Monitoring: Installation and Setup Guide* for more information on planning, installing and configuring your IBM Tivoli Monitoring Services environment. To install and configure the Tivoli Enterprise Monitoring Server on a z/OS system, refer to the *IBM Tivoli Monitoring: Configuring Tivoli Enterprise Monitoring Server on z/OS*.

To complete the installation process, you will need the *IBM Tivoli Decision Support for z/OS Monitoring Agent Application Support CD* that is provided with the IBM Tivoli Decision Support for z/OS product package. This CD contains the product-specific application support data and help files for the Tivoli Decision Support for z/OS Monitoring Agent.

Installing the application support files on Windows

The IBM Tivoli Decision Support for z/OS Monitoring Agents application support, including help files and workspaces are found on the IBM Tivoli Decision Support for z/OS Monitoring Agent Application Support CD.

Use the following steps to install application support for the IBM Tivoli Decision Support for z/OS Monitoring Agent on a Windows system where either the monitoring server, portal server, or desktop client are installed.

Note: The monitoring server and portal server are both stopped during the process of adding application support for them.

1. Start the installation by clicking **Setup** in the Windows directory of the IBM Tivoli Decision Support for z/OS Monitoring Agent Application Support CD.
2. From the IBM Tivoli Decision Support for z/OS Monitoring Agent installation wizard **Welcome** panel, click **Next**.

   A **Prerequisites** page is displayed, as shown in Figure 34 on page 130, reminding you that the monitoring agent requires certain minimum supported versions of the IBM Global Security ToolKit and IBM Java. Any current versions are shown on the page, and you have the option to upgrade to the minimum supported levels or bypass this step.
3. On the **Prerequisites** page, select your desired options and click **Next** to continue.

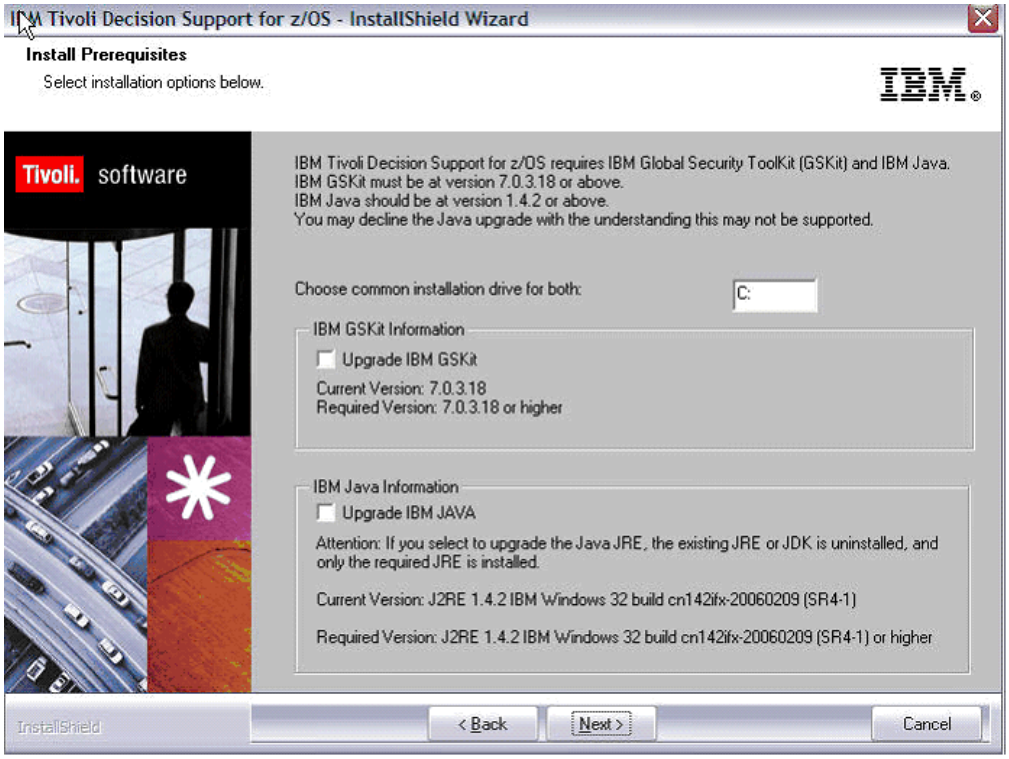

Figure 24. The Prerequisites page

The Software License Agreement page is displayed.

4. Read the terms in the license agreement as presented in the scrollable window and, if you agree to abide by those terms, click **Accept**. You must accept the terms of the license agreement to continue the installation.

   The **Select Features** page is displayed, similar to Figure 25 on page 123, showing the available features that you can install for this product.

5. If you have already installed a monitoring agent or other IBM Tivoli Monitoring components on this computer, the check boxes for these features are already selected. Select the features to install on this computer.

   Note: Depending on where you are running this installation wizard, you may install different components on different machines. You might have to install this on your Tivoli Enterprise Monitoring Server machine, Tivoli Enterprise Portal Server machine, and individual Tivoli Enterprise Portal desktop clients. You only have to install the component that is available for each machine. In the example in Figure 25 on page 123 we have installed all components on a single machine, so all the features have been selected for install.

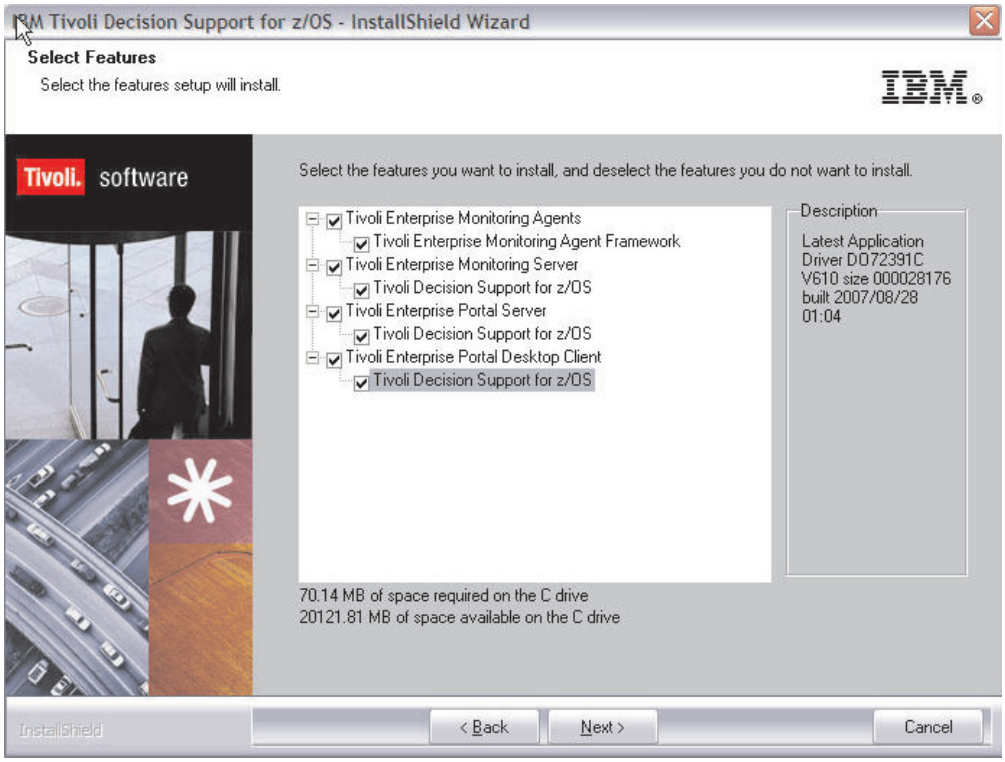

Figure 25. The Select Features page for installing application support

The **Start Copying Files** page is displayed.

6. Review the installation summary details and verify your selections. Click **Next** to start the installation.

   After installation is complete, the **Setup Type** configuration page is displayed, as shown in Figure 26 on page 124.

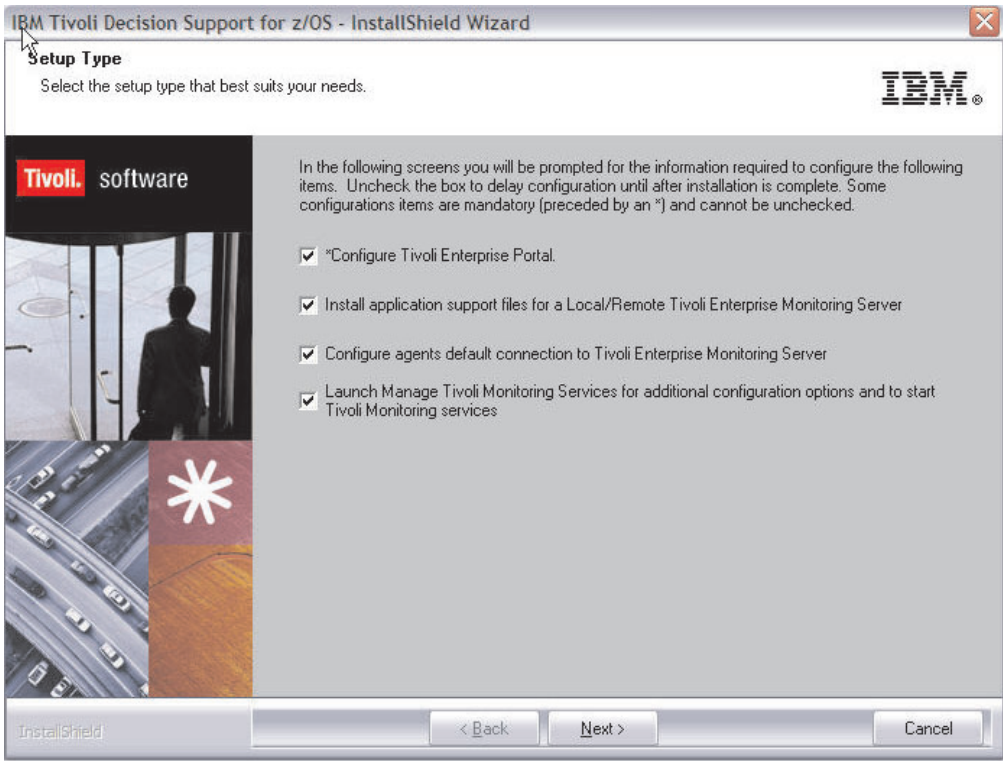

Figure 26. The Setup Type page

7. The **Setup Type** page offers several configuration options to install and configure application support for Tivoli Enterprise Monitoring Server, depending on the features that were selected on the **Select Features** page (see Figure 25 on page 123):
   - Select **Configure Tivoli Enterprise Portal** to add application support for the IBM Tivoli Decision Support for z/OS Monitoring Agent workspaces in the Tivoli Enterprise Portal desktop client.
   - Select **Install application support files for a Local/Remote Tivoli Enterprise Monitoring Server** to install additional support files for the IBM Tivoli Decision Support for z/OS Monitoring Agent into the Tivoli Enterprise Monitoring Server.
   - Select **Configure agents default connection to Tivoli Enterprise Monitoring Server** to define the default connection between the monitoring agent and the monitoring server.
   - Select **Launch Manage Tivoli Monitoring Services** to automatically launch the Manage Tivoli Enterprise Monitoring Services utility after these configuration steps are completed, to support additional configuration tasks and to start monitoring functions.

   By default, all of the setup types are already selected for configuration. In most cases, accept the default selection of these configuration options, and click **Next** to continue. You can clear any of the selections to postpone these configuration tasks until after the installation is completed.
8. If the Tivoli Enterprise Portal Server is installed on this computer, the **TEPS Hostname** page is displayed. The hostname for the local computer is displayed in the field, indicating the default location for the portal server. Accept this default or type in the host name of the computer where the Tivoli Enterprise Portal Server is installed. Click **Next**.

9. If the Tivoli Enterprise Monitoring Server is installed on this computer, the **Tivoli Enterprise Monitoring Server Configuration** page is displayed, as shown in Figure 27:

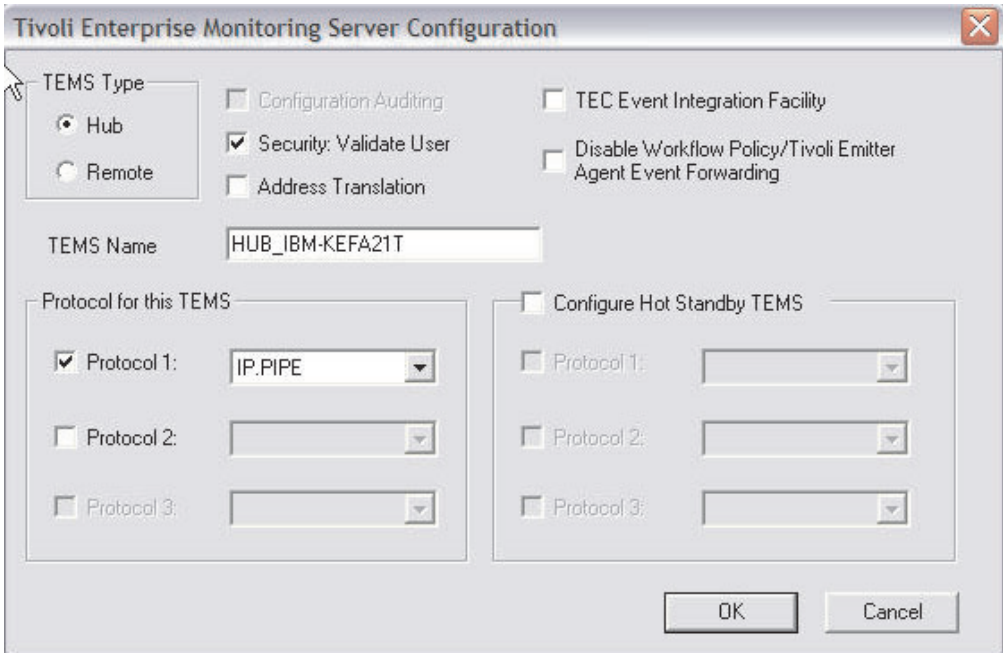

Figure 27. Tivoli Enterprise Monitoring Server Configuration page

In the **TEMS Type** area, if this system is configured as a hub Tivoli Enterprise Monitoring Server, the **Hub** radio button is selected by default. If the system is configured as a remote Tivoli Enterprise Monitoring Server, the **Remote** radio button is selected by default. The **TEMS Name** field is pre-filled with **HUB_**<*hostname*>or **REMOTE_**<*hostname*>, where <*hostname*>is the hostname of the system where the Tivoli Enterprise Monitoring Server is installed.

In the **Protocol for this TEMS** area, the **Protocol 1** check box is selected, and the corresponding entry field is pre-filled with **IP.PIPE**. Select the type of protocol that the monitoring agent uses to communicate with the monitoring server. You have four choices: **IP.UDP**, **IP.PIPE**, **IP.SPIPE**, or **SNA**. Accept these defaults, or select another protocol option. You can specify up to three methods of communication to provide backup methods if needed, depending on your environment. If the method you have identified as **Protocol 1** fails, **Protocol 2** is used. See the IBM Tivoli Monitoring documentation for more information about available protocol selections.

Verify these selections and click **OK**.

If you configured the monitoring server on this system as a Hub server, the **Hub TEMS Configuration page** is displayed (see Figure 28 on page 126).

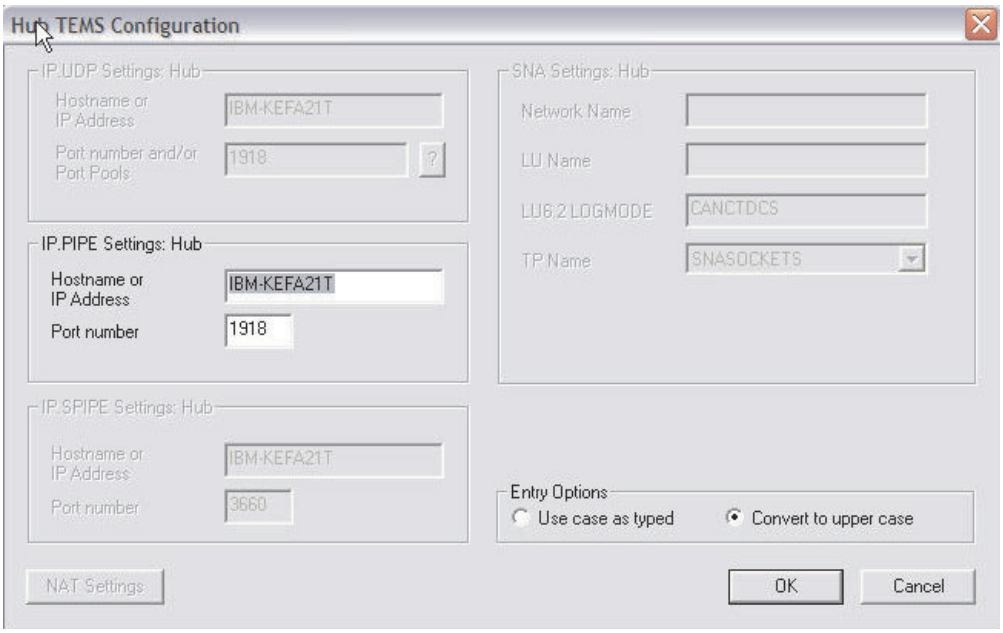

Figure 28. Hub TEMS Configuration page

If you configured the monitoring server on this system as a remote server, the **Remote TEMS Configuration** page is displayed, similar to Figure 28, but showing the host name for the primary Hub Tivoli Enterprise Monitoring Server. Depending on which communication protocols (**IP.UDP**, **IP.PIPE**, **IP.SPIPE**, or **SNA**) you selected in the previous step, the **hostname**, **port number**, and other fields show default values for these communication settings.

The example shown in Figure 28 shows the fields under **IP.PIPE Settings** that you can configure, with default values provided.

10. In each group of selected protocol settings, verify the default values or change them to your preferred settings and click **OK**.

    You selected the **Install application support files for a Local/Remote Tivoli Enterprise Monitoring Server** check box in Figure 26 on page 124 so the **Add application support to the TEMS** page is displayed, as shown in Figure 29, to add application support to the monitoring server.

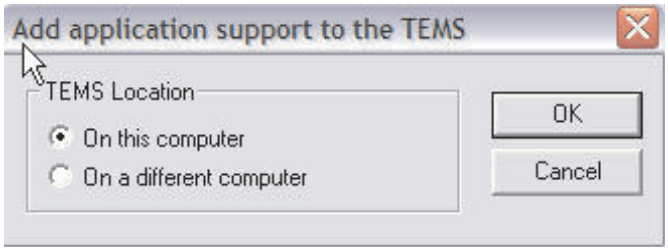

Figure 29. Add application support to the TEMS Configuration page

11. Specify the location of the monitoring server either on this computer or on a different computer.

    Select **On this computer** if you are adding application support files to a monitoring server located on this computer. For a remote monitoring server select **On a different computer** and click **OK**.

12. Select the data that you want to add to the monitoring server. By default, the application support for IBM Tivoli Decision Support for z/OS is already selected, shown in Figure 30.

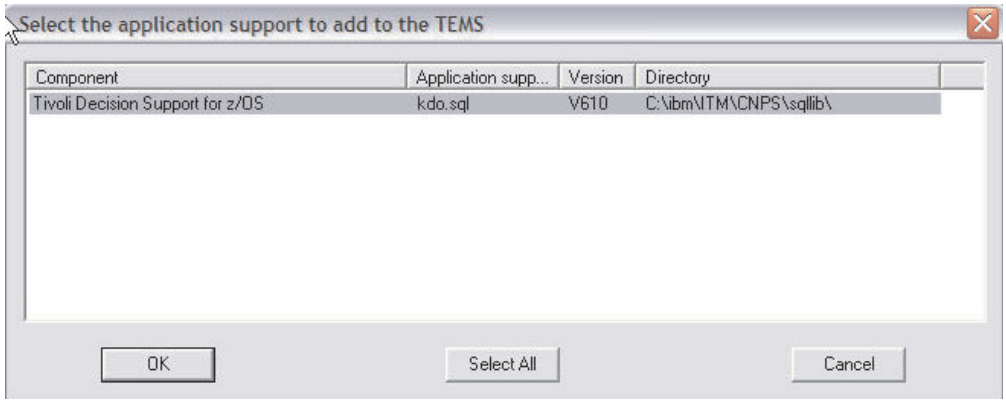

Figure 30. Add application support to the TEMS Configuration page

This is identified under the **Application support file** column as `kdo.sql`. Click **OK**.

After the application support for the IBM Tivoli Decision Support for z/OS Monitoring Agent is added to the Tivoli Enterprise Monitoring server, a message is displayed (see Figure 31).

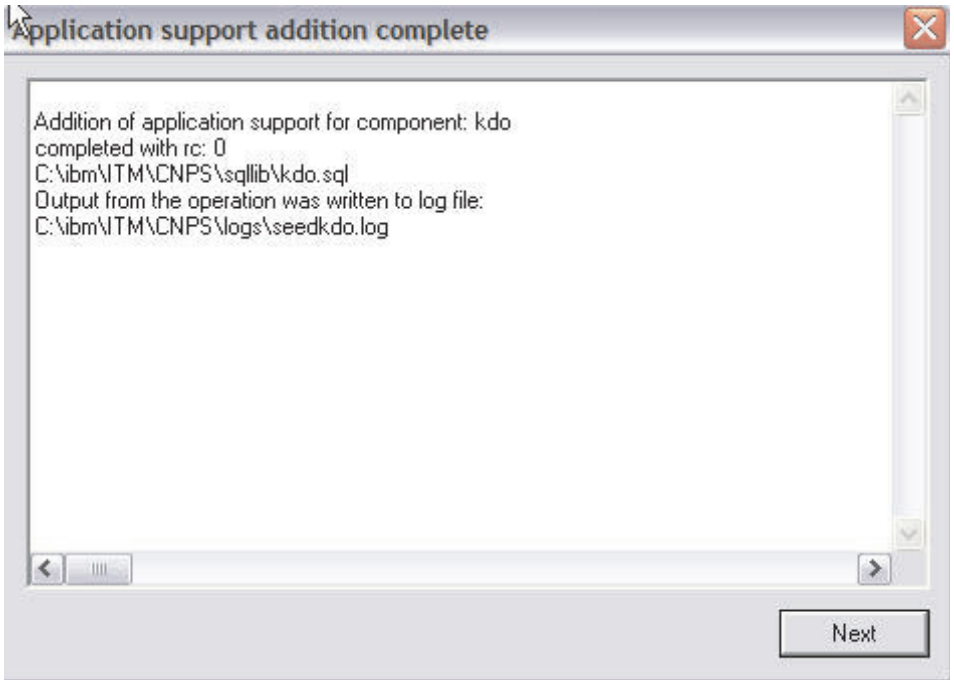

Figure 31. Return code for successfully adding application support for the IBM Tivoli Decision Support for z/OS Monitoring Agent to the Tivoli Enterprise Monitoring Server

13. Click **Next**.

The **Configuration Defaults for Connecting to a TEMS** page is displayed, as shown in Figure 32 on page 128.

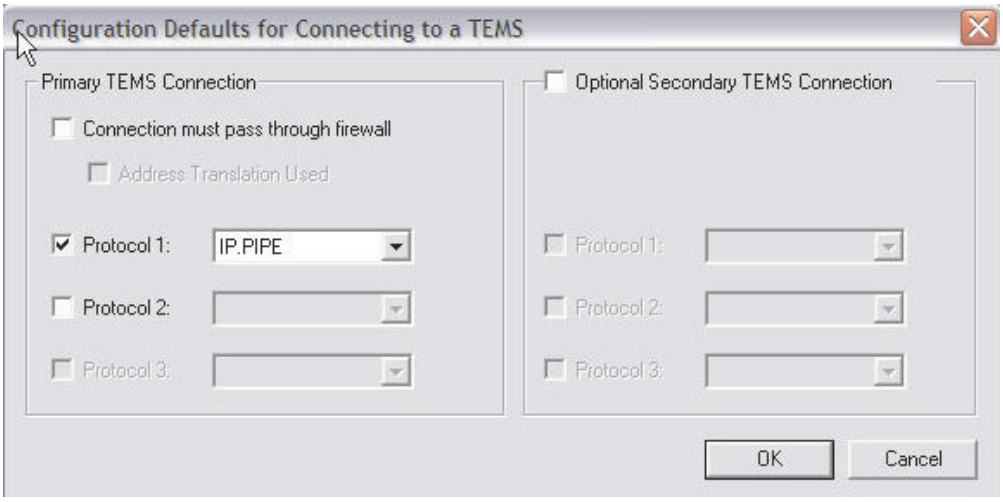

Figure 32. Configuration Defaults for Connecting to a TEMS page

14. In the **Primary TEMS Connection** area, specify the default values for the monitoring agent to use when communicating with Tivoli Enterprise Monitoring Server:
    - If the monitoring agent must cross a firewall to communicate with the monitoring server, select the **Connection must pass through firewall** check box.
    - Select the type of protocol that the monitoring agent uses to communicate with the monitoring server. You have four choices: **IP.UDP**, **IP.PIPE**, **IP.SPIPE**, or **SNA**. The **Protocol 1** check box is selected by default, and **IP.PIPE** is already filled in the field. Accept these defaults, or select another protocol option. You can specify up to three methods of communication to provide backup methods if needed, depending on your environment. If the method you have identified as Protocol 1 fails, Protocol 2 is used. See the IBM Tivoli Monitoring documentation for more information about available protocol selections.

    Note: Do not select **Optional Secondary TEMS Connection**. You can setup failover support for agents after installation. See the IBM Tivoli Monitoring documentation for information on configuring failover support. Click **OK** to continue.

    A second **Configuration Defaults for Connecting to a TEMS** page is displayed (see Figure 33 on page 129).

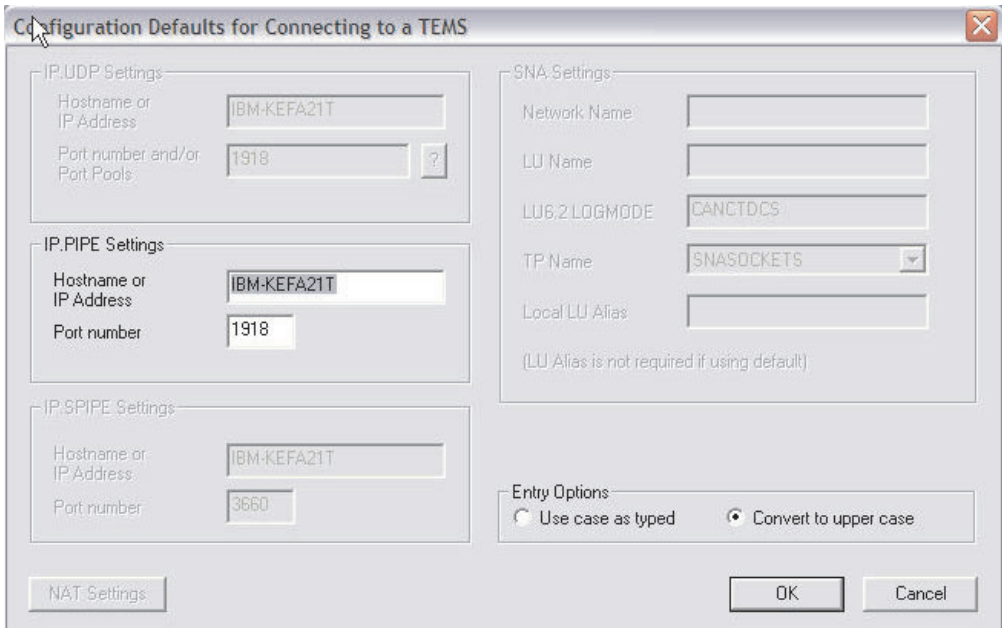

Figure 33. Configuration of defaults for connecting the agent to the Tivoli Enterprise Monitoring Server, continued

15. Depending on which communication protocols (**IP.UDP**, **IP.PIPE**, **IP.SPIPE**, or **SNA**) you selected in the previous step, the **hostname** and **port number** fields show default values for these communication settings. The example shown in Figure 33 shows the fields under **IP.PIPE Settings** that you can configure, with default values provided. Under each group of selected protocol settings, verify the default values or change them to your preferred settings.

    In the example shown in Figure 33, under the **IP.PIPE Settings** section, verify that the hostname of the system where the monitoring server is located is correctly specified in the **Hostname** or **IP Address** field. Accept the default value (1918) for the port number, or enter the port number used to configure the monitoring server, if it is different. Click **OK** to continue.

    The **InstallShield Wizard Complete** page is displayed as shown in Figure 34 on page 130, indicating that the installation was successful, and offering you the option to view the README file for the product, which might contain additional information of interest to you. The check box for displaying the README file is already selected.
16. Leave the check box selected to automatically display the README, or clear this check box to not display the README file if you have already seen it (this readme.txt file is also available in the \WINDOWS directory on the product CD).
17. Click **Finish** to close the installation program.

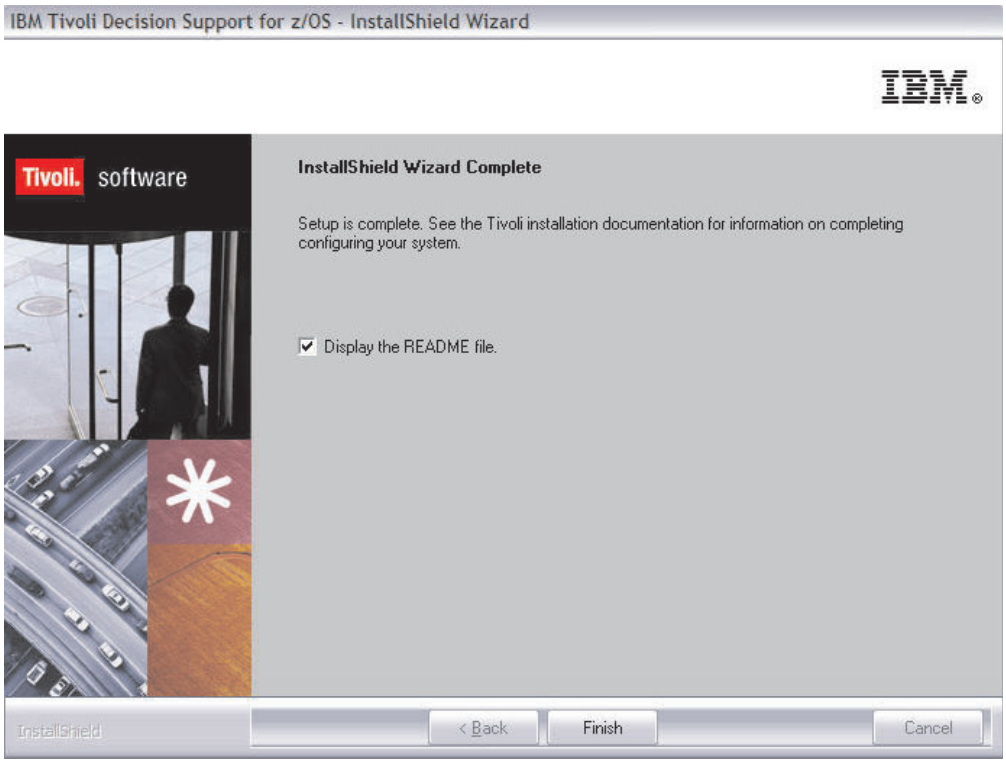

Figure 34. InstallShield Wizard Complete page

If you selected the Launch Manage Tivoli Monitoring Services check box in Figure 26 on page 124, the Manage Tivoli Enterprise Monitoring Services utility is displayed, detailing the IBM Tivoli Monitoring components that are installed on this system.

Installing the application support files on Linux or AIX

The IBM Tivoli Decision Support for z/OS Monitoring Agents application support, including help files and workspaces are found on the IBM Tivoli Decision Support for z/OS Monitoring Agent Application Support CD. Follow the instructions in the following sections to install these files on the various IBM Tivoli Monitoring components.

Linux or AIX: Installing application support on monitoring Servers

Use the following steps to install application support for IBM Tivoli Decision Support for z/OS Monitoring Agents on a Tivoli Enterprise Monitoring Server installed on a supported Linux or AIX operating system. See the IBM Tivoli Monitoring documentation for general procedures for installing application support for monitoring agents on these operating systems.

1. Stop the monitoring server by running the following command:
   `./itmcmd server stop tems_name`
2. Close the Manage Tivoli Enterprise Monitoring Services utility if it is open.
3. Mount the IBM Tivoli Decision Support for z/OS Monitoring Agent Application Support CD at the location you have chosen on the local system, following the standard procedures for your operating system.

4. From the root directory of the product CD, enter the following command to start the installation program:
   ```
   ./install.sh
   ```
5. When prompted for the IBM Tivoli Monitoring home directory, press **Enter** to accept the default (*/opt/IBM/ITM*) or type the full path to the installation directory that you used.
6. The following prompt is displayed:
   ```
   Select one of the following:
   1) Install products to the local host.
   2) Install products to depot for remote deployment (requires TEMS).
   3) Exit install.

   Please enter a valid number:
   ```
   Type **1** to start the installation and press **Enter**.
7. Type the number that corresponds to the language in which you want to display the software license agreement and press **Enter**.
8. press **Enter** to display the agreement.
9. Type **1** to accept the agreement and press **Enter**.
10. You might be prompted to type a 32 character encryption key and press Enter. This key should be the same as the key that was used during the installation of the monitoring server.
11. A numbered list of available operating systems and installation components is displayed. Type the number that corresponds to *Tivoli Enterprise Monitoring Server support* for the target operating system and press **Enter**.
12. Type **y** to confirm and press **Enter**.
13. A list of the components to install is displayed. Type the number that corresponds to selecting all components to install and press **Enter**.
14. Type **y** to confirm the installation.
    The installation begins.
15. After all of the components are installed, you are asked whether you want to install components for a different operating system. Type **n** and press **Enter**.
16. Start the monitoring server by running the following command:
    ```
    ./itmcmd server start tems_name
    ```
17. Enter the following command to activate the application support on the monitoring server:
    ```
    ./itmcmd support -t tems_name do
    ```
    In this command, *tems_name* is the name of the monitoring server and *do* is the product code for the IBM Tivoli Decision Support for z/OS monitoring agent.
18. Stop the monitoring server by running the following command:
    ```
    ./itmcmd server stop tems_name
    ```
19. Enter the following command to restart the monitoring server:
    ```
    ./itmcmd server start tems_name
    ```

Linux or AIX: Installing application support on the portal server

Use the following steps to install application support for the IBM Tivoli Decision Support for z/OS monitoring agent on the Tivoli Enterprise Portal server installed

on a supported Linux or AIX operating system. See the IBM Tivoli Monitoring documentation for general procedures for installing application support for the portal server on these operating systems.

1. Stop the Tivoli Enterprise Portal Server by running the following command from the /opt/IBM/ITM/bin directory (or the location where you installed IBM Tivoli Monitoring):

   ```
   ./itmcmd agent stop cq
   ```

2. Close the Manage Tivoli Enterprise Monitoring Services utility if it is open.
3. Mount the IBM Tivoli Decision Support for z/OS Monitoring Agent Application Support CD at the location you have chosen on the local system, following the standard procedures for your operating system.
4. From the root directory of the product CD, enter the following command to start the installation program:

   ```
   ./install.sh
   ```

5. When prompted for the IBM Tivoli Monitoring home directory, press Enter to accept the default (*/opt/IBM/ITM*) or type the full path to the installation directory that you used.
6. The following prompt is displayed:

   ```
   Select one of the following:
   1) Install products to the local host.
   2) Install products to depot for remote deployment (requires TEMS).
   3) Exit install.

   Please enter a valid number:
   ```

   Type **1** to start the installation and press **Enter**.
7. Type the number that corresponds to the language in which you want to display the software license agreement and press **Enter**.
8. Press **Enter** to display the agreement.
9. Type **1** to accept the agreement and press **Enter**.
10. A numbered list of available operating systems and installation components is displayed. Type the number that corresponds to *Tivoli Enterprise Portal Server Browser Client support* for your operating system and press **Enter**.
11. Type *y* to confirm and press **Enter**.

    A list of the components to install is displayed. Type the number that corresponds to selecting all components to install and press **Enter**.
12. Type **y** to confirm the installation.

    The installation begins.
13. After all of the components are installed, you are asked whether you want to install components for a different operating system. Type *y*and press **Enter**.
14. A numbered list of available operating systems and installation components is displayed. Type the number that corresponds to *Tivoli Enterprise Portal Server support* for your operating system and press **Enter**.
15. Type **y** to confirm and press **Enter**.

    A list of the components to install is displayed. Type the number that corresponds to selecting all components to install and press **Enter**.
16. Type **y**to confirm the installation.

    The installation begins.
17. After all of the components are installed, you are asked whether you want to install components for a different operating system. Type **n** and press **Enter**.
18. Stop the portal server by running the following command:

```
./itmcmd agent stop cq
```

19. Run the following command to configure the portal server with the new agent information:

    ```
    ./itmcmd config –A cq
    ```

20. Complete the configuration as prompted. For information regarding configuring the portal server, see the section on *Configuring the portal server on Linux*, in the *IBM Tivoli Monitoring: Installation and Setup Guide*.
21. Start the portal server by running the following command:

    ```
    ./itmcmd agent start cq
    ```

Linux: Installing application support on the desktop client

Use the following steps to install application support for the IBM Tivoli Decision Support for z/OS monitoring agent on the Tivoli Enterprise Portal desktop client installed on a supported Linux operating system. See the IBM Tivoli Monitoring documentation for general procedures for installing application support for the Tivoli Enterprise Portal desktop client on this operating system.

1. Stop the Tivoli Enterprise Portal desktop client by running the following command from the /opt/IBM/ITM/bin directory (or the location where you installed IBM Tivoli Monitoring):

   ```
   ./itmcmd agent stop cj
   ```

2. Close the Manage Tivoli Enterprise Monitoring Services utility if it is open.
3. Mount the IBM Tivoli Decision Support for z/OS Monitoring Agent Application Support CD at the location you have chosen on the local system, following the standard procedures for your operating system.
4. From the root directory of the product CD, run the following command to start the installation program:

   ```
   ./install.sh
   ```

5. When prompted for the IBM Tivoli Monitoring home directory, press Enter to accept the default (*/opt/IBM/ITM*) or type the full path to the installation directory that you used.
6. The following prompt is displayed:

   ```
   Select one of the following:

   1) Install products to the local host.
   2) Install products to depot for remote deployment (requires TEMS).
   3) Exit install.

   Please enter a valid number:
   ```

   Type **1**to start the installation and press **Enter**.
7. Type the number that corresponds to the language in which you want to display the software license agreement and press **Enter**.
8. Ppress **Enter** to display the agreement.
9. Type **1**to accept the agreement and press **Enter**.
10. A numbered list of available operating systems and installation components is displayed. Type the number that corresponds to *Tivoli Enterprise Portal Desktop Client support* for your operating system and press **Enter**.
11. Type **y**to confirm and press **Enter**.

    A list of the components to install is displayed. Type the number that corresponds to selecting all components to install and press **Enter**.
12. Type **y**to confirm the installation.

    The installation begins.

13. After all of the components are installed, you are asked whether you want to install components for a different operating system. Type **n**and press **Enter**.
14. Run the following command to configure the Tivoli Enterprise Portal desktop client with the new agent information:

    ```
    ./itmcmd config –A cj
    ```

    Complete the configuration as prompted. For information regarding configuring the Tivoli Enterprise Portal desktop client, see the section on *Configuring the portal desktop client on Linux*, in the *IBM Tivoli Monitoring: Installation and Setup Guide*.
15. Start the Tivoli Enterprise Portal desktop client by running the following command:

    ```
    ./itmcmd agent start cj
    ```

Part 3. Problem Determination

Chapter 10. Messages

This chapter documents messages generated by the IBM Tivoli Decision Support for z/OS monitoring agent. In the course of running and administering the product, you might see messages not listed here. Those messages are probably issued by other components of Tivoli Monitoring Services and documented in the *IBM Tivoli Monitoring: Problem Determination Guide*. The prefix of each message in the log and trace files can help you determine which component generated the message.

Message formats

IBM Tivoli Decision Support for z/OS monitoring agent messages are a format which includes a single-digit component identifier with a message type. The messages are in the following format:

KDO*xyyyz* (for messages written to the agent log)

Where:

KDO IBM Tivoli Decision Support for z/OS monitoring agent product identifier.

x Component Identifier.
KDO messages have the following identifiers:

I Intelligent Remote Agent

yyy Message Number.

z One-letter message type. Some messages have this message type indicator. It can be one of the following:

- **I** for informational messages, which typically do not require administrator or operator actions.
- **W** for warning messages, which typically require actions.
- **E** for error messages, which indicate a problem that you must resolve before normal operation can continue.

KDOI Messages

KDOI001E IRA Manager command unknown: command

Explanation: The IBM Tivoli Decision Support for z/OS monitoring agent IRA Registration Thread received an unsupported command.

User response: Check the RKLVLOG for additional messages that might indicate why the IRA Registration Thread command was invalid. If problems persist, contact IBM Software Support.

KDOI002E IRA Manager command operand missing

Explanation: The IBM Tivoli Decision Support for z/OS monitoring agent IRA Registration Thread received a command that did not have all required operands.

User response: Check the RKLVLOG for additional messages that might indicate why the IRA Registration Thread command was invalid. If problems persist, contact IBM Software Support.

KDOI003E TDS Database Subsystem is not set

Explanation: The KDO_DB2_SYSTEM environment variable for the Tivoli Decision Support for z/OS database subsystem is missing from the KDOENV file.

User response: Modify the KDOENV file to include an entry for KDO_DB2_SYSTEM. The value should contain the name of the Tivoli Decision Support for z/OS database subsystem.

KDOI004E TDS Database Prefix is not set

Explanation: The KDO_DB2_PREFIX environment variable for the Tivoli Decision Support for z/OS DB2 data table prefix is missing from the KDOENV file.

User response: Modify the KDOENV file to include an entry for KDO_DB2_PREFIX. The value should contain the table prefix for the Tivoli Decision Support for z/OS DB2 database.

KDOI005E TDS Database Plan Name is not set

Explanation: The KDO_DB2_PLAN environment variable for the Tivoli Decision Support for z/OS DB2 plan name is missing from the KDOENV file.

User response: Modify the KDOENV file to include an entry for KDO_DB2_PLAN. The value should contain the plan name for the Tivoli Decision Support for z/OS DB2 database.

KDOI006I DB2 row limit not set. Set to system default: maxrows

Explanation: The KDO_DB2_MAXROWS environment variable for the maximum number of rows to return from the Tivoli Decision Support for z/OS database per query is missing from the KDOENV file. It has been set to a default of 10,000 rows.

User response: Accept the system default or modify the KDOENV file to include an entry for KDO_DB2_MAXROWS. The value should contain the maximum number of rows to return from the Tivoli Decision Support for z/OS DB2 database per query.

KDOI010E Unable to allocate memory for Data Collector block.

Explanation: The IBM Tivoli Decision Support for z/OS monitoring agent was unable to allocate memory for the data collector thread.

User response: Check the RKLVLOG for additional messages that might indicate why memory could not be allocated. If problems persist, contact IBM Software Support.

KDOI011E pthread_cond_init() error on request condition.

Explanation: The condition variable for requests could not be initialized.

User response: Check the RKLVLOG for additional messages that might indicate why the request condition variable could not be initialized. If problems persist, contact IBM Software Support.

KDOI013E pthread_cond_init() error on query condition.

Explanation: The condition variable for queries could not be initialized.

User response: Check the RKLVLOG for additional messages that might indicate why the query condition variable could not be initialized. If problems persist, contact IBM Software Support.

KDOI014E pthread_mutex_init() error on query mutex.

Explanation: The mutex for queries could not be initialized.

User response: Check the RKLVLOG for additional messages that might indicate why the query mutex could not be initialized. If problems persist, contact IBM Software Support.

KDOI015E pthread_mutex_init() error on collect mutex.

Explanation: The mutex for collects could not be initialized.

User response: Check the RKLVLOG for additional messages that might indicate why the collect mutex could not be initialized. If problems persist, contact IBM Software Support.

KDOI016E pthread_cond_init() error on shutdown condition.

Explanation: The condition variable for shutdowns could not be initialized.

User response: Check the RKLVLOG for additional messages that might indicate why the shutdown condition variable could not be initialized. If problems persist, contact IBM Software Support.

KDOI017E pthread_mutex_init() error on shutdown mutex.

Explanation: The mutex for shutdowns could not be initialized.

User response: Check the RKLVLOG for additional messages that might indicate why the shutdown mutex could not be initialized. If problems persist, contact IBM Software Support.

KDOI018E pthread_create() error on data collector thread

Explanation: The IBM Tivoli Decision Support for z/OS monitoring agents data collector thread could not be started.

User response: Check the RKLVLOG for additional messages that might indicate why the data collector thread could not be started. If problems persist, contact IBM Software Support.

KDOI019E pthread_detach() error on data collector thread.

Explanation: The IBM Tivoli Decision Support for z/OS monitoring agents data collector thread could not be detached.

User response: Check the RKLVLOG for additional messages that might indicate why the data collector thread could not be detached. If problems persist, contact IBM Software Support.

KDOI020E Unable to allocate memory for Data Collector parms.

Explanation: No memory has been allocated for the data collector parameter structure.

User response: Check the system for reasons why storage could not be allocated. Check the RKLVLOG for additional messages that might indicate why the data collector parameter structure has not been allocated, and if problems persist contact IBM Software Support.

KDOI021E Data Collector Block is null.

Explanation: No memory has been allocated for the data collector anchor block.

User response: Check the system for reasons why storage could not be allocated. Check the RKLVLOG for additional messages that might indicate why the data collector block has not been allocated, and if problems persist contact IBM Software Support.

KDOI022E Data Collector Parms is null.

Explanation: No memory has been allocated for the data collector parameter structure.

User response: Check the system for reasons why storage could not be allocated. Check the RKLVLOG for additional messages that might indicate why the data collector parameter structure has not been allocated, and if problems persist contact IBM Software Support.

KDOI030E Call to AddData() failed. rc=retcode for table=table

Explanation: An error occurred (return code = retcode) while trying to return data to the Tivoli Enterprise Monitoring Server for table *table*. The most common cause of this error is a query that returns too many rows of data, causing an out-of-memory condition.

User response: Modify the query so that it returns fewer rows of data. Changing the KDO_DB2_MAXROWS environment variable in the KDOENV file based on the maximum number or rows you want to be returned from a DB2 query, can eliminate this error message.

KDOI031E SQL Error occurred in Data Collector. sqlcode=sqlcode

Explanation: The data collector received an SQL error of *sqlcode* when attempting to perform a SQL query against the IBM Tivoli Decision Support for z/OS DB2 database.

User response: Check DRLOUT and DRLDUMP for a detailed description of what SQL error occurred and then take the appropriate action to rectify this error. A common cause of this error is where the monitoring agents DB2 views on the IBM Tivoli Decision Support DB2 database have not been created.

KDOI032I Maximum Row limit was reached. Only maxrows rows returned

Explanation: The number of rows returned from a DB2 query on the IBM Tivoli Decision Support for z/OS DB2 database exceeded the maximum amount of rows allowed as defined in the KDO_DB2_MAXROWS environment variable set in the KDOENV file.

User response: Adjust your query to return fewer rows or increase the maximum number of rows allowed to be returned in a query by adjusting the KDO_DB2_MAXROWS environment variable set in the KDOENV file. Be wary of the performance implications of sending large amounts of row data across the network and the impact on the refresh time for the Tivoli Enterprise Portal clients.

KDOI033E Error occurred in Data Collector Thread. Return code=returnc reason=reasonc

Explanation: An unexpected error occurred in the data collector thread when performing the sql query against the IBM Tivoli Decision Support for z/OS DB2 database.

User response: Check the DRLOUT, DRLDUMP, and RKLVLOG for additional messages that might indicate why the error occurred. If problems persist, contact IBM Software Support.

Chapter 11. Problem determination

This chapter helps you decide where to look for causes when you have a problem with the IBM Tivoli Decision Support for z/OS Monitoring Agent. Some of the problems you encounter might involve Tivoli Monitoring Services common components (such as the Tivoli Enterprise Monitoring Server, Tivoli Enterprise Portal Server, and Tivoli Enterprise Portal client) rather than the IBM Tivoli Decision Support for z/OS monitoring agent. See the *IBM Tivoli Monitoring: Problem Determination Guide* for problems related to the common components.

Typically, you start with a symptom, or set of symptoms, and trace them back to their cause. This process is called *problem determination*. Problem determination is not the same as problem solving, although during the process of problem determination, you can often obtain enough information to solve a problem. Sometimes, however, you might encounter a problem that you cannot solve by yourself, even after determining its cause. For example, a performance problem might be caused by a limitation of your hardware. If you are unable to solve a problem on your own, contact IBM Software Support for a solution.

Problem determination flow

When you encounter a problem with any component, the primary troubleshooting feature is logging. *Logging* refers to the writing of text messages and trace data generated by the software to an output destination, such as a console screen or a file. A monitoring agent does not display most messages at the Tivoli Enterprise Portal. Instead, the messages are sent to more typical z/OS output locations, such as sysout data sets or spool files or, more rarely, to the z/OS system console.

Tracing creates a record of the processing of a computer program or transaction. Trace logs capture information about the operating environment to help you diagnose problems when components fail to operate as intended. The principal trace log type is the reliability, availability, and serviceability (RAS1) trace log. You can set up RAS tracing for the monitoring agents, Tivoli Enterprise Monitoring Server, and Tivoli Enterprise Portal Server. The default level of tracing depends on the component and operating system. For the monitoring agents on z/OS, the default level is KBB_RAS1=ERROR, which means that only error messages are captured. This is the setting for minimal tracing.

Tip:

- Two useful tools can help you collect, view, analyze, and correlate log and trace information:
  - IBM Support Assistant.
  - Log and Trace Analyzer tool.
- Overhead (CPU and I/O) associated with detailed RAS1 tracing might degrade performance of the monitoring agent. Restore RAS1 tracing for the monitoring agent to the default level KBB_RAS1=ERROR after you complete problem diagnosis.

Figure 35 on page 142 shows the flow of problem determination procedures for a monitoring agent on z/OS.

Problem determination flow

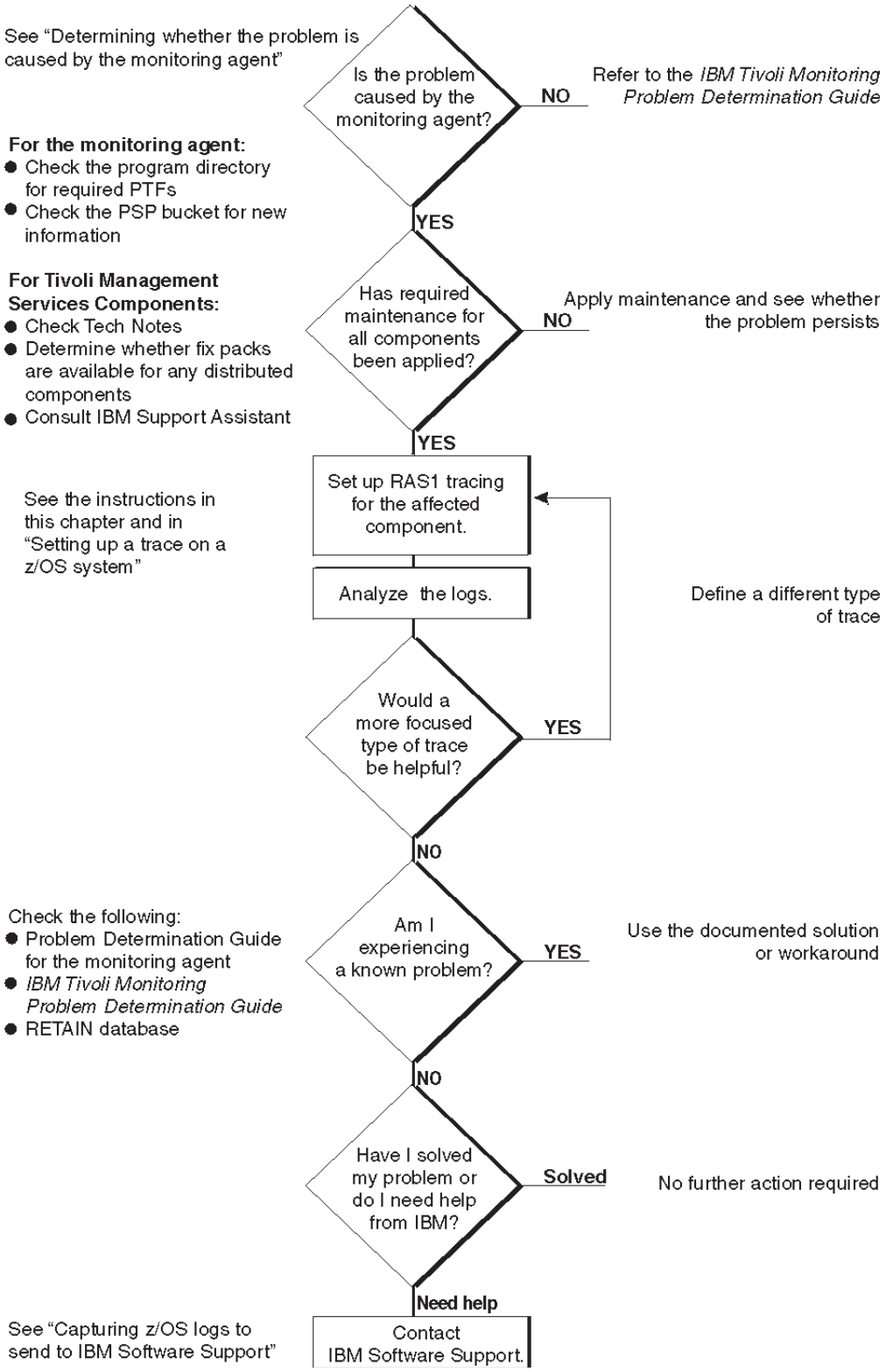

Figure 35. Problem determination flow for a monitoring agent on z/OS

Determining whether the problem is caused by the Monitoring Agent

One of the most difficult troubleshooting issues in a client-server environment such as Tivoli Monitoring Services is determining which component is the origin of the problem. In most cases, the problem might seem to be a Tivoli Enterprise Portal client problem because this is what you can see. However this can be misleading because the client can display data only if it receives data from the Tivoli Enterprise Monitoring Server.

In any problem scenario, try to gather documentation at the time of the error. What appears to be a client problem might well be a server problem, especially if data is not showing up at the client.

Tip: The prefix of each message in the log and trace files can help you determine the component that generated the message. See “Message formats” on page 137.

As you collect logs, create an exact description of the problem. For reproducible problems, document the exact navigation path that produced the error. Screen prints might also help with problem determination. For locations of log files for all the components of Tivoli Monitoring Services and for information about enabling tracing for distributed components, see the *IBM Tivoli Monitoring: Problem Determination Guide*.

The sections that follow discuss types of problems that you might see and methods of capturing the information needed to diagnose those problems.

Reproducible problems reported as Tivoli Enterprise Portal client problems

If the problem is reproducible and is reported as a Tivoli Enterprise Portal client problem, you need the client log. The location of the log depends on the type of client and the operating system the client is running on. You might be asked to set a trace in the client and then collect the log.

Log files are created automatically when you start the Tivoli Enterprise Portal. You can view the logs with any text editor. Logon prompts, progress messages, and error messages are also displayed in the status bar of the Tivoli Enterprise Portal logon window. You can change the level of tracing by either of two methods:

- In the Tivoli Enterprise Portal, select **File > Trace Options...**. See the Tivoli Enterprise Portal online help for instructions.
- In Manage Tivoli Monitoring Services, right-click **Tivoli Enterprise Portal** and select **Advanced > Edit Trace Parms...**.

If the Tivoli Enterprise Portal desktop client is being used, collect the logs shown in Table 8 on page 144.

Table 8. Log locations for Tivoli Enterprise Portal desktop client

Component	Windows System	Linux System
Tivoli Enterprise Portal desktop client	*install_dir*\CNP\logs where *install_dir* is the directory where the Tivoli Monitoring Services components are installed (usually, C:\IBM\ITM). You can find three types of log files in the portal client log location: • kcjerror.log contains environment variables and command strings for starting the Tivoli Enterprise Portal. Tivoli Enterprise Portal keeps the last five error logs (kcjerror_1.log, kcjerror_2.log, and so on) in addition to the current one. Every time the Tivoli Enterprise Portal starts, it purges the oldest error log and renames the rest. • kcjras1.log contains the RAS1 tracing for the portal client. • KCJ.LOG contains any errors in the Java libraries used by the portal client. Every time the Tivoli Enterprise Portal starts, it purges the kcjras1.log and KCJ.LOG files and writes new ones. If you want to preserve these log files, you must rename them or copy them to another directory before restarting the Tivoli Enterprise Portal.	*install_dir/logs/ hostname_cj_timestamp.log* where: **install_dir** Is the directory where the Tivoli Monitoring Services components are installed. **hostname** Is the host name of the system. **cj** Is the component code for the portal client. **timestamp** Is a decimal representation.

If the Tivoli Enterprise Portal browser client is being used, collect the following trace log:

```
C:\Documents
and Settings\Administrator\Application
Data\IBM\Java\Deployment\log\plugin1.4.2.trace
```

The plugin1.4.2.trace file contains the RAS1 tracing for the Tivoli Enterprise Portal browser client and any Java exceptions. You might need to edit your Internet Explorer browser options to enable tracing on your local system. When tracing is enabled, you can change the level of tracing by selecting **File > Trace Options...** in the Tivoli Enterprise Portal.

The Tivoli Enterprise Portal Server log is found in the locations shown in Table 9.

Table 9. Log locations for Tivoli Enterprise Portal Server

Component	Windows System	Linux System
Tivoli Enterprise Portal Server	*install_dir*\logs\ *hostname_cq_hex_timestamp-nn.log* where: **install_dir** Is the directory where the Tivoli Monitoring Services components are installed. **hostname** Is the host name of the system. **cq** Is the component code for the portal server. **hex_timestamp** Is a hexadecimal representation of the time when the process started. **nn** Represents the circular sequence in which logs are rotated. Ranges from 01 to 05, by default, though the first is always retained, since it includes configuration parameters.	*install_dir/logs/ hostname_cq_timestamp.log* where: **install_dir** Is the directory where the Tivoli Monitoring Services components are installed. are installed. **hostname** Is the host name of the system. **cq** Is the component code for the portal server. **timestamp** Is a decimal representation of the time when the process started.

The log files are created automatically when you start the portal server. You can view the logs with any text editor.

When you investigate portal server problems on Windows systems, use the Windows Event Viewer to check that the portal server started correctly and to look for errors. You can also use the service console, accessible from the portal server with an Internet Explorer browser, to read logs and turn on traces for remote product diagnostics and configuration information. See *IBM Tivoli Monitoring: Problem Determination Guide* for instructions on using the service console.

You can change trace settings in Manage Tivoli Monitoring Services. Right-click **Tivoli Enterprise Portal Server** and select **Advanced > Edit Trace Parms...**.

In addition, you can set the portal server to display messages in a command prompt window on a Windows system.

1. Right-click **Tivoli Enterprise Portal Server** in the **Manage Tivoli Monitoring Services** window.
2. Select **Change startup**.

3. Select **Allow service to interact with desktop**.

Collect the Tivoli Enterprise Monitoring Server logs, too. Even when a problem appears to be a Tivoli Enterprise Portal problem, the real problem might be a monitoring server failure.

- Table 10 shows the location of logs for a Tivoli Enterprise Monitoring Server on distributed systems.
- Table 11 on page 148 shows the location of logs for a Tivoli Enterprise Monitoring Server on a z/OS system.

Table 10. Log locations for Tivoli Enterprise Monitoring Server on distributed systems

Component	Windows System	Linux System
Tivoli Enterprise Monitoring Server	*install_dir*\logs\ *hostname_cms_hex_timestamp-nn*.log where: **install_dir** Is the directory where the Tivoli Monitoring Services components are installed. **hostname** Is the host name of the system. **cms** Is the component code for the monitoring server. **hex_timestamp** Is a hexadecimal representation of the time when the process started. **hex_timestamp** Is a hexadecimal representation of the time when the process started. **nn** Represents the circular sequence in which logs are rotated. Ranges from 01 to 05, by default, though the first is always retained, since it includes configuration parameters.	*install_dir/logs/ hostname_ms_timestamp.log* where: **install_dir** Is the directory where the Tivoli Monitoring Services components are installed. **hostname** Is the host name of the system. **ms** Is the component code for the monitoring server. **timestamp** Is a decimal representation of the time when the process started.

The log files are created automatically when you start the monitoring server on a Windows, Linux, or UNIX system. You can view the log files with any text editor.

When you investigate monitoring server problems on Windows systems, use the Windows Event Viewer to check that the monitoring server started correctly and to

look for errors. You can also use the service console, accessible from the portal server with an Internet Explorer browser, to read logs and turn on traces for remote product diagnostics and configuration information. See *IBM Tivoli Monitoring: Problem Determination Guide* for instructions on using the service console.

You can change trace settings in Manage Tivoli Monitoring Services. Select **Action > Advanced > Edit Trace Parms...**.

In addition, you can set the monitoring server to display messages in a command prompt window on a Windows system.

1. Right-click **Tivoli Enterprise Monitoring Server** in the **Manage Tivoli Monitoring Services** window.
2. Select **Change startup**.
3. Select **Allow service to interact with desktop**.

Irreproducible problems reported as Tivoli Enterprise Portal client problems

If a problem reported as a Tivoli Enterprise Portal client problem is not reproducible, collect the portal client and portal server logs. The logs might be the only indication of the real problem. Always try to get the logs at the time of the error.

Problems reported as Tivoli Enterprise Portal Server problems

If the problem is reported as a Tivoli Enterprise Portal Server problem, collect the portal server logs. If the problem is reproducible, you might be asked to set unit traces for the portal server and gather the logs. The location for the portal server logs is found in Table 9 on page 145. Also collect the portal client log at the time of the error, if it is available.

Problems affecting the monitoring agent

After you have ruled out problems with Tivoli Monitoring Services components, treat the problem as a monitoring agent problem. A data collection problem with a monitoring agent manifests itself as the display of no data or incorrect data in the Tivoli Enterprise Portal.

Log files and trace information are provided in a common fashion across all monitoring agents on z/OS and the z/OS components of the Tivoli Monitoring Services. Two useful tools can help you collect, view, analyze, and correlate the log and trace information:

- IBM Support Assistant.
- Log and Trace Analyzer tool.

  Table 11 on page 148 explains the location of log and trace files for the monitoring agent and the Tivoli Monitoring Services z/OS components.

Table 11. Locations of log and trace information for z/OS components

Component	Locations of log and trace information
Monitoring agent	RKLVLOG for the monitoring agent started task is the single most helpful piece of service information for a monitoring agent on z/OS. The RKLVLOG is the sysout data set or spool file that contains log and trace messages. Instructions on how to save the contents of this log to a dataset are provided under "Capturing z/OS logs to send to IBM Software Support" on page 165. These additional log files (if available) are also useful: • The RKLVSNAP sysout data set or spool file contains formatted dump output. • The RKPDLOG sysout data set or spool file contains information and error messages related to the handling of persistent data stores. • The DRLOUT sysout data set or spool file contains information and error messages related to the SQL queries that the monitoring agent is performing against the IBM Tivoli Decision Support for z/OS DB2 database. • The DRLDUMP sysout data set or spool file contains detailed dump output related to the SQL queries that the monitoring agent is performing against the IBM Tivoli Decision Support for z/OS DB2 database. Refer to your started procedures for the locations of these serviceability log files.
Tivoli Enterprise Monitoring Server on z/OS	Because the Tivoli Enterprise Monitoring Server on z/OS runs under ITMS:Engine just as a monitoring agent on z/OS does, all logging under ITMS:Engine is handled the same way: log and trace data is written to RKLVLOGs and RKPDLOGs.
ITMS:Engine	ITMS:Engine is a collection of basic operating system and communication service routines built specifically for z/OS. All address spaces used by monitoring agents load and use the services of ITMS:Engine. The following message indicates successful initialization of ITMS:Engine: `KLVIN408 IBM OMEGAMON PLATFORM ENGINE VERSION 400 READY` For troubleshooting information about ITMS:Engine problems, refer to the z/OS initialization section of *IBM Tivoli Monitoring: Problem Determination Guide*. ITMS:Engine writes messages to the same RKLVLOG as the product it is running. For the IBM Tivoli Decision Support for z/OS monitoring agent, product-specific messages begin with the product code KDO. Messages for the ITMS:Engine begin with the product code KLV. Tivoli Enterprise Monitoring Server messages begin with the product code KDS.
Persistent data store	The RKPDLOG sysout data set or spool file contains the information and error messages related to the handling of persistent data stores. To dump this log, follow the procedures described for RKLVLOG in the sections that follow.

Using the Log and Trace Analyzer tool

Tivoli Monitoring Services includes a Log and Trace Analyzer tool that helps you view, analyze, and correlate log files. You can evaluate event and error logs with time synchronization.

Launch the Log and Trace Analyzer tool from the Tivoli Enterprise Portal Event Tools view. You can then use the tool to view logs from the Tivoli Enterprise Portal Server or Tivoli Enterprise Monitoring Server on a distributed system, or the RKLVLOG from a monitoring agent or monitoring server on z/OS.

In addition to the Log and Trace Analyzer, specialized OMEGAMON adapters are provided to aid in problem determination for some of the more common problems that you might experience when using Tivoli Monitoring Services (Tivoli Enterprise Portal, Tivoli Enterprise Portal Server, and Tivoli Enterprise Monitoring Server). The OMEGAMON adapters process application log files and transform their contents into a common format for logging, management, and problem determination.

You can find more information about the Log and Trace Analyzer at http://www.ibm.com/developerworks/autonomic/probdet.html. OMEGAMON adapters and associated documentation are available for download from http://www.ibm.com/software/tivoli/opal?NavCode=1TW10TM2U. The Web site is updated as additional adapters become available.

Submitting problems to IBM Software Support

For information about submitting problems to IBM Software Support, see Appendix B, “Support information,” on page 185.

Summary: collecting problem information

If you have a problem that you are unable to solve by referring to this book and to *IBM Tivoli Monitoring: Problem Determination Guide*, gather the following information about the problem and contact IBM Software Support for further assistance. The IBM Support Assistant can help you gather and submit the required information about the problem. See Appendix B, “Support information,” on page 185.

- Monitored application file.
- Appropriate RAS1 trace output.
- Description of the operation scenario that led to the problem.
- Incorrect output, such as Tivoli Enterprise Portal screen prints or a description of what you observed, if applicable.
- Log files from failing systems. You can collect all logs or logs of a certain type, such as RAS trace logs or message logs.
- Application information, such as version number and patch level.
- Operating system version number and patch level.
- Messages and other information displayed on the screen.
- Version number of the following components of the monitoring environment:
  - Tivoli Enterprise Portal client. Select **About Tivoli Enterprise Portal ...** from the **Help** menu.

  - Tivoli Enterprise Portal Server and Tivoli Enterprise Monitoring Server on distributed systems. Also provide the IBM Tivoli Monitoring patch level, if available.
  - On Windows systems, you can find the version number and patch level in the **Version** column of Manage Tivoli Monitoring Services.
  - On Linux and UNIX systems, you can find the version number and patch level in the .ver file for individual product components in the *Install_dir*/registry subdirectory.
- Tivoli Enterprise Monitoring Server on z/OS. You can find the version number and patch level in the KDSENV member of the RKANPARU data set.
- Monitoring agent.

For more information about collecting problem information, see *IBM Tivoli Monitoring: Problem Determination Guide* for distributed components and Chapter 14, "Setting up a trace on a z/OS system," on page 159 for z/OS components.

Chapter 12. Troubleshooting installation and configuration problems

This chapter provides information about problems that might be caused by installation or configuration errors. Some of these problems show up during initialization of the IBM Tivoli Decision Support for z/OS monitoring agent or of one of the components of Tivoli Monitoring Services. Other problems show up in the Tivoli Enterprise Portal, either in the Navigator or in the product workspaces.

Tivoli Enterprise Portal Server installation or initialization failures on Windows

Many problems with installation and initialization of the Tivoli Enterprise Portal Server on Windows result from DB2 Universal Database (UDB) initialization or password errors.

Tivoli Enterprise Portal Server cannot start because DB2 UDB is not running

If DB2 UDB is not running, the Tivoli Enterprise Portal Server cannot start, and users attempting to log on to the Tivoli Enterprise Portal receive this message:

```
KFWITM392E Internal error occurred during logon.
```

On a Windows workstation, you can check the status of DB2 UDB by looking at the system tray. If the DB2 button is green, DB2 is running. If the button is red, start DB2 by right-clicking the button and selecting **Start**.

User account password errors

DB2 UDB requires the following Windows user accounts:

db2admin
: Added when you install DB2 UDB and required by the OMEGAMON Platform installer when you configure the Tivoli Enterprise Portal Server (**TEPS**) data source.

TEPS
: Added during Tivoli Enterprise Portal Server installation for creating the Tivoli Enterprise Portal Server data source.

Problems can result from password errors in the two user accounts:

- If you change the **db2admin** password after DB2 UDB installation, you might receive error messages when you try to install the Tivoli Enterprise Portal Server. If your Local Security Settings require you to change the password, wait to do so until you finish installing the Tivoli Enterprise Portal Server.
- If you change the **db2admin** password after you install and configure Tivoli Enterprise Portal Server, the Tivoli Enterprise Portal Server might not initialize correctly the next time it is started. Even if the **Manage Tivoli Monitoring Services** window indicates that the Tivoli Enterprise Portal Server status is **Started**, a user logging on to Tivoli Enterprise Portal client cannot connect. Check for SQL exceptions in the Tivoli Enterprise Portal Server log.

Changing the Tivoli Enterprise Portal Server database user account password

If your Windows environment requires you to change passwords after you install and configure Tivoli Enterprise Portal Server, follow these steps to change the Tivoli Enterprise Portal Server database user account password:

1. On the Windows workstation where the Tivoli Enterprise Portal Server is installed, be sure you are logged on with an ID that has local Administrator authority.
2. Select **Start > Programs > IBM Tivoli Monitoring > Manage Tivoli Monitoring Services**.
3. Right-click **Tivoli Enterprise Portal Server** and select **Advanced > Utilities > Build TEPS Database** from the context menu.
4. Click **DB2** to open the **TEPS Data Source Config Parameters** window.
5. Enter the **db2admin** account password.
6. Specify a new password for the Tivoli Enterprise Portal Server database user account.

Tip: To have one less password to remember, you can use the same password for the **db2admin** account and the Tivoli Enterprise Portal Server database user account (**TEPS**). If the Local Security Settings on the Windows system require complex passwords, you must use a password that fits the system requirements:
- Not containing the user's account name.
- Being at least six characters in length.
- Containing characters from three of the following categories:
  - English uppercase characters (A through Z)
  - English lowercase characters (a through z)
  - Base 10 digits (0 through 9) – Non-alphanumeric characters (Examples: !, $, #, %)

Installation of OMEGAMON z/OS Management Console application support failures on Windows: empty selection list

If you attempt to install the IBM Tivoli Decision Support for z/OS monitoring agent application support on a Windows system and find an empty selection list on the **Select Features** window of the InstallShield, make sure that the Tivoli Enterprise Portal Server is already installed on the workstation. This is the required order for installing distributed components:

DB2 Universal Database (DB2 UDB) Workgroup Server Edition
You can install DB2 UDB from the installation CDs which need to be obtained separately to the IBM Tivoli Decision Support for z/OS product package.

Tivoli Enterprise Portal Server
You can install the Tivoli Enterprise Portal Server from the IBM Tivoli Monitoring Services CDs which need to be obtained separately to the IBM Tivoli Decision Support for z/OS product package. If you want to install the Tivoli Enterprise Monitoring Server and Tivoli Enterprise Portal desktop client on the same system as the Tivoli Enterprise Portal Server, you can install them at the same time.

IBM Tivoli Decision Support for z/OS monitoring agent application support
You can install the IBM Tivoli Decision Support for z/OS monitoring agent

application support either from downloaded files or from the *IBM Tivoli Decision Support for z/OS monitoring agent Application Support* CD included in the product package.

For detailed instructions on installing and configuring the product components, refer to the installation and configuration chapters above.

Linux and UNIX installation and configuration problems

This section discusses problems specific to the installation and configuration of components on Linux and UNIX systems.

Preventing configuration problems on Linux and UNIX systems

To prevent problems on Linux and UNIX systems, perform installation and configuration steps in this order:

1. Install and configure the Tivoli Monitoring Services (IBM Tivoli Monitoring) components:
   - Tivoli Enterprise Monitoring Server (if you want a monitoring server on the local Linux or UNIX system)
   - Tivoli Enterprise Portal Server
   - Tivoli Enterprise Portal client

   Follow the instructions in the *IBM Tivoli Monitoring: Installation and Setup Guide*.
2. Stop all components.
3. Install the IBM Tivoli Decision Support for z/OS monitoring agent application support.

   Installing application support on a Linux or UNIX system is a looped procedure, with four iterations:
   - Installing application support on the operating system.
   - Installing application support on the browser client.
   - Installing application support on the portal server.
   - Installing application support on the monitoring server (if the monitoring server is on the local Linux or UNIX system).

   Application support can be installed on only one component at a time. See Chapter 7, “Setting up and using the Configuration Tool,” on page 91 for detailed information on this process.
4. Start the monitoring server:

   ```
   ./itmcmd server start tems_name
   ```

   where *tems_name* is the node ID of the monitoring server. On Linux and UNIX systems, you can find the value of CMS_NODEID in the KBBENV file located in the *install_dir*/tables subdirectory.
5. Activate application support on the monitoring server:

   ```
   ./itmcmd support -t tems_name do
   ```

   The two-character product code `do` indicates the IBM Tivoli Decision Support for z/OS monitoring agent.
6. Stop and restart the monitoring server:

   ```
   ./itmcmd server stop tems_name
   ./itmcmd server start tems_name
   ```
7. Stop the portal server:

   ```
   ./itmcmd agent stop cq
   ```
8. Reconfigure the portal server with the new agent information:

```
./itmcmd config -A cq
```

Tip: If you already configured the portal server after installing it, you can press **Enter** at each prompt to accept the previously entered parameters.

9. Reconfigure the portal client with the new agent information:

```
./itmcmd config -A cj
```

Hover help is not displayed in the Tivoli Enterprise Portal on a Linux system

If the IBM Tivoli Decision Support for z/OS monitoring agent help system does not function properly on a Linux system, make sure you have completed all the steps of installing and configuring the IBM Tivoli Decision Support for z/OS monitoring agent application support. See "Preventing configuration problems on Linux and UNIX systems" on page 153 for more information.

No Data displayed in the predefined IBM Tivoli Decision Support for z/OS workspaces

After you complete all installation and configuration tasks for the IBM Tivoli Decision Support for z/OS monitoring agent and have started the Monitoring Agent, if you receive no table or bar chart data in the predefined workspaces this may indicate a data collector problem when accessing the IBM Tivoli Decision Support for z/OS DB2 database. In this case, complete the following steps to diagnose and correct the problem:

1. Check the RKLVLOG for the IBM Tivoli Decision Support for z/OS monitoring agent to determine that it has successfully connected to the Tivoli Enterprise Management Server. If no connection has been established, the monitoring agent name will be grayed out in the navigator tree of the Tivoli Enterprise Portal client.

   Also check the RKLVLOG for any error messages which may have been logged by the monitoring agent when attempting to gather data from the IBM Tivoli Decision Support for z/OS DB2 database.

2. Verify that the connection variables that are used by the IBM Tivoli Decision Support for z/OS monitoring agent to query DB2 data from the IBM Tivoli Decision Support for z/OS database are correct for your system. These environment variables can be found in the KDOENV member in the *&hilev*.RKANPARU library and are described below:

   KDO_DB2_SYSTEM
   This is the DB2 Subsystem name of the Tivoli Decision Support for z/OS database. This required field can be 4 alphanumeric characters. The first character must be alphabetic.

   Example:

   ```
   KDO_DB2_SYSTEM=DE82
   ```

   KDO_DB2_PREFIX
   This is the DB2 table prefix for the Tivoli Decision Support for z/OS data tables. This required field can be 8 alphanumeric characters. The first character must be alphabetic. This value is customized when Tivoli Decision Support for z/OS is installed.

   Example:

   ```
   KDO_DB2_PREFIX=DRL
   ```

KDO_DB2_PREFIX_*

If Tivoli Decision Support for z/OS has been configured to have different components installed in different databases, you will have to create an individual DB2 table prefix for each of the different attribute groups that can be displayed by the monitoring agent. By setting the KDO_DB2_PREFIX_* environment variables and setting the KDO_DB2_PREFIX (specified above) to null, it will use the individual values rather than that of the global KDO_DB2_PREFIX environment variable. Note however, that if the KDO_DB2_PREFIX global DB2 table prefix has any value set in it, it will use this value over the individual values that might have been set in the KDO_DB2_PREFIX_* environment variables.

Example:

```
KDO_DB2_PREFIX=
KDO_DB2_PREFIX_CICS=DRL
KDO_DB2_PREFIX_COUPLING_FACILITY=DRL
KDO_DB2_PREFIX_DB2=DRLDB2
KDO_DB2_PREFIX_DEVICE=DRL
KDO_DB2_PREFIX_DFSMS=DRL
KDO_DB2_PREFIX_IMS=DRLIMS
KDO_DB2_PREFIX_JOB_STEP_ACCOUNTING=DRL
KDO_DB2_PREFIX_LOGICAL_PARTITION=DRL
KDO_DB2_PREFIX_SYSTEM=DRL
KDO_DB2_PREFIX_TCPIP=DRL
KDO_DB2_PREFIX_WORKLOAD=DRL
KDO_DB2_PREFIX_ZLINUX=DRLZLX
```

KDO_DB2_PLAN

This is the DB2 plan name for program DRLPSQLX. The plan name is specified when Tivoli Decision Support for z/OS is installed.

Example:

```
KDO_DB2_PLAN=DRLPLAN
```

KDO_DB2_MAXROWS

This is the maximum number of rows to return from a single DB2 SQL statement. This parameter can be used to restrict the quantity of data returned by DB2. The default value is 10000.

Example:

```
KDO_DB2_MAXROWS=10000
```

KDO_DB2_LOADLIB

This is the DB2 load module data set. This required field can be up to 44 alphanumeric characters, and specifies the name of the SMP/E target library data set into which the DB2 load modules were installed.

Example:

```
KDO_DB2_LOADLIB=DB2.V810.SDSNLOAD
```

KDO_TDS_LOADLIB

This is the Tivoli Decision Support for z/OS load module data set. This required field can be up to 44 alphanumeric characters, and specifies the name of the SMP/E target library data set into which the Tivoli Decision Support for z/OS load modules were installed.

Example:

```
KDO_TDS_LOADLIB=TDSDEV.V180.SDRLLOAD
```

3. View the DRLOUT for the monitoring agent started task. The DRLOUT sysout data set or spool file contains information and error messages related to the

SQL queries that the monitoring agent is performing against the IBM Tivoli Decision Support for z/OS DB2 database. If any SQL errors have occurred when the monitoring agent queried the DB2 database for data, then the SQL code will be displayed in here.

For example, an error will occur if the DB2 views which are required by the IBM Tivoli Decision Support for z/OS monitoring agent have not been defined. This will result in an SQL code of -204 being displayed in the DRLOUT sysout dataset or spool file.

If the DRLOUT sysout data set or spool file does not exist then no errors have been captured during the execution of any SQL queries to collect data for the monitoring agent from the IBM Tivoli Decision Support for z/OS DB2 database.

4. If no errors have been found in the RKLVLOG or DRLOUT for the monitoring agent, view the logs for the Tivoli Enterprise Management Server and Tivoli Enterprise Portal Server. Likely causes of problems here are the IBM Tivoli Decision Support for z/OS monitoring agent application support files not being correctly installed on the IBM Tivoli Monitoring components. See Chapter 9, “Installing and configuring the distributed components,” on page 121 and review your installation procedure.

U200 Port in use message found in RKLVLOG, indicating an incorrect default port

After you complete all installation and configuration tasks for the IBM Tivoli Decision Support for z/OS monitoring agent and try to start the monitoring agent, you might find the following abend message in RKLVLOG, indicating a connection failure:

```
U200 Port in use
```

A possible cause of this problem is that the port defined for communication among the Tivoli Monitoring Services components is already reserved for a different application in the PORT statement of the TCP/IP profile. In that case, complete the following steps to correct the problem:

1. Verify that the existing port reservation is no longer needed, or choose a different port for communication among the Tivoli Monitoring Services components.
2. Edit your TCP/IP profile to reserve the port for the Tivoli Enterprise Monitoring Server started procedure, or change the configuration settings for the portal server (on a Windows, Linux, or UNIX system) and monitoring agent (on a z/OS system) to communicate with the Tivoli Enterprise Monitoring Server on a different port.
3. Stop and restart the monitoring server, monitoring agent, and portal server.

Chapter 13. Troubleshooting security problems

This chapter provides information about problems that might be caused by security system or password incompatibilities, or by insufficient levels of authority.

Tivoli Enterprise Monitoring Server and Tivoli Enterprise Portal Server cannot communicate

The IBM Integrated Cryptographic Service Facility (ICSF, called Global Security Kit or GSKit on distributed systems) provides a robust encryption and decryption scheme for stored passwords in the portal server and monitoring server components. If ICSF is not installed on a z/OS system where a hub monitoring server is configured, the monitoring server uses an alternative, less secure encryption scheme. However, communication with the portal server requires ICSF.

The following messages are displayed when the portal server cannot connect to the monitoring server because ICSF is not installed:

```
Call to KLE_CryptoGetFP failed with exit code 8.
Cannot get CSNBXAE function pointer
Logon validation did not complete - system error.
```

Users attempting to log on to the portal client see this message:

```
KFWITM215E Unable to Process Logon Request
```

Perform the following steps so that the portal server can connect to a monitoring server on a z/OS system without ICSF:

1. When you specify configuration values for the hub monitoring server on z/OS, answer **N** to the prompt **Integrated Cryptographic Service Facility (ICSF) installed?**
2. After the monitoring server has been configured and is running, modify the portal server configuration to use the older, less robust encoding algorithm used by the hub monitoring server in the absence of ICSF:
   a. In a text editor, edit the file **kfwenv** in *drive*:\IBM\ITM\CNPS.
   b. In a line by itself, type the text `USE_EGG1_FLAG=Y`.
   c. Save the file and exit.
   d. Stop and restart the portal server.

Monitoring Agent abends during initialization

The IBM Tivoli Decision Support for z/OS monitoring agent requires that all runtime load libraries concatenated in the STEPLIB DDNAME and in the RKANMODL DDNAME of the monitoring agents started task are APF-authorized. If this is not the case during initialization of the monitoring agent you may receive an abend code S000 U0012. In your log for the started task you will see the following messages:

```
KLVST005 MVS JOBSTEP AUTHORIZATION REQUIRED
KLVST001 CANDLE ENGINE INITIALIZATION ERROR(S), ABEND U0012
```

If you use APF authorization, add the following runtime load libraries to your list of APF-authorized libraries:

- *&rhilev.&midlev.&rtename*
- *&rhilev.&midlev.*RKANMOD

- *&rhilev.&midlev.*RKANMODL
- DB2 load module data set

  This will also be specified in the KDO_DB2_LOADLIB environment variables in the KDOENV member in the *&hilev*.RKANPARU library.
- Tivoli Decision Support for z/OS load module data set

  This will also be specified in the KDO_TDS_LOADLIB environment variables in the KDOENV member in the *&hilev*.RKANPARU library.

Chapter 14. Setting up a trace on a z/OS system

Trace logs capture information about the operating environment to help you diagnose problems when components fail to operate as intended. The principal log type is the reliability, availability, and serviceability (RAS1) trace log. When the monitoring agents and Tivoli Monitoring Services components are initialized, RAS1 is one of the first processes started. RAS logs are in the English language only. You can set up RAS tracing for the monitoring agents, Tivoli Enterprise Monitoring Server, and Tivoli Enterprise Portal Server.

The default level of tracing depends on the component and operating system. For the monitoring agents on z/OS, the default level is KBB_RAS1=ERROR, which means that only error messages are captured. This is the setting for minimal tracing. When you report a problem, IBM Software Support might ask you to enable a more in-depth and detailed form of tracing, such as one of those discussed under "Syntax for RAS1 traces" on page 160.

IBM Software Support uses the information captured by trace logging to trace a problem to its source or to determine why an error occurred. The default configuration for trace logging, such as the level of trace logging, depends on the source of the trace logging. Trace logging is always enabled.

Tip: Overhead (CPU and I/O) associated with detailed RAS1 tracing might degrade performance of the monitoring agent. Restore RAS1 tracing for the monitoring agent to the default level KBB_RAS1=ERROR after you complete problem diagnosis.

You can also use communications traces during TCP/IP initialization to help diagnose problems in connections between the monitoring agent and the monitoring server. See "Setting up communications tracing."

This chapter provides instructions for setting up traces on z/OS components for your own use and to forward to IBM Software Support.

Setting up communications tracing

Communications tracing during TCP/IP initialization is controlled by the KDC_DEBUG environment variable. To obtain the level of tracing required for the TCP/IP initialization messages to be recorded in the RAS1 log, add the string KDC_DEBUG=Y to member KDOENV for the IBM Tivoli Decision Support for z/OS monitoring agent or to member KDSENV of RKANPARU for the Tivoli Enterprise Monitoring Server.

Possible values for KDC_DEBUG are:

Y The data flow between the monitoring agent and monitoring server during TCP/IP initialization is recorded, including data packages sent and received. When **KDC_DEBUG=Y** is active in the environment during initialization of TCP/IP services for this address space, you can confirm successful initialization of TCP/IP by looking for one of the following messages in RKLVLOG:

```
"KDE1I_OpenTransportProvider") Transport opened: socket/ip.tcp
"KDE1I_OpenTransportProvider") Transport opened: socket/ip.pipe
"KDE1I_OpenTransportProvider") Transport opened: socket/ip.udp
```

N The data flow between the monitoring agent and monitoring server during TCP/IP initialization is not recorded. This is the default and the recommended setting for normal operation.

See the *IBM Tivoli Monitoring: Problem Determination Guide* for a list of environment variables associated with other components.

Setting up RAS1 tracing

RAS1 tracing is the primary diagnostic tool for product components. It is provided by the KBB library service and is set either in the IBM Tivoli Monitoring Service Console interface or by a more direct method of modifying the KBB_RAS1 parameter. RAS1 messages are sent to STDOUT and redirected to the files shown in Table 17 on page 177.

RAS1 trace log files can grow very large with the wrong amount of filtering. Be careful with the levels of tracing that you specify.

Syntax for RAS1 traces

This syntax is used to specify a RAS1 trace in the K*pp*ENV file (where *pp* is the product code: **DO** for the IBM Tivoli Decision Support monitoring agent or **DS** for the Tivoli Enterprise Monitoring Server). After you add this command to the K*pp*ENV file, stop and restart the address space for the command to take effect. After that, it remains in effect for the life of the address space. To end the trace, edit the K*pp*ENV file again to reset the trace level, and stop and restart the address space.

An IBM Software Support representative can tell you the values to set for the RAS1 trace parameters.

The basic syntax of the RAS1 trace command is:

```
KBB_RAS1=global_class(COMP:component_type)(ENTRY:entry_point)
__(UNIT: unit_name,class)
```

where:

global_class
Indicates the level of tracing that you want. This is a global setting that applies to all RAS1 filters in the process. If you set this global class by itself, it is global in scope and the trace cannot filter on any of the other keywords. Separate combined classes with a space. The following values are possible. Valid abbreviations are in parentheses.

- **ERROR (ER):** returns severe error messages only (this is the default for most applications).
- **STATE (ST):** records the condition or current setting of flags and variables in the process. If state tracing is enabled, you can see the current state of particular variables or flags as the process is running.
- **FLOW (FL):** causes a message to be generated at an entry or exit point of a function.
- **DETAIL (DE):** produces a detailed level of tracing.
- **INPUT (IN):** records data created by a particular API, function, or process.

- **ALL:** causes all available messages to be recorded. This setting combines all the other forms of tracing.

COMP
Indicates that the trace includes a component type. The COMP keyword is used to trace groups of routines related by function (or component). Use this keyword only at the explicit request of an IBM Software Support representative.

component_type
Identifies a component type. An IBM Software Support representative can tell you what value to specify.

ENTRY
Narrows a filtering routine to specify a specific ENTRY POINT. Since multiple entry points for a single routine are rare, use this keyword only at the explicit request of an IBM Software Support representative.

entry_point
Represents the name of the entry point. An IBM Software Support representative can tell you what value to specify.

UNIT Indicates that the trace is to look for a match between the compilation unit dispatched and the fully or partially qualified compilation unit specified on the RAS1 statement. A match results in a trace entry.

unit_name
Represents the name of the compilation unit. In most instances, this name defines the component that is being traced. The value is likely to be the three-character component identifier for the monitoring agent (**KDO** for the IBM Tivoli Decision Support for z/OS monitoring agent).

class One of the same values specified for *global_class* but, because of its position inside the parentheses, narrowed in scope to apply only to the *unit_name* specified.

Note: The default setting for monitoring agents on z/OS is KBB_RAS1=ERROR, meaning that only error tracing is enabled. You can specify any combination of UNIT, COMP, and ENTRY keywords. No keyword is required. However, the RAS1 value you set with the global class applies to all components.

Example: Tracing monitoring agent requests to and answers from the monitoring server

To show monitoring agent requests to and answers from the Tivoli Enterprise Monitoring Server, specify this trace:

```
KBB_RAS1=ERROR (UNIT:KRA ST ERR)
```

The unit values `ST` and `ERR` indicate collection of state and error information for a monitoring agent infrastructure component (KRA).

Note: Use this type of trace only for debugging a specific problem, because the settings greatly increase the number of messages generated by the monitoring agent. With this type of trace, messages include a detailed dump of all rows of data that pass filtering: attribute names and values, request names, table names, and collection intervals. Be sure to disable this resource-intensive form of tracing immediately after you complete the trace.

Setting RAS1 trace levels by editing RKANPARU

One of the simplest ways to set trace levels for a monitoring agent on z/OS is to edit the RKANPARU (K*pp*ENV) member, where *pp* is the product code (DO for the IBM Tivoli Decision Support for z/OS monitoring agent). The text in bold shown in the following screen capture is an example of what an IBM service representative might ask you to add to this member.

```
EDIT         RKANPARU(KDOENV)
Command ===>                                                Scroll ===>CSR
******************************** Top of Data ******************************
000001 KDE_TRANSPORT=\
000002    SNA.PIPE PORT:135 USE:N\
000003    IP6.PIPE PORT:60001 USE:N\
000004    IP6.UDP PORT:60001 USE:N\
000005    IP.SPIPE PORT:3660 USE:N\
000006    IP6.SPIPE PORT:3660 USE:N\
000007    IP.PIPE PORT:60001\
000008    IP.UDP PORT:60001
000009 KBB_RAS1=ERROR (UNIT:KDO ALL)
000010 CT_CMSLIST=\
000011 IP.PIPE:n.nn.nnn.nn;\
000012 IP.UDP:n.nn.nnn.nn;
000013 CTIRA_STANDALONE=N
000014 KDO_DB2_SYSTEM=DE82
000015 KDO_DB2_PREFIX=DRL
000016 KDO_DB2_PLAN=DRLPLAN
000017 KDO_DB2_MAXROWS=10000
000018 KDO_DB2_LOADLIB=DB2.V810.SDSNLOAD
000019 KDO_TDS_LOADLIB=TDSDEV.V180.SDRLLOAD
000020 CTIRA_IP_PORT=0
000021 LANG=en_US.ibm-037
******************************** Bottom of Data ***************************
```

Setting RAS1 trace levels dynamically from the IBM Tivoli Monitoring Service Console

You can also use the IBM Tivoli Monitoring Service Console to set trace levels for monitoring agents on z/OS, as well as for a Tivoli Enterprise Monitoring Server on z/OS or for distributed components. Using the service console, you can read logs and turn on traces for remote product diagnostics and configuration.

The service console is uniquely identified by its service point name. All service consoles for a host are linked and presented on the IBM Tivoli Monitoring Service Index for that host. You can perform operations on a specific component process by selecting the service console associated with the service point name of the component.

Starting the service console

Use the following procedure to start the service console.

1. Start Internet Explorer (Version 5 or higher).
2. In the **Address** field, type the URL for the Tivoli Enterprise Portal browser client: http://hostname:1920/*hostname*:1920 where *hostname* specifies the system where the Tivoli Enterprise Portal Server is installed. If the service console is not displayed, a system administrator might have blocked access to it. See the *IBM Tivoli Monitoring: Problem Determination Guide* for information about blocking access to the service console.
3. On the **IBM Tivoli Monitoring Service Console** window, select the desired component process (service point name).
4. Click **OK**.

In secure environments, you need a valid user ID and password to proceed.

You can issue service console commands in the command input area. For a list of available commands, type a question mark (?) and click **Submit**.

Starting the service console

The service console supports the following commands, most of them useful for problem determination:

bss1 Manages BSS1 (Basic System Services). This command is paired with one of the following sub-commands:

listenv
Display the resident ITMS:Engine variables

getenv
Display environment variables

setenv Assign an environment variable

info Display BSS1_Info() data

config Manage configuration variables

config Modifies the settings of the ITMS: Engine debug environment variables: RES1_DEBUG, KDH_DEBUG, KDC_DEBUG, and KDE_DEBUG. For example, the following **config** command alters the setting of KDC_DEBUG:

```
CONFIG KDC_DEBUG=Y
```

http Displays HTTP server management.

kdcstat
Displays the status of the KDC remote procedure call (RPC) service component.

ras1 Manages RAS1 (Reliability, Availability, and Serviceability). This command is paired with one of the following sub-commands:

log Display RAS1 log capture buffer

list List the RAS1 filters

ctbld Display the resident CTBLD data

units Display the registered compilation units

set Display the RAS1 filters

You can use the RAS1 command without operands to view the current ITMS:Engine log capture buffer. When you supply operands with the RAS1 command, the operands are assumed to be keywords applicable to the KBB_RAS1 environment variable.

The RAS1 command is especially useful for dynamically enabling and disabling RAS1 traces. Often the documentation requests of IBM Software Support conflict with your availability requirements. The RAS1 command can be used to alter KBB_RAS1 tracing parameters dynamically without the need to recycle the product. For example, to enable the standard IRA traces, you can issue the following service console command:

```
RAS1 set error (unit:kpx all) (unit:kra all)
```

After you capture this trace, you can disable it with the following service console command:

```
RAS1 set error (unit:kpx error) (unit:kra error)
```

This command restores the RAS1 logging level from ALL to ERROR for units KPX and KRA.

res1 Displays the status of RES1 Logical Resource Manager

Using the Configuration Tool to set trace levels

When you use the Configuration Tool to configure a Tivoli Enterprise Monitoring Server or a monitoring agent on z/OS, you can specify the level of trace information collected. For the monitoring server, you specify trace levels on the **Specify Advanced Configuration Values** panel. For the monitoring agent, you specify trace levels on the **Specify Advanced Agent Configuration Values** panel. For information about these panels, see the previous installation and configuration chapters and the *IBM Tivoli Monitoring: Configuring IBM Tivoli Enterprise Monitoring Server on z/OS*.

Setting trace levels for the monitoring server in the Configuration Tool

The **Specify Advanced Configuration Values** panel for the monitoring server provides several parameters for setting up logging and tracing.

Enable startup console messages
Set this parameter to **Y** if you want a SYSLOG message on the console to indicate when the monitoring server finishes initializing. The default is **Y**.

Enable communications trace
Set this parameter to **Y** if you want KDC_DEBUG=Y as the override setting in the KDSENV member of RKANPARU. Otherwise, the default setting of KDC_DEBUG=N is used. This default parameter instructs the data communications layer to report communications problems using a minimal, summary format. This parameter is intended for stable applications in production. Note that the default KDC_DEBUG=N generates standard RAS1 trace data in the monitoring server RKLVLOG, in addition to the summary information diagnosing possible timeout conditions.

The following settings report on data communications problems:

- KDC_DEBUG=N: minimal tracing (default)
- KDC_DEBUG=Y: full-packet tracing
- KDC_DEBUG=D: KDC_DEBUG=Y plus STATE & FLOW tracing
- KDC_DEBUG=M: KDC_DEBUG=D plus INPUT & OUTPUT HELP tracing
- KDC_DEBUG=A: KDC_DEBUG=M plus all format tracing

Do not set KDC_DEBUG=A unless directed by an IBM Software Support representative.

Enable storage detail logging
Set this parameter to **Y** to enable storage allocation detail logging. You can use the storage detail command output to analyze storage use in the monitoring server address space. Specifying **Y** generates the second EVERY command in the KDSSTART member of RKANCMDU.

To disable storage detail logging, set this parameter to **N**, which generates the second EVERY command as a comment. To control storage detail logging further, you can also dynamically issue the following modify command to the CANSDSST started task:

```
==> /F CANSDSST,STORAGE D
```

This modify command is useful if the monitoring server is already running with storage detail logging disabled. Issuing the modify command activates storage detail logging without recycling the monitoring server. The default is **Y**.

If you set this parameter to **Y**, you must also define the times for storage detail logging and flushing the VSAM buffers.

- For **Storage detail logging**, set the interval to monitor storage. The interval values are written as part of the second EVERY command in the KDSSTART member of RKANCMDU. The default is 0 hours (*hh*) and 60 minutes (*mm*).
- For **Flush VSAM buffers**, set the interval to force all deferred VSAM writes to DASD. The interval values are written as part of the command in the KDSSTART member of RKANCMDU. The default is 0 hours (*hh*) and 30 minutes (*mm*).

Setting trace levels for the monitoring server in the Configuration Tool

The **Specify Advanced Agent Configuration Values** panel provides several parameters for setting up logging and tracing.

Enable startup console messages
Set this parameter to **Y** if you want a SYSLOG message on the console to indicate when the monitoring agent finishes initializing.

Enable WTO messages
Set this parameter to **Y** if you want write-to-operator (WTO) messages logged.

Storage detail logging interval
Set the interval (*hh*:*mm*) to monitor storage. The interval values are written as part of the second EVERY command in the KHLAGS member of RKANCMDU. The default is 30 minutes (00:30).

Flush VSAM buffers interval
Set the interval (*hh*:*mm*) to force all deferred VSAM writes to DASD. The interval values are written as part of the command in the KHLSTART member of RKANCMDU. The default is 30 minutes (00:30).

Capturing z/OS logs to send to IBM Software Support

You can view the RKLVLOG for a monitoring agent or monitoring server on z/OS online, or you can save the log to a file. To save a log to a file rather than viewing the log online, follow these tasks:

- "Saving the contents of an RKLVLOG"
- "Ending one RKLVLOG and starting another" on page 167
- Submitting problems to IBM Software Support

Saving the contents of an RKLVLOG

To save the information in your z/OS logs (such as RKLVLOG), use the System Display and Search Facility (SDSF). Follow these instructions to use SDSF to capture (in this example) the RKLVLOG associated with any running task in your monitoring agent.

1. From ISPF, select the SDSF option.
2. Enter the following on the command line:

```
taskname
```

where *taskname* is the name of the procedure whose log you are trying to display and capture. For example, entering `st cansdo` on the command line results in display of the IBM Tivoli Decision Support for z/OS monitoring agent job.

3. From the SDSF screen, enter **?** next to the name of the started task to display a list of the output files. For example, the output files for the IBM Tivoli Decision Support for z/OS monitoring agent task looks like this:

   ```
   JESMSGLG JES2
   JESJCL JES2
   JESYSMSG JES2
   SYSTSPRT CANSDO
   SYSPRINT CANSDO
   RKLVLOG CANSDO
   RKLVSNAP CANSDO
   ```

4. To print the RKLVLOG for this job to a data set, type **s** next to the RKLVLOG output file. Then, on the command line of SDSF, type:

   ```
   print d
   ```

   Press **Enter**. The `d` means that you want the file printed to a data set.

   The **SDSF Print to Data Set** panel is displayed.

```
COMMAND INPUT ===>                                            SCROLL ===> CSR


Data set name  ===> data_set_name
Member to use  ===>
Disposition    ===> NEW        (OLD, NEW, SHR, MOD)

If the data set is to be created, specify the following.
Volume serial will be used to locate existing data sets if specified.

Management class     ===>           (Blank for default management class)
Storage class        ===>           (Blank for default storage class)
  Volume serial      ===>           (Blank for authorized default volume)
  Device type        ===>           (Generic unit or device address)
Data class           ===>           (Blank for default data class)
  Space units        ===> TRKS      (BLKS, TRKS, CYLS, BY, KB, or MB)
  Primary quantity   ===> 5         (In above units)
  Secondary quantity ===> 5         (In above units)
  Directory blocks   ===> 0         (Zero for sequential data set)
  Record format      ===> VBA
  Record length      ===> 240
  Block size         ===> 3120
```

Figure 36. SDSF Print to Data Set panel

5. On this panel, type the data set name and characteristics for the file you want to print, and press **Enter**.

   You are returned to the RKLVLOG output file.

6. On the command line, specify the number of lines you want to print by entering a range large enough to include the entire file, such as:

   ```
   print 1 99999999
   ```

   Then press **Enter**. A message in the upper right corner of the panel tells you how many lines are printed.

7. Type `print close` on the SDSF command line to close the file. The log is now saved in the data set that was specified in step 5.

For more information about SDSF commands, see the *z/OS SDSF Operation and Customization* book.

Ending one RKLVLOG and starting another

When you want to recreate a problem to send it to IBM Software Support, you can use a z/OS MODIFY command to close the current RKLVLOG spool data set and open a new one. This command is issued from a z/OS console or from the Tivoli Enterprise Portal (by means of a Take Action command). The TLVLOG command manages the recording of information to RKLVLOG. The syntax and usage of this command are as follows:

```
MODIFY stcname , TLVLOG SWITCH , CLASS= class, COPIES= copies, DEST= dest,
FCB= fcb, FORM= formNO , MAXLINES= maxlinesHOLD=YES, UCS= ucs,
USER= user, WTRNAME= wtrname
```

where:

SWITCH
Dynamically allocates a new RKLVLOG file using the current values, begins recording on the new file, and closes the current RKLVLOG file, releasing it for processing by JES.

class Is the one-character JES SYSOUT class. **CLASS=A** is the ITMS:Engine startup value.

copies Is the copy count. The valid range is 1-254. **COPIES=1** is the startup value.

dest Is the 1-8 character JES SYSOUT destination. **DEST=()** is the startup value.

fcb Is the 1-4 character FCB name to be used. **FCB=()** is the startup value.

form Is the 1-4 character form name to be used. **FORM=()** is the startup value.

hold Determines whether the SYSOUT is to be placed in a JES operator hold when spun off. Specify **YES** (operator hold is requested) or **NO**. HOLD=NO is the startup value.

Note: If **HOLD=YES** is specified, you must issue the appropriate JES release command for the SYSOUT dataset to be processed.

maxlines
Is the maximum number of lines to be written to RKLVLOG, in thousands (for example, MAXLINES=2 means a maximum of 2000 lines). The valid range is 0 through 16000 (16 million lines). When this number is reached, an automatic TLVLOG SWITCH is performed, closing the current RKLVLOG and allocating a new one If the specified value is 0, there is no maximum; you must manually enter TLVLOG SWITCH to switch log files. **MAXLINES=0** is the startup value.

Note: Unlike the other values, MAXLINES takes effect immediately. If the new MAXLINES value is less than the number of lines that have already been written to the current RKLVLOG, a switch is performed immediately.

Ucs Specifies the 1-4 character UCS name to be used. **UCS=()** is the startup value.

User Is the 1-8 character user ID to which the SYSOUT is to be spooled. Ignored if **DEST** is blank. **USER=()** is the startup value.

wtrname
Is the 1-8 character external writer name to be used. **WTRNAME=()** is the startup value.

Notes:

Ending one RKLVLOG and starting another

1. The TLVLOG command performs up to three functions, depending on the keywords specified. Assuming that you select all three functions, they are performed in the following order:
   a. Updates the dynamic allocation values. With the exception of MAXLINES, these values are used when the next dynamic allocation is performed. Values are updated whenever they are coded on the command.
   b. Lists the current dynamic allocation values. This is always done.
   c. Switches RKLVLOGs. This is done only when SWITCH is specified on the command.

   You can update values and request a switch with the same command. The values are updated first, and then the switch is performed.
2. RKLVLOGs can be closed automatically after a certain number of records have been written to them. Refer to the MAXLINES keyword for more information.
3. To set up an automatic RKLVLOG switch whenever the ITMS:Engine address space is started, add the following command to your RKANCMD startup CLIST:

   ```
   TLVLOG MAXLINES=nnn
   ```

   This command causes RKLVLOG to be closed and released to JES whenever *nnn*thousands of lines have been written. If needed, you can add other values (for example, CLASS) to this command.
4. Many diagnostic messages are recorded in RKLVLOG. If you set RKLVLOG to spin off automatically, or if you explicitly switch RKLVLOG, you must ensure that the SYSOUT files are kept at least for the life of the ITMS:Engine run, in case they are required for problem solving.
5. You might want to issue a `TLVLOG SWITCH` command after a problem occurs. This spins off the RKLVLOG data related to the problem into a separate spool data set, which can be included in the problem documentation. Be sure to include all previously spun-off RKLVLOG files .
6. Because RKLVLOG is managed with standard IBM data management routines, records are buffered before being written. If you are viewing the currently active RKLVLOG with a product such as SDSF, you do not see the latest messages. Issue the command `FLUSH TLVLOG` to force the current data management buffer to be written. Do not use the `TLVLOG SWITCH` to spin off the current RKLVLOG for this purpose, as it fragments the messages recorded in RKLVLOG.
7. Unless you explicitly set a non-zero MAXLINES value, RKLVLOG never switches automatically.
8. If an error occurs when writing to RKLVLOG, ITMS:Engine issues a message and disables RKLVLOG recording. However, messages are still written to VIEWLOG and to all active operator interfaces. Depending on the error, you might be able to restart RKLVLOG by issuing a switch request.

Here are some examples of ways to use this command:

- To list the current RKLVLOG destination and values:

  ```
  tlvlog
  ```

- To establish class X and destination SYSPROG as default SYSOUT attributes, and the maximum number of lines as 20,000:

  ```
  tlvlog class=x dest=sysprog maxlines=20
  ```

- To switch to a new RKLVLOG:

  ```
  tlvlog switch
  ```

Flushing the log buffers

After a TLVLOG is switched, issuing an echo command can flush the log buffers and ensure that new messages are written to the new RKLVLOG. The ECHO command echoes any text entered back to the screen. The syntax of the ECHO command is shown below:

```
ECHO string
```

where *string* is a character string to be echoed back to the operator screen where the ECHO command was entered.

Notes:

1. Use ECHO to verify that the ITMS:Engine operator facility is functioning properly and to force all buffered messages to the log.
2. Even after an ECHO, log output might not be visible in JES3 systems, because of the way JES3 manages spool buffers.
3. Enclosing *string* in single quotes is necessary only if you want to preserve leading blanks.

Understanding and using the trace logs

When you open a trace log, you find a mix of status lines and numbered product messages. Most messages with IDs are documented in the Problem Determination Guides for each monitoring agent. You can also determine the meaning of a message by entering the message number into an Internet search engine such as Google. The information that follows helps you interpret the messages and status lines in a z/OS log.

Format of messages in a RAS1 log

A RAS1 log for a monitoring agent on z/OS includes the following information:

- Environmental information
  - Operating system and CPU data. This information is prefaced with the following string:

    ```
    pppxxmmm
    ```

    where:

    ppp Is the component prefix.

    xx Is the component code.

    mmm Is the module name.
  - Initial command line settings
- Component summary:
  - Name of the module
  - Information about where the library was loaded from
  - Date and time the module was compiled
  - Version (if this detail was specified)
- Formatted output, including entry and exit points and text strings. Entry and exit points show flow into and out of a given function. The exit shows the return code, if applicable. The text depends on the kind of trace specified. Here is an example:

```
(00D41 F9C-1{99%}:Kppmain.cpp,953,"MainWnd::MainWnd") Entry
(00D41 FD3-1{99%}:Kppmain.cpp,959,"MainWnd::MainWnd") Exit
Time,Thread,{%stack avail},pgm_name,Line#,function,text
```

As noted earlier, not all functions are RAS1-enabled, and trace level might exclude some paths.

Part 4. Appendixes

Appendix A. Mapping attributes to the Tivoli Decision Support for z/OS DB2 database

Every time a workspace is selected in the Tivoli Enterprise Portal client, the query in every workspace view will retrieve row data based on the queries filter criteria from the Tivoli Decision Support for z/OS DB2 database. This appendix details the link between the monitoring agents attribute groups and the DB2 table or views that the row data is being collected from, as well as the link between the individual attributes within each attribute group and the column names within each DB2 table or view they represent.

Attribute Groups to DB2 table names mapping

Every attribute group within the monitoring agent will correspond to a physical DB2 table or view in the Tivoli Decision Support for z/OS DB2 database. Figure 14 on page 104 details the DB2 table which is used by the monitoring agent to collect data for each attribute group when a query is run by a view in a workspace. In each case there is always a separate table for every different time period which data has been collected for.

Table 12. Attribute group mappings to Tivoli Decision Support for z/OS DB2 tables

Attribute Group	Time Period	Table name in Tivoli Decision Support for z/OS DB2 database
CICS Transactions	Hourly Daily Weekly	CICS_TRANSACTION_HKV CICS_TRANSACTION_DKV CICS_TRANSACTION_WKV
DB2 Transactions	Daily Weekly	DB2_TRANSACTION_DKV DB2_TRANSACTION_WKV
Device Statistics	Hourly	MVSPM_DEVICE_HKV
DFSMS Volume Information	Daily Monthly	DFSMS_VOLUME_DKV DFSMS_VOLUME_MKV
IMS Transactions	Hourly Daily Weekly	IMS_TRAN_HKV IMS_TRAN_DKV IMS_TRAN_WKV
Interval Job Step Accounting	Hourly Daily Monthly	MVSAC_JOBADDR1_HKV MVSAC_JOBADDR1_DKV MVSAC_JOBADDR1_MKV
Logical Partition Statistics	Hourly Daily Monthly	MVSPM_LPAR_HKV MVS_LPAR_DKV MVS_LPAR_MKV
System Statistics	Hourly Daily Monthly	MVS_SYSTEM_HKV MVS_SYSTEM_DKV MVS_SYSTEM_MKV
Coupling Facility Statistics	Hourly	MVSPM_CF_REQ_HKV
TCPIP Server Connections	Hourly Daily Weekly	TCP_SERVER_CON_HKV TCP_SERVER_CON_DKV TCP_SERVER_CON_WKV
Workload Statistics	Hourly Daily Monthly	MVS_WORKLOAD2_HKV MVS_WORKLOAD2_DKV MVS_WORKLOAD2_MKV

Table 12. Attribute group mappings to Tivoli Decision Support for z/OS DB2 tables (continued)

Attribute Group	Time Period	Table name in Tivoli Decision Support for z/OS DB2 database
zLinux Statistics	Hourly Daily Monthly	ZLINUX_CPU_HKV ZLINUX_CPU_DKV ZLINUX_CPU_MKV

Attributes to DB2 column names mapping

From each of the Tivoli Decision Support for z/OS DB2 table or views a set of columns have been selected to make up the attributes within the attribute group for the Monitoring Agent.

CICS Transactions attribute mapping

The CICS Transactions attribute group collects data from the following DB2 tables in Tivoli Decision Support for z/OS:

- CICS_TRANSACTION_HKV
- CICS_TRANSACTION_DKV
- CICS_TRANSACTION_WKV

Table 13 shows the mapping between the attribute names in the CICS Transactions attribute group and the name of the DB2 columns in the table that it represents.

Table 13. DB2 column names for CICS Transactions attributes

Attribute Name	DB2 Table Column Name	Time Periods
Date	DATE	All
Time	TIME	Hourly table only
Period Name	PERIOD_NAME	All
MVS System ID	MVS_SYSTEM_ID	All
CICS System ID	CICS_SYSTEM_ID	All
Transaction ID	TRANSACTION_ID	All
Principal Terminal Character	CHARS_PRIME_TOTAL	All
Maximum CPU Time(sec)	CPU_MAX_SEC	All
Minimum CPU Time(sec)	CPU_MIN_SEC	All
Sum CPU Time(sec)	CPU_SUM_SEC	All
Average CPU Time(sec)	AVG_CPU_SEC	All
DB2 Requests	DB2_REQS_COUNT	All
File Control Requests	FC_REQUESTS_TOTAL	All
IMS Requests	IMS_REQS_COUNT	All
Maximum Task Response Time(sec)	RESPONSE_MAX_SEC	All
Minimum Task Response Time(sec)	RESPONSE_MIN_SEC	All
Sum Task Response Time(sec)	RESPONSE_SUM_SEC	All
Average Task Response Time(sec)	AVG_RESPONSE_SEC	All

Table 13. DB2 column names for CICS Transactions attributes (continued)

Attribute Name	DB2 Table Column Name	Time Periods
Transaction Count	TRANSACTION_COUNT	All
Date	DATE	All

DB2 Transactions attribute mapping

The DB2 Transactions attribute group collects data from the following DB2 tables in Tivoli Decision Support for z/OS:

- DB2_TRANSACTION_DKV
- DB2_TRANSACTION_WKV

Table 14 shows the mapping between the attribute names in the DB2 Transactions attribute group and the name of the DB2 columns in the table that it represents.

Table 14. DB2 column names for DB2 Transactions attributes

Attribute Name	DB2 Table Column Name	Time Periods
Date	DATE	All
Period Name	PERIOD_NAME	All
MVS System ID	MVS_SYSTEM_ID	All
DB2 System ID	DB2_SYSTEM_ID	All
Correlation ID	CORRELATION_ID	All
DB2 Plan Name	DB2_PLAN	All
Unsuccessful DB2 Threads	ABNORMAL	All
Abort Count	ABORT_COUNT	All
Row Trigger Activations	ACTIV_ROW_TRIGGER	All
SQL Trigger Activations	ACTIV_SQL_TRIGGER	All
Commit Count	COMMIT_COUNT	All
Highest CPU Time Used	CPU_HIGH_USED	All
Accumulated DB2 Elapsed Time	ELAPSED_DB2_SEC	All
Total Elapsed Time	ELAPSED_SEC	All
Implicit Prepares	IMPLICIT_PREP	All
IO Wait Time for Database	IO_WAIT_DB_SEC	All
IO Wait Time for Thread	IO_WAIT_SEC	All
Successful DB2 Threads	NORMAL	All
Satisfied Prepare Requests	PREP_FND_IN_CACHE	All
Row Access to Index	ROWID_ACC_TO_IDX	All
Row Access to Table Space	ROWID_ACC_TO_TS	All
Successful Direct Row Access	ROWID_SUCC_ACC	All
Accumulated DB2 TCB Time	TCB_DB2_SEC	All
Total CPU TCB Time	TCB_SEC	All

Device Statistics attribute mapping

The Device Statistics attribute group collects data from the MVSPM_DEVICE_HKV DB2 table in Tivoli Decision Support for z/OS.

Table 15 shows the mapping between the attribute names in the Device Statistics attribute group and the name of the DB2 columns in the table that it represents.

Table 15. DB2 column names for Device Statistics attributes

Attribute Name	DB2 Table Column Name	Time Periods
Date	DATE	All
Time	TIME	All
Period Name	PERIOD_NAME	All
MVS System ID	MVS_SYSTEM_ID	All
Device Number	DEVICE_NUMBER	All
Volume Serial Number	VOLSER	All
Average Connect Time	CONNECT_AVG_MSEC	All
DASD mpl	DASD_AVG_MPL	All
Device Busy Percentage	DEV_BUSY_PCT	All
Average Wait Time	DEV_WAIT_AVG_MSEC	All
Average Disconnect Time	DISCONN_AVG_MSEC	All
Requests Serviced	IO_RATE	All
Average Pending Time	PENDING_AVG_MSEC	All
Average Queue Wait	QUE_WAIT_AVG_MSEC	All
Average Response Time	RESPONSE_AVG_MSEC	All
Average SIO Time	SIO_AVG_MSEC	All

DFSMS Volume Information attribute mapping

The DFSMS Volume Information attribute group collects data from the following DB2 tables in Tivoli Decision Support for z/OS:

- DFSMS_VOLUME_DKV
- DFSMS_VOLUME_MKV

Table 16 shows the mapping between the attribute names in the DFSMS Volume Information attribute group and the name of the DB2 columns in the table that it represents.

Table 16. DB2 column names for DFSMS Volume Information attributes

Attribute Name	DB2 Table Column Name	Time Periods
Date	DATE	All
MVS System ID	MVS_SYSTEM_ID	All
Storage Group	STORAGE_GROUP	All
Volume Serial Number	VOLSER	All
Total Volume Capacity	CAPACITY_TOTAL	All
Free Control Blocks	DS_CTRL_BLOCKS	Daily table only
Avg Free Control Blocks	DS_CTRL_BLOCKS_AVG	Monthly table only
Extent Max	EXTENT_MAX	All

Table 16. DB2 column names for DFSMS Volume Information attributes (continued)

Attribute Name	DB2 Table Column Name	Time Periods
Free Extents	EXTENTS_FREE	Daily table only
Average Free Extents	EXTENTS_FREE_AVG	Monthly table only
Fragmentation Index	FRAGMENT_INDEX	Daily table only
Average Fragmentation Index	FRAGMENT_INDEX_AVG	Monthly table only
Total Alloc Space	SPACE_ALLOC_TOTAL	Daily table only
Average Alloc Space	SPACE_ALLOC_AVG	Monthly table only
Maximum Alloc Space	SPACE_ALLOC_MAX	Monthly table only
Minimum Alloc Space	SPACE_ALLOC_MIN	Monthly table only
Total Free Space	SPACE_FREE_TOTAL	Daily table only
Total Free Space Pct	SPACE_FREE_PCT	Daily table only
Average Free Space	SPACE_FREE_AVG	Monthly table only
Average Free Space Pct	SPACE_FREE_AVG_PCT	Monthly table only
Maximum Free Space Pct	SPACE_FREE_MAX_PCT	Monthly table only
Minimum Free Space Pct	SPACE_FREE_MIN_PCT	Monthly table only
Total Free VTOC	VTOC_INDEX_RECORDS	Daily table only
Average Free VTOC	VTOC_INDEX_REC_AVG	Monthly table only

IMS Transactions attribute mapping

The IMS Transactions attribute group collects data from the following DB2 tables in Tivoli Decision Support for z/OS:

- IMS_TRAN_HKV
- IMS_TRAN_DKV
- IMS_TRAN_WKV

Table 17 shows the mapping between the attribute names in the IMS Transactions attribute group and the name of the DB2 columns in the table that it represents.

Table 17. DB2 column names for IMS Transactions attributes

Attribute Name	DB2 Table Column Name	Time Periods
Date	DATE	All
Time	TIME	Hourly table only
Transaction Name	TRANSACTION_NAME	All
Program Name	PROGRAM_NAME	All
Transaction Type	TRANS_TYPE	All
Origin IMS	ORIGIN_IMS	All
Process IMS	PROCESS_IMS	All
Aborts	ABORTS	All
Commits	COMMITS	All
Input CSQ	INPUT_CSQ	All
Input Local	INPUT_LOCAL	All
Input Seconds	INPUT_SEC	All
Output CSQ	OUTPUT_CSQ	All

Table 17. DB2 column names for IMS Transactions attributes (continued)

Attribute Name	DB2 Table Column Name	Time Periods
Output Local	OUTPUT_LOCAL	All
Output Seconds	OUTPUT_SEC	All
Output CSQ Seconds	OUTPUT_CSQ_SEC	All
Program CPU Seconds	PGM_CPU_APPROX	All
Program Switches	PGM_SWITCHES	All
Process Seconds	PROCESS_SEC	All
Response Seconds	RESPONSE_SEC	All
Responses	RESPONSES	All
SubQueue 6 Time	SQ6_TIME	All
Transaction Count	TRANSACTIONS	All
Transit Seconds	TRANSIT_SEC	All

Interval Job Step Accounting attribute mapping

The Interval Job Step Accounting attribute group collects data from the following DB2 tables in Tivoli Decision Support for z/OS:

- MVSAC_JOBADDR1_HKV
- MVSAC_JOBADDR1_DKV
- MVSAC_JOBADDR1_MKV

Table 18 shows the mapping between the attribute names in the Interval Job Step Accounting attribute group and the name of the DB2 columns in the table that it represents.

Table 18. DB2 column names for Interval Job Step Accounting attributes

Attribute Name	DB2 Table Column Name	Time Periods
Date	DATE	All
Time	TIME	Hourly table only
Period Name	PERIOD_NAME	All
MVS System ID	MVS_SYSTEM_ID	All
Job Name	JOB_NAME	All
Job Sampling Date	JOB_SAMPLING_DATE	All
SubSystem ID	SUBSYSTEM_ID	All
Blocks Transferred	BLOCKS_TRANSFERRED	All
CPU Total Seconds	CPU_TOTAL_SECONDS	All
DASD Blocks	DASD_BLOCKS	All
PA GT16MB Bytes	PA_GT16MB_BYTES	All
PA LT16MB Bytes	PA_LT16MB_BYTES	All
PagesAuxIn	PAGEINS	All
PagesAuxOut	PAGEOUTS	All
Pages Swapped In	PAGES_SWAPPED_IN	All
Pages Swapped Out	PAGES_SWAPPED_OUT	All
Tape Blocks	TAPE_BLOCKS	All

Table 18. DB2 column names for Interval Job Step Accounting attributes (continued)

Attribute Name	DB2 Table Column Name	Time Periods
Total Jobs	TOTAL_JOBS	All

Logical Partition Statistics attribute mapping

The Logical Partition Statistics attribute group collects data from the following DB2 tables in Tivoli Decision Support for z/OS:

- MVSPM_LPAR_HKV
- MVS_LPAR_DKV
- MVS_LPAR_MKV

Table 19 shows the mapping between the attribute names in the Logical Partition Statistics attribute group and the name of the DB2 columns in the table that it represents.

Table 19. DB2 column names for Logical Partition Statistics attributes

Attribute Name	DB2 Table Column Name	Time Periods
Date	DATE	All
Time	TIME	Hourly table only
Period Name	PERIOD_NAME	All
MVS System ID	MVS_SYSTEM_ID	All
LPAR Name	LPAR_NAME	All
Processor Type	PROCESSOR_TYPE	All
Processor Complex Utilization	COMPLEX_UTIL_PCT	All
Total Logical Processors	LOGICAL_PROC_TOT	All
LPAR Busy Percent	LPAR_BUSY_PCT	All
LPAR Dispatched Percent	LPAR_DISPATCH_PCT	All
LPAR Effective Disp Percent	LPAR_EFF_DISP_PCT	All
LPAR Management Percent	LPAR_MGMT_PCT	All
LPAR Spare Percent	LPAR_SPARE_PCT	All
LPROC Busy Percent	LPROC_BUSY_PCT	All
LPROC Dispatched Percent	LPROC_DISPATCH_PCT	All
LPROC Effective Disp Percent	LPROC_EFF_DISP_PCT	All
Total IIP Processors	PHY_PROC_SPP_IIP	All
Total Physical CPUs	PHYS_PROC_LPAR	All

System Statistics attribute mapping

The System Statistics attribute group collects data from the following DB2 tables in Tivoli Decision Support for z/OS:

- MVS_SYSTEM_HKV
- MVS_SYSTEM_DKV
- MVS_SYSTEM_MKV

Table 20 on page 180 shows the mapping between the attribute names in the System Statistics attribute group and the name of the DB2 columns in the table that

it represents.

Table 20. DB2 column names for System Statistics attributes

Attribute Name	DB2 Table Column Name	Time Periods
Date	DATE	All
Time	TIME	Hourly table only
Period Name	PERIOD_NAME	All
MVS System ID	MVS_SYSTEM_ID	All
Average Batch Jobs	BATCH_JOBS_AVG	All
Processor Busy Time(seconds)	CPU_BUSY_SEC	All
Max CPU Load Percent	CPU_LOAD_MAX_PCT	All
Min CPU Load Percent	CPU_LOAD_MIN_PCT	All
CPU Online Seconds	CPU_ONLINE_SEC	All
Avg Avail. Frames Central Storage	FRAMES_CS_AVG	All
Max Avail. Frames Central Storage	FRAMES_CS_MAX	Hourly table only
Min Avail. Frames Central Storage	FRAMES_CS_MIN	Hourly table only
Avg IN Address Spaces	IN_AVG	All
Avg OUT Ready Address Spaces	OUT_READY_AVG	All
Number of Page Ins	PAGEINS	All
Number of Page Outs	PAGEOUTS	All
Number of VIO Page Ins	PAGEINS_VIO	All
Number of VIO Page Outs	PAGEOUTS_VIO	All
Number of Pages Swapped In	PAGES_SWAPPED_IN	All
Number of Pages Swapped Out	PAGES_SWAPPED_OUT	All
SRB Execution Time(seconds)	SRB_SECONDS	All
Average Started Tasks	STARTED_TASKS_AVG	All
Swap Sequences	SWAP_SEQUENCES	All
Sysplex Name	SYSPLEX_NAME	All
TCB Execution Time(seconds)	TCB_SECONDS	All
Average TSO Users	TSO_USERS_AVG	All
Maximum Concurrent TSO Users	TSO_USERS_MAX	All

Coupling Facility Statistics attribute mapping

The Coupling Facility Statistics attribute group collects data from the following DB2 tables in Tivoli Decision Support for z/OS:

- MVSPM_CF_REQ_HKV

Table 21 shows the mapping between the attribute names in the Coupling Facility Statistics attribute group and the name of the DB2 columns in the table that it represents.

Table 21. DB2 column names for Coupling Facility Statistics attributes

Attribute Name	DB2 Table Column Name	Time Periods
Date	DATE	All
Time	TIME	All
Period Name	PERIOD_NAME	All
MVS System ID	MVS_SYSTEM_ID	All
Sysplex Name	SYSPLEX_NAME	All
CF Name	CF_NAME	All
Structure Name	STRUCTURE_NAME	All
Structure Type	STRUCTURE_TYPE	All
CF Model	CF_MODEL	All
CF Version	CF_VERSION	All
CF Level	CF_LEVEL	All
Request Rate per second	REQUEST_RATE	All
Synchronous Requests per second	SYNC_RATE	All
Synchronous Requests Average Time	SYNC_AVG_SERV	All
Asynchronous Requests per second	ASYNC_RATE	All
Asynchronous Requests Average Time	ASYNC_AVG_SERV	All
Changed Operations Rate	CHANGED_OP_PERC	All
Changed Operations per second	CHANGED_OP_RATE	All
Subchannel Busy Rejections per second	SUBCH_BUSY_RATE	All
Path Busy Rejections per second	PATH_BUSY_RATE	All
Delayed Requests Percent	DEL_REQUEST_PERC	All
Subchannel Busy Delays per second	SUBCH_DELAY_PERC	All
Path Busy Delays Percent	PATH_DELAY_PERC	All
Delayed Queue Requests Percent	QUEUE_DELAY_PERC	All
Delayed Dump Requests Percent	DUMP_DELAY_PERC	All
Peer Subchannel Wait Percent	PEER_WAIT_SCH_PERC	All
Peer Completion Wait Percent	PEER_WAIT_CMP_PERC	All

TCPIP Server Connections attribute mapping

The TCPIP Server Connections attribute group collects data from the following DB2 tables in Tivoli Decision Support for z/OS:

- TCP_SERVER_CON_HKV
- TCP_SERVER_CON_DKV
- TCP_SERVER_CON_WKV

Table 22 shows the mapping between the attribute names in the TCPIP Server Connections attribute group and the name of the DB2 columns in the table that it represents.

Table 22. DB2 column names for TCPIP Server Connections attributes

Attribute Name	DB2 Table Column Name	Time Periods
Date	DATE	All
Time	TIME	Hourly table only
Sysplex Name	SYSPLEX_NAME	All
MVS System ID	MVS_SYSTEM_ID	All
Sub System ID	SUB_SYSTEM_ID	All
Local IP Address	LOCAL_IP_ADDR	All
Local Port	LOCAL_PORT	All
MVS System Name	MVS_SYSTEM_NAME	All
TCPIP Stack Name	TCPIP_STACK_NAME	All
Connections	CONNECTIONS	All
Average Connection Duration	CONN_DURATION_AVG	All
Inbound Bytes(kb)	INBOUND_BYTES	All
Outbound Bytes(kb)	OUTBOUND_BYTES	All
Average Round Trip Time	ROUNDTRIP_TIME_AVG	All
Retransmissions	RETRANSMISSIONS	All

Workload Statistics attribute mapping

The Workload Statistics attribute group collects data from the following DB2 tables in Tivoli Decision Support for z/OS:

- MVS_WORKLOAD2_HKV
- MVS_WORKLOAD2_DKV
- MVS_WORKLOAD2_MKV

Table 23 shows the mapping between the attribute names in the Workload Statistics attribute group and the name of the DB2 columns in the table that it represents.

Table 23. DB2 column names for Workload Statistics attributes

Attribute Name	DB2 Table Column Name	Time Periods
Date	DATE	All
Time	TIME	Hourly table only
Period Name	PERIOD_NAME	All
Sysplex Name	SYSPLEX_NAME	All
MVS System ID	MVS_SYSTEM_ID	All

Table 23. DB2 column names for Workload Statistics attributes (continued)

Attribute Name	DB2 Table Column Name	Time Periods
Workload Type	WORKLOAD_TYPE	All
Workload Group	WORKLOAD_GROUP	All
Service Class	SERVICE_CLASS	All
Service Policy	SERVICE_POLICY	All
Service Class Period	SERV_CLASS_PERIOD	All
Service Class Type	SERV_CLASS_TYPE	All
System Name	SYSTEM_NAME	All
Subsystem ID	SUBSYSTEM_ID	All
Processor Capacity	CAPACITY_CPU_SU	All
Transactions Ended	TRANSACTIONS	All
Transactions Ended Within Goal	TRANSACTIONS_BELOW	All
Active Time all Transactions	TRAN_ACTIVE_SEC	All
Elapsed Time all Transactions	TRAN_ELAPSED_SEC	All
Execution Time all Transactions	TRAN_EXECUTION_SEC	All
Total Processor Service Units	SERVICE_UNITS_CPU	All
Total SRB Service Units	SERVICE_UNITS_SRB	All
Total Main Storage Service Units	SERVICE_UNITS_MS	All
Total IO Service Units	SERVICE_UNITS_IO	All
Total Service Units	SERVICE_UNITS_TOT	All
TCB Seconds	TCB_SECONDS	All
SRB Seconds	SRB_SECONDS	All
RCT Seconds	RCT_SECONDS	All
IO Count	IO_COUNT	All
Total Delay Samples	TOTAL_DELAY_CNT	All
Average Response Time Goal	AVERAGE_GOAL_SEC	All
Goal Percentile	GOAL_PERCENTILE	All
Goal Importance	GOAL_IMPORTANCE	All
Execution Velocity Goal(pct)	EXEC_VEL_GOAL_PCT	All
Goal Flag	GOAL_FLAG	All
IFA Seconds	IFA_SECONDS	All
IIP Seconds	IIP_SECONDS	All

zLinux Statistics attribute mapping

The zLinux Statistics attribute group collects data from the following DB2 tables in Tivoli Decision Support for z/OS:

- ZLINUX_CPU_HKV
- ZLINUX_CPU_DKV
- ZLINUX_CPU_MKV

Table 24 shows the mapping between the attribute names in the zLinux Statistics attribute group and the name of the DB2 columns in the table that it represents.

Table 24. DB2 column names for zLinux Statistics attributes

Attribute Name	DB2 Table Column Name	Time Periods
Date	DATE	All
Time	TIME	Hourly table only
Node Name	NODE_NAME	All
System Name	SYSTEM_NAME	All
Period Name	PERIOD_NAME	All
Total Measured Time(sec)	MEASURED_SEC	All
Records Collected	RECORDS_COLLECTED	All
Minimum Free Memory Pages	MEM_FREE_PAGES_MIN	All
Average Free Memory Pages	MEM_FREE_PAGES_AVG	All
Maximum Free Memory Pages	MEM_FREE_PAGES_MAX	All
Minimum CPU Usage(pct)	CPU_USAGE_PCT_MIN	All
Average CPU Usage(pct)	CPU_USAGE_PCT_AVG	All
Maximum CPU Usage(pct)	CPU_USAGE_PCT_MAX	All
Minimum Paging Rate	PAGING_RATE_MIN	All
Average Paging Rate	PAGING_RATE_AVG	All
Maximum Paging Rate	PAGING_RATE_MAX	All
Minimum Users	USERS_MIN	All
Average Users	USERS_AVG	All
Maximum Users	USERS_MAX	All
Minimum Processes	PROCESSES_MIN	All
Average Processes	PROCESSES_AVG	All
Maximum Processes	PROCESSES_MAX	All

Appendix B. Support information

If you have a problem with your IBM software, you want to resolve it quickly. This section describes the following options for obtaining support for IBM software products:

- "Searching knowledge bases"
- "Obtaining fixes"
- "Receiving weekly support updates" on page 186
- "Contacting IBM Software Support" on page 187

Searching knowledge bases

You can search the available knowledge bases to determine whether your problem was already encountered and is already documented.

Searching the information center

IBM provides extensive documentation that can be installed on your local computer or on an intranet server. You can use the search function of this information center to query conceptual information, instructions for completing tasks, and reference information.

Searching the Internet

If you cannot find an answer to your question in the information center, search the Internet for the latest, most complete information that might help you resolve your problem.

To search multiple Internet resources for your product, use the **Web search** topic in your information center. In the navigation frame, click **Troubleshooting and support** ▸ **Searching knowledge bases** and select **Web search**. From this topic, you can search a variety of resources, including the following:

- IBM technotes
- IBM downloads
- IBM developerWorks®
- Forums and newsgroups
- Google

Obtaining fixes

A product fix might be available to resolve your problem. To determine what fixes are available for your IBM software product, follow these steps:

1. Go to the IBM Software Support Web site at http://www.ibm.com/software/support/.
2. Click **Downloads and drivers** in the **Support topics** section.
3. Select the **Software** category.
4. Select a product in the **Sub-category** list.
5. In the **Find downloads and drivers by product** section, select one software category from the **Category** list.
6. Select one product from the **Sub-category** list.

7. Type more search terms in the **Search within results** if you want to refine your search.
8. Click **Search**.
9. From the list of downloads returned by your search, click the name of a fix to read the description of the fix and to optionally download the fix.

For more information about the types of fixes that are available, see the *IBM Software Support Handbook* at http://techsupport.services.ibm.com/guides/handbook.html.

Receiving weekly support updates

To receive weekly e-mail notifications about fixes and other software support news, follow these steps:

1. Go to the IBM Software Support Web site at http://www.ibm.com/support/us/.
2. Click **My support** in the upper right corner of the page.
3. If you have already registered for **My support**, sign in and skip to the next step. If you have not registered, click **register now**. Complete the registration form using your e-mail address as your IBM ID and click **Submit**.
4. Click **Edit profile**.
5. In the **Products** list, select **Software**. A second list is displayed.
6. In the second list, select a product segment, for example, **Application servers**. A third list is displayed.
7. In the third list, select a product sub-segment, for example, **Distributed Application & Web Servers**. A list of applicable products is displayed.
8. Select the products for which you want to receive updates, for example, **IBM HTTP Server** and **WebSphere® Application Server**.
9. Click **Add products**.
10. After selecting all products that are of interest to you, click **Subscribe to email** on the **Edit profile** tab.
11. Select **Please send these documents by weekly email**.
12. Update your e-mail address as needed.
13. In the **Documents** list, select **Software**.
14. Select the types of documents that you want to receive information about.
15. Click **Update**.

If you experience problems with the **My support** feature, you can obtain help in one of the following ways:

Online
Send an e-mail message to erchelp@ca.ibm.com, describing your problem.

By phone
Call 1-800-IBM-4You (1-800-426-4968).

Contacting IBM Software Support

IBM Software Support provides assistance with product defects.

Before contacting IBM Software Support, your company must have an active IBM software maintenance contract, and you must be authorized to submit problems to IBM. The type of software maintenance contract that you need depends on the type of product you have:

- For IBM distributed software products (including, but not limited to, Tivoli, Lotus®, and Rational® products, as well as DB2 and WebSphere products that run on Windows, or UNIX operating systems), enroll in Passport Advantage® in one of the following ways:

  Online

  Go to the Passport Advantage Web site at http://www.lotus.com/services/passport.nsf/ WebDocs/Passport_Advantage_Home and click **How to Enroll**.

  By phone

  For the phone number to call in your country, go to the IBM Software Support Web site at http://techsupport.services.ibm.com/guides/contacts.html and click the name of your geographic region.
- For customers with Subscription and Support (S & S) contracts, go to the Software Service Request Web site at https://techsupport.services.ibm.com/ssr/login.
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If you are not sure what type of software maintenance contract you need, call 1-800-IBMSERV (1-800-426-7378) in the United States. From other countries, go to the contacts page of the *IBM Software Support Handbook* on the Web at http://techsupport.services.ibm.com/guides/contacts.html and click the name of your geographic region for phone numbers of people who provide support for your location.

To contact IBM Software support, follow these steps:

1. "Determining the business impact"
2. "Describing problems and gathering information" on page 188
3. "Submitting problems" on page 188

Determining the business impact

When you report a problem to IBM, you are asked to supply a severity level. Therefore, you need to understand and assess the business impact of the problem that you are reporting. Use the following criteria:

Severity 1
The problem has a *critical* business impact. You are unable to use the program, resulting in a critical impact on operations. This condition requires an immediate solution.

Severity 2
The problem has a *significant* business impact. The program is usable, but it is severely limited.

Severity 3
The problem has *some* business impact. The program is usable, but less significant features (not critical to operations) are unavailable.

Severity 4
The problem has *minimal* business impact. The problem causes little impact on operations, or a reasonable circumvention to the problem was implemented.

Describing problems and gathering information

When describing a problem to IBM, be as specific as possible. Include all relevant background information so that IBM Software Support specialists can help you solve the problem efficiently. To save time, know the answers to these questions:

- What software versions were you running when the problem occurred?
- Do you have logs, traces, and messages that are related to the problem symptoms? IBM Software Support is likely to ask for this information.
- Can you re-create the problem? If so, what steps were performed to re-create the problem?
- Did you make any changes to the system? For example, did you make changes to the hardware, operating system, networking software, and so on.
- Are you currently using a workaround for the problem? If so, be prepared to explain the workaround when you report the problem.

Submitting problems

You can submit your problem to IBM Software Support in one of two ways:

Online
Click **Submit and track problems** on the IBM Software Support site at http://www.ibm.com/software/support/probsub.html. Type your information into the appropriate problem submission form.

By phone
For the phone number to call in your country, go to the contacts page of the *IBM Software Support Handbook* at http://techsupport.services.ibm.com/guides/contacts.html and click the name of your geographic region.

If the problem you submit is for a software defect or for missing or inaccurate documentation, IBM Software Support creates an Authorized Program Analysis Report (APAR). The APAR describes the problem in detail. Whenever possible, IBM Software Support provides a workaround that you can implement until the APAR is resolved and a fix is delivered. IBM publishes resolved APARs on the Software Support Web site daily, so that other users who experience the same problem can benefit from the same resolution.

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Glossary

A

administration mode. See workspace administration mode.

application support. The product-provided situations, templates, and other sample data to the Enterprise Information Base (EIB) tables of the Tivoli Enterprise Monitoring Server.

attribute. A system or application element being monitored by the OMEGAMON agent, such as Disk Name and Disk Read/Writes Per Second. An attribute can also be a field in an ODBC-compliant database.

attribute group. A set of related attributes that can be combined in a data view or a situation. When you open the view or start the situation, the Tivoli Enterprise Portal retrieves data samples of the selected attributes. Each type of agent has a set of attribute groups.

attribute table. See attribute group.

B

browser client. The software installed with the Tivoli Enterprise Portal Server system that is downloaded to your computer when you start Tivoli Enterprise Portal browser mode.

C

Candle® Management Workstation (CMW). The client component of a CandleNet Command Center environment. It has been mostly replaced by theTivoli Enterprise Portal user interface, but is required for some advanced functions.

CandleNet Command Center (CCC). A client-server implementation comprising a Tivoli Enterprise Monitoring Server, Tivoli Enterprise Portal Server, Tivoli Enterprise Portal client, and Tivoli Monitoring Agents that collect and distribute data to the Tivoli Enterprise Monitoring Server. The CandleNet Command Center has been renamed to Tivoli Monitoring Services.

Configuration Tool. A tool used to install some formerly Candle products and configure Tivoli Management Services zSeries products, that are now installed using the System Modification Program/Extended (SMP/E) tool instead.

Consolidated Software Inventory. The SMP/E data set that contains information about the structure of a user's system as well as information needed to install the operating system on a user's system. The SMPCSI DD statement refers specifically to the CSI that contains the global zone. This is also called the master CSI.

CSI. See "Consolidated Software Inventory."

D

desktop client. See Tivoli Enterprise Portal.

E

expert advice. A description within the Situation Editor of each situation provided with a monitoring agent to help you quickly gather and interpret data.

F

filter criteria. Limits the amount of information returned to the data view in response to a query. You can apply a pre-filter to the query to collect only certain data, or apply a post-filter to the view properties to show only certain data from what was collected.

H

historical data management. The procedures applied to short-term binary history files that perform roll off to either a data warehouse or to delimited text files and delete entries in the short-term history files over 24 hours old to make room for new entries.

hub Tivoli Enterprise Monitoring Server. The Tivoli Enterprise Monitoring Server that has been elected to act as the focal point to which all Tivoli Enterprise Portal Servers connect. See also "remote Tivoli Enterprise Monitoring Server" on page 194.

I

IBM Tivoli Monitoring. A client-server implementation comprising a Tivoli Enterprise Monitoring Server, an application server known as theTivoli Enterprise Portal Server, the Tivoli Enterprise Portal client, and Tivoli Enterprise Monitoring Agents that collect and distribute data to a monitoring server.

L

links. Tivoli Enterprise Portal workspaces can be linked to one another. A link from a workspace table

row or chart point may be to a workspace with more details about that data series.

M

managed system. A particular operating system, subsystem, or application in your enterprise where a Tivoli Enterprise Monitoring Agent is installed and running.

monitoring agent. Software installed on systems you want to monitor that collects data about an operating system, subsystem, or application.

monitor interval. A specified time, scalable to seconds, minutes, hours, or days, for how often the Tivoli Enterprise Monitoring Server checks to see if a situation has become true. The minimum monitor interval is 30 seconds; the default is 15 minutes.

N

Navigator. The left pane of the Tivoli Enterprise Portal window. The Navigator Physical view shows your network enterprise as a physical hierarchy of systems grouped by platform. OMEGAMON DE users can also create other views to create logical hierarchies grouped as you specify, such as Tivoli Enterprise Portal by department or function.

O

OMEGAMON Platform. A client-server implementation comprising a Tivoli Enterprise Monitoring Server, an application server known as the Tivoli Enterprise Portal Server, the Tivoli Enterprise Portal client, and monitoring agents that collect and distribute data to a Tivoli Enterprise Monitoring Server.

P

presentation files. Installed with the Tivoli Enterprise Portal Server, presentation.dat and presentation.idx store the workspace definitions, link definitions, and terminal emulator scripts.

product code. The three-letter code used by IBM Tivoli Monitoring to identify the product component. For example, the product code for the IBM Tivoli Decision Support for z/OS monitoring agent is KDO.

Q

queries. Every monitoring agent comes with a set of predefined queries for every attribute group. These queries tell the monitoring server what monitoring data to retrieve from the agent to display in a chart or table view. You can create your own queries to specify exactly which attributes to retrieve for the table or chart, thus saving valuable resources by retrieving only the data you want and nothing more. For example, you can build a filter into the query to retrieve only records whose file size is greater than 5 megabytes.

query permissions. If you do not see the Queries tool, your user ID does not have View or Modify Query permissions. If you can see the tool but it is disabled, your user ID does not have Workspace Author Mode permission. If you can open the Query editor but the tools are disabled, your user ID does not have Modify Query permission.

R

RAS1 Trace log. The reliability, availability, and serviceability (RAS1) trace log. This is the principle trace log which captures information about the operating environment to help you diagnose problems when components fail to operate as intended. You can set up RAS1 tracing for the monitoring agent, Tivoli Enterprise Monitoring Server, and Tivoli Enterprise Portal Server.

remote Tivoli Enterprise Monitoring Server. The Tivoli Enterprise Monitoring Server that passes its collected data to the hub Tivoli Enterprise Monitoring Server to be made available to clients, creating an enterprise-wide view. See also “hub Tivoli Enterprise Monitoring Server” on page 193.

runtime environments (RTE). A group of runtime libraries that provide an operational environment on a z/OS system.

S

seed data. The product-provided situations, templates, and other sample data to the Enterprise Information Base (EIB) tables of the Tivoli Enterprise Monitoring Server.

seeding. Before you can use a monitoring agent, the Tivoli Enterprise Monitoring Server to which it reports must be seeded, that is, initialized with application data. Seeding adds product-provided situations, templates, and other sample data to the Tivoli Enterprise Monitoring Server Enterprise Information Base (EIB) tables.

Shared Consolidated Software Inventory. See “Consolidated Software Inventory” on page 193.

situation. A set of conditions that, when met, creates an event. A condition consists of an attribute, an operator such as greater than or equal to, and a value. It can be read as, “If – system condition – compared to – value – is true”. An example of a situation is: IF – CPU usage – GT – 90% – TRUE. The expression “CPU usage GT 90%” is the situation condition.

SMP/E. System Modification Program / Extended.

An IBM licensed program used to install software and software changes on z/OS systems. In addition to providing the services of SMP, SMP/E consolidates installation data, allows more flexibility in selecting changes to be installed, provides a dialog interface, and supports dynamic allocation of data sets.

Structured Query Language. See "SQL."

SQL. SQL is a standardized language for defining and manipulating data in a relational database.

T

Take Action. A dialog on Tivoli Enterprise Portal from which you can enter your command or choose from a list of predefined commands. It also has a list of systems on which to effect the command.

target libraries. SMP/E-controlled libraries that contain the data from the distribution media.

threshold. A level set in the system at which a message is sent or an error-handling program is called. For example, in a user auxiliary storage pool, the user can set the threshold level in the system values, and the system notifies the system operator when that level is reached.

Tivoli Enterprise Monitoring Server. The host data management component for the Tivoli Management Services environment. The Tivoli Management Services component that retrieves data from the monitoring agents and delivers data to the Tivoli Enterprise Portal Server, sends alerts to the Tivoli Enterprise Portal Server when conditions specified in situations are met, receives commands from the Tivoli Enterprise Portal and passes them to the appropriate monitoring agents, and (optionally) provides a repository for short-term historical data. This component can be installed on z/OS, Windows, Linux, and some UNIX operating systems.

Tivoli Enterprise Portal. The Tivoli Management Services server you log on to. The Tivoli Enterprise Portal Server connects to the hub Tivoli Enterprise Monitoring Server. It enables retrieval, manipulation and analysis of data from Tivoli Management Services managed systems.

Tivoli Enterprise Portal Server. The server you log on to and connect to from the Tivoli Enterprise Portal client. The portal server connects to the hub monitoring server. It enables retrieval, manipulation and analysis of data from monitoring agents.

Tivoli Management Services. A client-server implementation comprising a Tivoli Enterprise Monitoring Server, an application server known as the Tivoli Enterprise Portal Server, the Tivoli Enterprise Portal client, and monitoring agents that collect and distribute data to a Tivoli Enterprise Monitoring Server.

Tivoli Monitoring. See "IBM Tivoli Monitoring" on page 193.

Tivoli Monitoring Services. An integrated, layered architecture consisting of data access, communication, and presentation components that enable cross-platform operation and integration of data for systems management applications.

V

view. A windowpane, or frame, in a workspace. It could contain data from an agent in a chart or table, or it can contain a terminal session or browser, for example. A view can be split into two separate, autonomous views.

W

workspace. The viewing area of the Tivoli Enterprise Portal window, excluding the Navigator. Each workspace comprises one or more views. Every Navigator item has its own default workspace and can have multiple workspaces.

workspace administration mode. A global parameter set in the Administer Users editor, but is available only for user IDs with administrator authority. While enabled for a user ID, customization of workspaces, links, and terminal session scripts automatically become available to all users connected to the same Tivoli Enterprise Portal Server.

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