IBM Tivoli Composite Application Manager for Microsoft Applications: Microsoft SQL Server Agent
6.3.1 Fix Pack 16

Troubleshooting Guide

Note

Before using this information and the product it supports, read the information in “Notices” on page 35.

This edition applies to version 6.1.3.16 of IBM Tivoli Composite Application Manager for Microsoft Applications: Microsoft SQL Server Agent (product number 5724-U17) and to all subsequent releases and modifications until otherwise indicated in new editions.

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Chapter 1. Troubleshooting basics

To troubleshoot a problem, gather information about the problem for IBM® Software Support, use logging data, and consult the lists of identified problems and workarounds.

For general troubleshooting information, see the *IBM Tivoli Monitoring Troubleshooting Guide*. For other problem-solving options, see Chapter 4, “Support information,” on page 29.

You can resolve some problems by ensuring that your system matches the system requirements. The most up-to-date requirements are in the Software product compatibility reports (http://publib.boulder.ibm.com/infocenter/prodguid/v1r0/clarity/index.html).

The following activities can help you find a solution to the problem you are having:

Gathering product information for IBM Software Support

Before contacting IBM Software Support about a problem you are experiencing with this product, gather the information shown in Table 1 on page 1.

Table 1. Information to gather before contacting IBM Software Support

Information type	Description
Log files	Collect trace log files from failing systems. Most logs are located in a logs subdirectory on the host computer. See “Principal trace log files” on page 4 for lists of all trace log files and their locations. For general information about the IBM Tivoli® Monitoring environment, see the *Tivoli Enterprise Portal User's Guide*.
Microsoft SQL Server information	Version number and patch level
Operating system	Operating system version number and patch level
Messages	Messages and other information displayed on the screen
Version numbers for IBM Tivoli Monitoring	Version number of the following members of the monitoring environment: • IBM Tivoli Monitoring. Also provide the patch level, if available. • Microsoft SQL Server
Screen captures	Screen captures of incorrect output, if any
(UNIX systems only) Core dump files	If the system stops on UNIX systems, collect the core dump file from the *install_dir*/bin directory, where *install_dir* is the directory where you installed the monitoring agent.

You can use the pdcollect tool to collect the most commonly used information from a system. This tool gathers log files, configuration information, version information, and other data. For more information about using this tool, see "pdcollect tool" in the *IBM Tivoli Monitoring Troubleshooting Guide*.

For information about working with IBM Software Support, see IBM Support Portal Service Requests and PMRs (http://www.ibm.com/support/entry/portal/Open_service_request/Software/Software_support_(general)).

Using logging

Logging is the primary troubleshooting feature in the monitoring agent. *Logging* refers to the text messages and trace data that is generated by the agent. Messages and trace data are sent to a file.

Trace data captures transient information about the current operating environment when a component or application fails to operate as designed. IBM Software Support personnel use the captured trace information to determine the source of an error or unexpected condition. See Chapter 2, “Trace logging,” on page 3 for more information.

Consulting the lists of identified problems and workarounds

Known problems are organized into types such as those in the following list to make them easier to locate:

- Installation, configuration, uninstallation
- Remote deployment
- Agent
- Workspace
- Situation
- Take Action commands
- Discovery Library Adapter
- Tivoli Common Reporting

See Chapter 3, “Problems and workarounds,” on page 11 for information about symptoms and detailed workarounds for these types of problems.

For general troubleshooting information, see the *IBM Tivoli Monitoring Troubleshooting Guide*.

Chapter 2. Trace logging

Trace logs are used to capture information about the operating environment when component software fails to operate as designed.

The principal log type is the RAS (Reliability, Availability, and Serviceability) trace log. These logs are in the English language only. The RAS trace log mechanism is available for all components of IBM Tivoli Monitoring. Most logs are in a logs subdirectory on the host computer. See the following information to learn how to configure and use trace logging:

Note: The documentation refers to the RAS facility in IBM Tivoli Monitoring as "RAS1."

IBM Software Support personnel use the information captured by trace logging to trace a problem to its source or to determine why an error occurred. All components in the IBM Tivoli Monitoring environment have a default tracing level. The tracing level can be changed on a per-component level to adjust the type of trace information collected, the degree of trace detail, the number of trace logs to be kept, and the amount of disk space used for tracing.

Overview of log file management

Knowing the naming conventions for log files helps you to find the files.

Agent log file naming conventions

Table 2 on page 5 provides the names, locations, and descriptions of IBM Tivoli Monitoring general RAS1 log files. The log file names for the Microsoft SQL Server adhere to the following naming convention:

Windows systems
hostname_productcode_program_HEXtimestamp-nn.log

Linux® and UNIX systems
hostname_productcode_program_HEXtimestamp-nn.log

Where:

hostname
Host name of the computer where the monitoring component is running.

productcode
Two-character product code. For IBM Tivoli Composite Application Manager for Microsoft Applications: Microsoft SQL Server Agent, the product code is oq.

program
Name of the program being run.

HEXtimestamp
Hexadecimal time stamp representing the time at which the program started.

nn
Rolling log suffix.

Examples of trace logging

If a Microsoft SQL Server database `dbinst02` is running on computer `server01`, the RAS log file for the Microsoft SQL Server agent might be named as follows:

```
server01_OQ_dbinst02_koqagent_437fc59-01.log
```

For long-running programs, the *nn* suffix is used to maintain a short history of log files for that startup of the program. For example, the koqagent program might have a series of log files as follows:

```
server01_oq_dbinst02_koqagent_437fc59-01.log
server01_oq_dbinst02_koqagent_437fc59-02.log
server01_oq_dbinst02_koqagent_437fc59-03.log
```

As the program runs, the first log (*nn*=01) is preserved because it contains program startup information. The remaining logs *roll*. In other words, when the set of numbered logs reach a maximum size, the remaining logs are overwritten in sequence. Each time a program is started, a new timestamp is assigned to maintain a short program history. For example, if the Microsoft SQL Server agent is started twice, it might have log files as follows:

```
server01_oq_dbinst02_koqagent_437fc59-01.log
server01_oq_dbinst02_koqagent_437fc59-02.log
server01_oq_dbinst02_koqagent_437fc59-03.log

server01_oq_dbinst02_koqagent_537fc59-01.log
server01_oq_dbinst02_koqagent_537fc59-02.log
server01_oq_dbinst02_koqagent_537fc59-03.log
```

Each program that is started has its own log file. For example, the Microsoft SQL Server agent would have agent logs in this format:

```
server01_oq_dbinst02_koqagent_437fc59-01.log
```

Other logs, such as logs for collector processes and Take Action commands, have a similar syntax, as in the following example:

```
server01_oq_dbinst02_koqsql_447fc59-01.log
```

where **koqsql** is the name of a program.

Note: When you communicate with IBM Software Support, you must capture and send the RAS1 log that matches any problem occurrence that you report.

Principal trace log files

Trace log files are located on various systems.

Table 2 on page 5 contains locations, file names, and descriptions of trace logs that can help determine the source of problems with agents.

Table 2. Trace log files for troubleshooting agents		
System where log is located	**File name and path**	**Description**
On the Tivoli Enterprise Monitoring Server	• **Windows:** The `IBM Tivoli Monitoring` *timestamp*`.log` file in the *install_dir*`\InstallITM` path • **UNIX:** The `candle_installation.log` file in the *install_dir*`/logs` path • **Linux:** The `candle_installation.log` file in the *install_dir*`/logs` path	Provides details about products that are installed. **Note:** Trace logging is enabled by default. A configuration step is not required to enable this tracing.
On the Tivoli Enterprise Monitoring Server	The `Warehouse_Configuration.log` file is in the following location on Windows systems: *install_dir*`\InstallITM`	Provides details about the configuration of data warehousing for historical reporting.
On the Tivoli Enterprise Monitoring Server	The name of the RAS log file is as follows: • **Windows:** *install_dir* `\logs \`*hostname*`_ms_`*timestamp-nn*`.log` • **UNIX:** *install_dir*`/logs/`*hostname*`_ms_`*timestamp-nn*`.log` • **Linux:** *install_dir*`/logs/`*hostname*`_ms_`*timestamp-nn*`.log` **Note:** File names for RAS1 logs include a hexadecimal time stamp. Also on UNIX systems, a log with a decimal time stamp is provided: *hostname*`_oq_`*timestamp*`.log` and *hostname*`_oq_`*timestamp*`.pid` *nnnnn* in the *install_dir*`/logs` path, where *nnnnn* is the process ID number.	Traces activity on the monitoring server.

Table 2. Trace log files for troubleshooting agents (continued)		
System where log is located	**File name and path**	**Description**
On the Tivoli Enterprise Portal Server	The name of the RAS log file is as follows: • **Windows:** *install_dir* \logs\ *hostname*_cq_HEXtimestamp-nn.log • **UNIX:** *install_dir*/logs/ *hostname*_cq_HEXtimestamp-nn.log • **Linux:** *install_dir* /logs/ *hostname*_cq_HEXtimestamp-nn.log **Note:** File names for RAS1 logs include a hexadecimal time stamp. Also on UNIX systems, a log with a decimal time stamp is provided: *hostname*_oq_*timestamp*.log and *hostname*_oq_*timestamp*.pid *nnnnn* in the *install_dir*/logs path, where *nnnnn* is the process ID number.	Traces activity on the portal server.
On the Tivoli Enterprise Portal Server	The teps_odbc.log file is located in the following path: • **Windows:** *install_dir* \InstallITM • **UNIX:** *install_dir*/logs • **Linux:** *install_dir*/logs	When you enable historical reporting, this log file traces the status of the warehouse proxy agent.
On the computer that hosts the monitoring agent	The RAS1 log files are as follows: These logs are in the following directories:	Traces activity of the monitoring agent.

Table 2. Trace log files for troubleshooting agents (continued)		
System where log is located	**File name and path**	**Description**
On the computer that hosts the monitoring agent	The agent operations log files are as follows: *instance_hostname_OQ*.LG0 is the current log created when the agent is started. *instance_hostname_OQ*.LG1 is the backup of the previous log. These logs are in the following directory depending on the operating system that you are using:	Shows whether the agent could connect to the monitoring server. Shows which situations are started and stopped, and shows other events while the agent is running. A new version of this file is generated every time the agent is restarted. IBM Tivoli Monitoring generates one backup copy of the *.LG0 file with the tag .LG1. View the .LG1 tag to learn the following details regarding the *previous* monitoring session: • Status of connectivity with the monitoring server • Situations that were running • The success or failure status of Take Action commands
Definitions of variables: • *timestamp* is a time stamp with a format that includes year (y), month (m), day (d), hour (h), and minute (m), as follows: **yyyymmdd hhmm** • *HEXtimestamp* is a hexadecimal representation of the time at which the process was started. • *install_dir* represents the directory path where you installed the IBM Tivoli Monitoring component. *install_dir* can represent a path on the computer that hosts the monitoring system, the monitoring agent, or the portal. • *instance* refers to the name of the database instance that you are monitoring. • *instance_name* refers to the name of the agent instance. • *hostname* refers to the name of the computer on which the IBM Tivoli Monitoringcomponent runs. • *nn* represents the circular sequence in which logs are rotated. this value includes a range from 1 - 5, by default. The first is always retained because it includes configuration parameters.		

For more information about the complete set of trace logs that are maintained on the monitoring server, see the *IBM Tivoli Monitoring Installation and Setup Guide*.

Viewing trace logs

You can view trace logs to learn some basic facts about your IBM Tivoli Monitoring environment.

About this task

Typically IBM Software Support applies specialized knowledge to analyze trace logs to determine the source of problems. However, you can view a trace log in a text editor that is enabled for UTF-8, such as Notepad.

On Windows, you can use the following alternate method to view trace logs:

Procedure

1. In the Windows **Start** menu, choose **Program Files > IBM Tivoli Monitoring > Manage Tivoli Monitoring Service**. The Manage Tivoli Enterprise Monitoring Services window is displayed.

2. Right-click a component and select **Advanced > View Trace Log** in the pop-up menu. The program displays the Select Log File window that lists the RAS1 logs for the monitoring agent.
3. Select a log file from the list and click **OK**. You can also use this viewer to access remote logs.

   Note: The viewer converts time stamps in the logs to a readable format.

RAS trace parameters

Pinpoint a problem by setting detailed tracing of individual components of the monitoring agent and modules

See "Overview of log file management" on page 3 to ensure that you understand log rolling and can reference the correct log files when you manage log file generation.

Setting RAS trace parameters by using the GUI

On Windows systems, you can use the graphical user interface to set trace options.

About this task

The IBM Tivoli Composite Application Manager for Microsoft Applications: Microsoft SQL Server Agent uses RAS1 tracing and generates the logs described in Table 2 on page 5. The default RAS1 trace level is ERROR.

Procedure

1. Open the **Manage Tivoli Enterprise Monitoring Services** window.
2. Select **Advanced** > **Edit Trace Parms**. The **Tivoli Enterprise Monitoring Server Trace Parameters** window is displayed.
3. Select a new trace setting in the pull-down menu in the **Enter RAS1 Filters** field or type a valid string.
   - General error tracing. KBB_RAS1=ERROR
   - Intensive error tracing. KBB_RAS1=ERROR (UNIT:koq ALL)
   - Maximum error tracing. KBB_RAS1=ERROR (UNIT:koq ALL) (UNIT:kra ALL)

   Note: As this example shows, you can set multiple RAS tracing options in a single statement.
4. Modify the value for Maximum Log Size Per File (MB) to change the log file size (changes LIMIT value).
5. Modify the value for Maximum Number of Log Files Per Session to change the number of log files per startup of a program (changes COUNT value).
6. Modify the value for Maximum Number of Log Files Total to change the number of log files for all startups of a program (changes MAXFILES value).
7. Optional: Click Y (Yes) in the **KDC_DEBUG Setting** menu to log information that can help you diagnose communications and connectivity problems between the monitoring agent and the monitoring server. The **KDC_DEBUG** setting and the **`Maximum error tracing`** setting can generate a large amount of trace logging. Use these settings only temporarily, while you are troubleshooting problems. Otherwise, the logs can occupy excessive amounts of hard disk space.
8. Click **OK**. You see a message reporting a restart of the monitoring agent so that your changes take effect.

What to do next

Monitor the size of the `logs` directory. Default behavior can generate a total of 45 - 60 MB for each agent that is running on a computer. For example, each database instance that you monitor can generate 45 - 60 MB of log data. See the "Procedure" section to learn how to adjust file size and numbers of log files to prevent logging activity from occupying too much disk space.

Regularly prune log files other than the RAS1 log files in the `logs` directory. Unlike the RAS1 log files that are pruned automatically, other log types can grow indefinitely, for example, the logs in Table 2 on page 5 that include a process ID number (PID).

Use collector trace logs as an additional source of troubleshooting information.

Note: The **KDC_DEBUG** setting and the **Maximum error tracing** setting can generate a large amount of trace logging. Use these settings only temporarily while you are troubleshooting problems. Otherwise, the logs can occupy excessive amounts of hard disk space.

Chapter 3. Problems and workarounds

The known problems and workarounds are organized into types of problems that might occur with an agent, for example installation and configuration problems and workspace problems.

You can resolve some problems by ensuring that your system matches system requirements. The most up-to-date requirements are in the Software product compatibility reports (http://publib.boulder.ibm.com/infocenter/prodguid/v1r0/clarity/index.html).

For general troubleshooting information, see the *IBM Tivoli Monitoring Troubleshooting Guide*.

Installation and configuration troubleshooting

Problems can occur during installation, configuration, and uninstallation of the agent.

See Table 3 on page 11 and Table 4 on page 12 for information about these problems and solutions.

Table 3. Problems and solutions for installation and configuration

Problem	Solution
A message similar to "`Unable to find running CMS on CT_CMSLIST`" in the log file is displayed.	If a message similar to "`Unable to find running CMS on CT_CMSLIST`" is displayed in the log file, the agent cannot connect to the monitoring server. Confirm the following points: • Do multiple network interface cards (NICs) exist on the system? • If multiple NICs exist on the system, find out which one is configured for the monitoring server. Ensure that you specify the correct host name and port settings for communication in the IBM Tivoli Monitoring environment.
The system is experiencing high CPU usage.	**Agent process:** View the memory usage of the KOQCMA process. If CPU usage seems to be excessive, restart the monitoring agent. **Network cards:** The network card configurations can decrease the performance of a system. Each stream of packets that a network card receives (assuming that it is a broadcast or destined for the under-performing system) must generate a CPU interrupt and transfer the data through the I/O bus. If the network card in question is a bus-mastering card, work can be offloaded and a data transfer between memory and the network card can continue without using CPU processing power. Bus-mastering cards are 32-bit and are based on PCI or EISA bus architectures.
When you install a 32-bit agent for ITCAM for Microsoft Applications, the following message is displayed under the **Install the following features** list, : `Undefined GSK component:IBM GSKit Security Interface`	Ignore this message and proceed with the installation.

Table 3. Problems and solutions for installation and configuration (continued)	
Problem	**Solution**
The configuration panel is blank on 64-bit Windows systems where the Tivoli Enterprise Monitoring Agent Framework (component GL) is version 06.23.00.00 or 06.23.01.00.	Check the GL component version by running kincinfo -t GL from a Windows command line. Example: `%CANDLE_HOME%\InstallITM\kincinfo -t GL` If the GL component version is 06.23.00.00 or 06.23.01.00, take one of the following actions: • **Preferred action:** Upgrade the Windows OS Agent to Version 6.2.3 Fix Pack 2. • **Alternate action:** Install the Agent Compatibility (AC) component from the IBM Tivoli Monitoring V6.2.3 Fix Pack 1 media. See Installing the Agent Compatibility (AC) component (http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.itm.doc_6.2.3fp1/itm623FP1_install199.htm#acpinstall).

Table 4. General problems and solutions for uninstallation	
Problem	**Solution**
The way to remove inactive managed systems (systems whose status is OFFLINE) from the Navigator tree in the portal is not obvious.	Use the following steps to remove, but not uninstall, an offline managed system from the Navigator tree: 1. Click the **Enterprise** icon in the Navigator tree. 2. Right-click, and then click **Workspace** > **Managed System Status**. 3. Right-click the offline managed system, and select **Clear offline entry**. To uninstall the monitoring agent, use the procedure described in the *IBM Tivoli Monitoring Installation and Setup Guide*.
The entry for IBM Tivoli Monitoring is removed from the **Add or Remove Programs** window if you install a component of ITCAM for Microsoft Applications, 32-bit agent in the following situations: • You have installed the 64-bit Windows OS on your computer. • You have installed the 32/64-bit Agent Compatibility Package (ACP) of ITCAM for Microsoft Applications, 64-bit agent.	Run the `setup.exe` file of the Windows OS agent V6.2.2, Fix Pack 2 to install the ACP. **Note:** You can also install the ACP by running the `setup.exe` file of ITCAM for Microsoft Applications, 64-bit agent.

Table 4. General problems and solutions for uninstallation (continued)	
Problem	**Solution**
After configuration of MS SQL Monitoring Agent in cluster environment using cluster utility, the collector service stops with logs suggesting the connection issue.	If you have used cluster utility to configure cluster resources, follow these steps to resolve the issue: 1. Make agent and collector resource offline in the failover cluster manager 2. Go to the MTEMS window. 3. Right click on problematic MS SQL Agent instance. 4. Go to **Advanced**->**Edit Variables**. 5. Edit the value of COLL_CLUSTERSERVER to be same as the network name of monitoring SQL Server instance. 6. Start agent and collector resources in the failover cluster manager **Note:** This issue is fixed in agent version 631FP15, so if user uses cluster utility in agent 631FP15 or higher this issue will not occur.
After uninstalling the MS SQL Monitoring Agent, the following agent registry path is not deleted `HKEY_LOCAL_MACHINE\SOFTWARE\Candle\KOQ.save\610`. Also, when the agent instance is removed using tacmd removeSystem or through TEP, then all the variables in following registry path are deleted as expected but, the agent instance specific registry folder is not deleted: `HKEY_LOCAL_MACHINE\SOFTWARE\Candle\KOQ\610\%INSTANCE%`	Delete the KOQ component using *regedit*.
When agent is upgraded using silent response file, the agent services account might get changed to Local System. If the agent service account is all except the LocalSystem, and the agent is upgraded to the latest version using silent response file, then the agent service account might get reset to LocalSystem. The service account changes if the silent response file has variable(s) inside CMA_CONFIG section. The silent response file is present in `$INSTALLER\WINDOWS\silent_agent.txt`. This problem is not applicable if you are performing upgrade through setup.exe UI	You can keep variable(s) under CMA_CONFIG section commented. Do not edit any variable(s) in CMA_CONFIG section. If you want to change variables present in CMA_CONFIG section for the agent, then it can be done after the upgrade.

Remote deployment troubleshooting

Problems can occur with remote deployment and removal of agent software using the Agent Remote Deploy process.

Table 5 on page 14 contains problems and solutions related to remote deployment.

Table 5. Remote deployment problems and solutions	
Problem	**Solution**
While you are using the remote deployment feature to install the IBM Tivoli Composite Application Manager for Microsoft Applications: Microsoft SQL Server Agent, an empty command window is displayed on the target computer. This problem occurs when the target of remote deployment is a Windows computer. (For more information about the remote deployment feature, see the *IBM Tivoli Monitoring Installation and Setup Guide*.)	Do not close or modify this window. It is part of the installation process and is dismissed automatically.
The removal of a monitoring agent fails when you use the remote removal process in the Tivoli Enterprise Portal desktop or browser.	This problem might occur when you attempt the remote removal process immediately after you restart the Tivoli Enterprise Monitoring Server. You must allow time for the monitoring agent to refresh its connection with the Tivoli Enterprise Monitoring Server before you begin the remote removal process.
User is not able to set or change Agent service logon account using TEP remote configuration or tacmd commandline utility. When TEP or tacmd commandline utility is used to create or edit an agent instance, the user might get the following error: *KDY1008E: The agent action SETCONFIG failed with a return code of 10 for product code oq. The command C:\IBM\ITM\ \TMAITM6_x64\kdy_xa.exe -p INST1:ITMHV7:MSS -pc oq produced the following error text: Error line(1776): unable to set user to run service as. The specified return code was received from the two way translator*	Make sure that you are using the ITM version higher than the fixed version mentioned in the following link: https://www.ibm.com/support/pages/apar/IV92927 1. Provide the service login id on TEP or in tacmd command line as follows: DomainName \AccountName . If the account is a local account on agent machine, provide the hostname of TEMA as domain. Example, if the hostname is ITMHV7 and account name is Administrator, enter account as ITMHV7\Administrator. 2. If you are providing the account in tacmd command line utility, provide the parameters in double quotes, for example: *tacmd configureSystem -m MSSQLSERVER:ITMHV7:MSS -p DBSETTINGS.db_winauth=1 _WIN32_STARTUP_.Username="ITMHV7\Administrator" _WIN32_STARTUP_.Password="P@ssw0rd" INSTANCE=MSSQLSERVER*

Agent troubleshooting

A problem can occur with the agent after it has been installed.

Table 6 on page 14 contains problems and solutions that can occur with the agent after it is installed.

Table 6. Agent problems and solutions	
Problem	**Solution**
Log data accumulates too rapidly.	Check the RAS trace option settings. The trace option settings that you can set on the KBB_RAS1= and KDC_DEBUG= lines potentially generate large amounts of data.

Table 6. Agent problems and solutions (continued)

Problem	Solution
A configured and running instance of the monitoring agent is not displayed in the Tivoli Enterprise Monitoring, but other instances of the monitoring agent on the same system are displayed in the portal.	IBM Tivoli Monitoring products use Remote Procedure Call (RPC) to define and control product behavior. RPC is the mechanism that a client process uses to make a subroutine call (such as GetTimeOfDay or ShutdownServer) to a server process somewhere in the network. Tivoli processes can be configured to use TCP/UDP, TCP/IP, SNA, and SSL as the protocol (or delivery mechanism) for RPCs that you want. IP.PIPE is the name given to Tivoli TCP/IP protocol for RPCs. The RPCs are socket-based operations that use TCP/IP ports to form socket addresses. IP.PIPE implements virtual sockets and multiplexes all virtual socket traffic across a single physical TCP/IP port (visible from the **netstat** command). A Tivoli process derives the physical port for IP.PIPE communications based on the configured, well-known port for the hub Tivoli Enterprise Monitoring Service. (This well-known port or BASE_PORT is configured by using the 'PORT:' keyword on the **KDC_FAMILIES / KDE_TRANSPORT** environment variable and defaults to '1918'.) The physical port allocation method is defined as (BASE_PORT + 4096*N), where N=0 for a Tivoli Enterprise Monitoring Service process and N={1, 2, ..., 15} for another type of monitoring server process. Two architectural limits result as a consequence of the physical port allocation method: • No more than one Tivoli Enterprise Monitoring Service reporting to a specific Tivoli Enterprise Monitoring Service hub can be active on a system image. • No more than 15 IP.PIPE processes can be active on a single system image. A single system image can support any number of Tivoli Enterprise Monitoring Service processes (address spaces) if each Tivoli Enterprise Monitoring Service on that image reports to a different hub. By definition, one Tivoli Enterprise Monitoring Service hub is available per monitoring enterprise, so this architecture limit has been reduced to one Tivoli Enterprise Monitoring Service per system image. No more than 15 IP.PIPE processes or address spaces can be active on a single system image. With the first limit expressed earlier, this second limitation refers specifically to Tivoli Enterprise Monitoring Agent processes: no more than 15 agents per system image. Continued on next row.

Table 6. Agent problems and solutions (continued)	
Problem	**Solution**
Continued from previous row.	This limitation can be circumvented (at current maintenance levels, IBM Tivoli monitoring V6.1, Fix Pack 4 and later) if the Tivoli Enterprise Monitoring Agent process is configured to use the EPHEMERAL IP.PIPE process. (This process is IP.PIPE configured with the 'EPHEMERAL:Y' keyword in the **KDC_FAMILIES / KDE_TRANSPORT** environment variable). The number of ephemeral IP.PIPE connections per system image has no limitation. If ephemeral endpoints are used, the Warehouse Proxy agent is accessible from the Tivoli Enterprise Monitoring Server associated with the agents using ephemeral connections either by running the Warehouse Proxy agent on the same computer or by using the Firewall Gateway feature. (The Firewall Gateway feature relays the Warehouse Proxy agent connection from the Tivoli Enterprise Monitoring Server computer to the Warehouse Proxy agent computer if the Warehouse Proxy agent cannot coexist on the same computer.)
When a default instance is configured for your agent, and you upgrade the agent from V6.3.1, Fix Pack 8 or earlier to V6.3.1, Fix Pack 10 or higher, the following error message might be displayed in a pop-up window: *Creating instance at Path C:\IBM\ITM \TMAITM6_x64\ koqcma.ini Product Code KOQ Instance $HOSTNAME$ failed* . The error occurs only when you upgrade the agent locally. The error does not occur in the following scenarios: • The agent is remotely upgraded. • The default instance and named instance (with the name as HOSTNAME) exist before you upgrade the agent.	Click **OK** and continue the upgrade process. This error does not impact the upgrade or configuration processes
Services are ‘Disabled’ after removal of multiple configured instances. When you have multiple instances configured and you un-configure more than instances from ‘Manage Tivoli Enterprise Monitoring Services’ (MTEMS) window, the agent services are not removed from the service manager and remain disabled. This may prevent you from configuring the same instance again. If you configure the same instance again and try to start the same instance, the following error is displayed: “The service cannot be started, either because it is disabled or because it has no enabled devices associated with it.”	If you un-configure multiple instances, close the MTEMS window and ensure that services corresponding to un-configured instances are removed from the Service Manager (services.msc). After confirming, you can re-open the MTEMS window and configure the removed instance again. Also, if the services for the newly configured instances are in disabled state, then close the MTEMS window. The services which are in disabled state will be deleted. Open the MTEMS window and double click the instance row to create a new agent service, and you start the agent.

Table 6. Agent problems and solutions (continued)	
Problem	**Solution**
The Override Local Settings will not be preserved after user changes configurations using silent configuration or local UI. The variables which are added (Right click the instance-> Advanced-> Edit Variables...) on the MTEMS window are saved in the Override Local Settings of instance specific INI file. The instance specific INI file is saved in %Candle Home% \TMAITM6_x64\KOQCMA_%INSTANCE%.ini for 64-bit and in %Candle Home% \TMAITM6\KOQCMA_%INSTANCE%.ini for 32-bit agent. When the MS SQL Agent instance is edited using the MTEMS window (Right click the template and navigate to Template-> Configure Using Defaults) or using silent configuration, then the variables saved in Override Local Settings section are not reflected in registry HKLM\Software\Candle\KOQ \610\%INSTANCE%\Environment	Open the MTEMS window and (right click Instance and navigate to Advanced-> Edit Variables...). All the environment variables which were previously added are listed. Click **OK**. All the environment variable added through Override Local Settings will be reflected in registry path (HKLM\Software\Candle\KOQ\610\ %INSTANCE%\Environment).

Table 6. Agent problems and solutions (continued)

Problem	Solution

RAS1 Logs not getting generated at proper location for MSSQL ITM Agent.
 	
For MS SQL Agent, logs are generated in the C:\ drive directory and not in the **ITM_HOME \TMAITM6\logs** directory. Also, the log name is incorrect.
 	
For example, expected log name: `<hostname>__oq_<instance>_koqagent_<hex>-01.log`
 	
Generated (incorrect) log name: `_oq__koqagent_<hex>-01.log`
	To correct the directory where agent log is created, do the following:
	
	1. Edit TMAITM6\KOQENV for 32-bit agent and TMAITM6_x64\KOQENV for 64-bit agent.
	2. Assuming that ITM_HOME is in C:\IBM\ITM, add following setting prior to KBB_RAS1 setting:
	   • For 32-bit agents, CTIRA_LOG_PATH= C:\IBM \ITM\TMAITM6\logs
	   • For 64-bit agents, CTIRA_LOG_PATH= C:\IBM \ITM\TMAITM6_x64\logs
	
	To correct the log name, add following setting for the hostname: `COLL_HOSTNAME= <hostname>`
	
	Additionally, if you are running single instance of the agent, you may include the following setting to incorporate instance name in the agent's log name: `COLL_SERVERID= <INSTANCE_NAME>`
	
	If you are running multiple instances, then you should not specify `COLL_SERVERID` to `KOQENV`. Log names for various instances will not be distinguishable. To locate which instance the log belongs to, open and analyze the log for `KBB_RAS1_LOG` variable. This variable will have the instance name in its value.
	
	If you have added following settings before KBB_RAS1:
	
	• CTIRA_LOG_PATH= C:\IBM\ITM \TMAITM6_x64\logs
	• COLL_SERVERID= INST1
	• COLL_HOSTNAME= MYHOST
	• KBB_RAS1=ERROR
	
	The log file will be created in following directory: **C:\IBM\ITM\TMAITM6_x64\logs** as `MYHOST_oq_INST1_koqagent_<hex>-01.log`

MS SQL Agent can monitor the huge size databases up to 20TB. When the SQL Server database has size greater than 20TB, the attributes related to database size show negative values.	There is no workaround for this problem. It is a limitation.

Table 6. Agent problems and solutions (continued)	
Problem	**Solution**
When the user disables *Table Detail Continuous Collection*, and has not scheduled the Table Detail Collection on *Daily/Weekly/Monthly frequency* then, after upgrading the agent *Table Detail Continuous Collection* will be enabled. There is no impact in data collection for Table Detail data collection. The frequency of Table Detail collection will be changed from demand based to *Interval Between Two Continuous Collection* (interval value set for table detail continuous collection thread).	After the agent upgrade, you can change Table Detail Continuous Collection for the agent.

Cluster Environment Troubleshooting

A problem can occur with the agent after it has been installed.

When you upgrade the MS SQL agent in a cluster environment, problems can be encountered.

Table 7. Cluster environment upgrade problems and solutions	
Problem	**Solution**
After upgrade from older version to latest version the cluster resources for agent and collector results in a failover to another node.	To avoid failover of resources on a different node, make cluster resources for agent and collector (Monitoring Agent for Microsoft SQL Server - %Instance name% and Monitoring Agent for Microsoft SQL Server - Collector %instance name %) manually offline before starting the upgrade process & make the same resources online after completing the upgrade.
After upgrading the agent in the cluster environment, agent services KOQCOLL_ %INSTANCE_NAME% and KOQAGENT_ %INSTANCE_NAME% are started on every cluster node where upgrade is completed. As a result, data for node where the role is active might not be displayed on ITM UI. Also, the cluster resources for agent and collector services are made offline after agent upgrade. Hence, the cluster resource state and service state are out of sync i.e. cluster resource are offline and services on system are running	After agent upgrade is complete, stop KOQAGENT_ %INSTANCE_NAME% and KOQCOLL_ %INSTANCE_NAME% services on all nodes of cluster environment. Change the state of the Monitoring Agent for Microsoft SQL Server %Instance name% and Monitoring Agent for Microsoft SQL Server - Collector %instance name% resources to *online* from the **Failover Cluster Manager,** to start monitoring MS SQL Server in cluster.

Table 7. Cluster environment upgrade problems and solutions (continued)	
Problem	**Solution**
After upgrading MS SQL monitoring agent in cluster environment, the collector service stops with logs suggesting the connection issue.	If you have used the cluster utility to configure cluster resources before upgrade, follow these steps to resolve the issue: 1. Make agent and collector resource offline in failover cluster manager. 2. Go to the MTEMS window. 3. Right click on the MS SQL Agent instance that has a problem. 4. Go to **Advanced**>**Edit variables**. 5. Edit the value of COLL_CLUSTERSERVER to be the same as network name of monitoring SQL Server instance. 6. Start the agent and collector resources in failover cluster manager . **Note:** This issue is fixed in agent version 6.3.1 Fix Pack 15, so if you use cluster utility in 6.3.1 Fix Pack 15 or higher and upgrade to newer versions, this issue will not occur.

Workspace troubleshooting

Problems can occur with general workspaces and agent-specific workspaces.

Table 8 on page 21 contains problems and solutions related to workspaces.

Table 8. Workspace problems and solutions

Problem	Solution
The process application components are available, but the Availability status shows PROCESS_DATA_NOT_ AVAILABLE.	This problem occurs because the PerfProc performance object is disabled. When this condition exists, IBM Tivoli Monitoring cannot collect performance data for this process. Use the following steps to confirm that this problem exists and to resolve it: 1. In the Windows **Start** menu, click **Run**. 2. Type `perfmon.exe` in the **Open** field of the **Run** window. The **Performance** window is displayed. 3. Click the plus sign (+) in the toolbar. The **Add Counters** window is displayed. 4. Look for **Process** in the **Performance object** menu. 5. Complete one of the following actions: • If you see **Process** in the menu, the PerfProc performance object is enabled and the problem is coming from a different source. You might need to contact IBM Software Support. • If you do not see **Process** in the menu, use the Microsoft utility from the Microsoft.com Operations website to enable the PerfProc performance object. The **Process** performance object becomes visible in the **Performance object** menu of the **Add Counters** windows, and IBM Tivoli Monitoring is able to detect Availability data. 6. Restart the monitoring agent.
The name of the attribute does not display in a bar chart or graph view.	When a chart or graph view that includes the attribute is scaled to a small size, a blank space is displayed instead of a truncated name. To see the name of the attribute, expand the view of the chart until sufficient space is available to display all characters of the attribute name.

Table 8. Workspace problems and solutions (continued)	
Problem	**Solution**
You start collection of historical data but the data cannot be seen.	Use the following managing options for historical data collection: • Basic historical data collection populates the Warehouse with raw data. This type of data collection is turned off by default. For information about managing this feature including how to set the interval at which data is collected, see "Managing historical data" in the *IBM Tivoli Monitoring Administrator's Guide*. By setting a more frequent interval for data collection, you reduce the load on the system incurred every time data is uploaded. • Use the Summarization and Pruning agent to collect specific amounts and types of historical data. Historical data is not displayed until the Summarization and Pruning monitoring agent begins collecting the data. By default, this agent begins collection at 2 a.m. daily. At that point, data is visible in the workspace view. For information about how to modify the default collection settings, see "Managing historical data" in the *IBM Tivoli Monitoring Administrator's Guide*.
Historical data collection is unavailable because of incorrect queries in the Tivoli Enterprise Portal.	The Sort By, Group By, and First/Last functions column are not compatible with the historical data collection feature. Use of these advanced functions makes a query ineligible for historical data collection. Even if data collection has started, you cannot use the time span feature if the query for the chart or table includes column functions or advanced query options (Sort By, Group By, First / Last). To ensure support of historical data collection, do not use the Sort By, Group By, or First/Last functions in your queries. For information about the historical data collection function, See "Managing historical data" in the *IBM Tivoli Monitoring Administrator's Guide* or the Tivoli Enterprise Portal online help .
When you use a long process name in the situation, the process name is truncated.	Truncation of process or service names for situations in the Availability table in the portal display is the expected behavior. The maximum name length is 100 bytes.
Regular (non-historical) monitoring data fails to be displayed.	Check the formation of the queries you use to gather data. For example, look for invalid SQL statements.

Table 8. Workspace problems and solutions (continued)	
Problem	**Solution**
Navigator items and workspace titles are labeled with internal names such as `Kxx:KXX0000` instead of the correct names (such as Disk), where XX and xx represent the two-character agent code.	Ensure that application support has been added on the monitoring server, portal server, and portal client. For more information about installing application support, see "Installing and enabling application support" in the *IBM Tivoli Monitoring Installation and Setup Guide*.
You have installed the Tivoli Enterprise Monitoring Server on z/OS®. In the Configuration panel of the History Collection Configuration window, if you have selected **TEMS** from the **Collection Location** list, the Tivoli Enterprise Portal does not display historical data for the following attribute groups: • ASP NET Applications • Availability • Event Log • Performance Object Status • Search	Reconfigure the history collection, and set the collection location as TEMA for these attribute groups.

Situation troubleshooting

Problems can occur with situations and situation configuration.

Table 9 on page 23 contains problems and solutions for situations.

Table 9. Situation problems and solutions	
Problem	**Solution**
Monitoring activity requires too much disk space.	Check the RAS trace logging settings that are described in “Setting RAS trace parameters by using the GUI” on page 8. For example, trace logs grow rapidly when you apply the ALL logging option.
Monitoring activity requires too many system resources.	See the information about disk capacity planning for historical data in the Reference guide for the agent for a description of the performance impact of specific attribute groups. If possible, decrease your use of the attribute groups that require greater system resources.
A formula that uses mathematical operators appears to be incorrect. For example, if you were monitoring a Linux system, the formula that calculates when **Free Memory** falls under 10 percent of **Total Memory** does not work: `LT #'Linux_VM_Stats.Total_Memory' / 10`	This formula is incorrect because situation predicates support only logical operators. Your formulas cannot have mathematical operators. **Note:** The Situation Editor provides alternatives to math operators. In the example, you can select the **% Memory Free** attribute and avoid the need for math operators.

Table 9. Situation problems and solutions (continued)	
Problem	**Solution**
You want to change the appearance of situations when they are displayed in the navigation tree.	1. Right-click an item in the navigation tree. 2. Click **Situations** in the menu. The **Situation Editor** window is displayed. 3. Select the situation that you want to modify. 4. Use the **State** menu to set the status and appearance of the Situation when it triggers. **Note:** The **State** setting is not related to severity settings in the Tivoli Enterprise Console®.
When a situation is triggered in the Event Log attribute group, it remains in the Situation Event Console as long as the event ID entry is present in the Event Log workspace. When this event ID entry is removed from the Event Log workspace on the Tivoli Enterprise Portal, the situation is also cleared even if the actual problem that caused the event is not resolved, and the event ID entry is also present in the Windows Event Viewer.	A timeout occurs on the cache of events for the NT Event Log group. Increase the cache time of Event Log collection to meet your requirements by adding the following variable and timeout value to the K*pc*ENV file for the agent (where *pc* is the two-letter product code): `CDP_NT_EVENT_LOG_CACHE_TIMEOUT=3600` This variable determines how long events from the NT Event Log are kept.
The situation for a specific agent is not visible in the Tivoli Enterprise Portal.	Open the Situation Editor. Access the All managed servers view. If the situation is not displayed, confirm that the monitoring server has been seeded for the agent. If not, seed the server, as described in the *IBM Tivoli Monitoring Installation and Setup Guide*.
The monitoring interval is too long.	Access the Situation Editor view for the situation that you want to modify. Check the **Sampling interval** area in the **Formula** tab. Adjust the time interval as required.
The situation did not activate at startup.	Manually recycle the situation as follows: 1. Right-click the situation and select **Stop Situation**. 2. Right-click the situation and select **Start Situation**. **Note:** You can permanently avoid this problem by selecting the **Run at Startup** check box of the Situation Editor view for a specific situation.
The situation is not displayed.	Click the **Action** tab and check whether the situation has an automated corrective action. This action can occur directly or through a policy. The situation might be resolving so quickly that you do not see the event or the update in the graphical user interface.
An Alert event did not occur even though the predicate was correctly specified.	Check the logs, reports, and workspaces.

Table 9. Situation problems and solutions (continued)

Problem	Solution
A situation fires on an unexpected managed object.	Confirm that you distributed and started the situation on the correct managed system.
The product did not distribute the situation to a managed system.	Click the **Distribution** tab and check the distribution settings for the situation.
The situation does not fire.	This problem can be caused when incorrect predicates are present in the formula that defines the situation. For example, the managed object shows a state that normally triggers a monitoring event, but the situation is not true because the wrong attribute is specified in the formula. In the **Formula** tab, analyze predicates as follows: 1. Click the **fx** icon in the **Formula** area. The **Show formula** window is displayed. a. Confirm the following details in the **Formula** area of the window: • The attributes that you intend to monitor are specified in the formula. • The situations that you intend to monitor are specified in the formula. • The logical operators in the formula match your monitoring goal. • The numeric values in the formula match your monitoring goal. b. (Optional) Select the **Show detailed formula** check box to see the original names of attributes in the application or operating system that you are monitoring. c. Click **OK** to dismiss the **Show formula** window. 2. (Optional) In the **Formula** area of the **Formula** tab, temporarily assign numeric values that immediately trigger a monitoring event. The triggering of the event confirms that other predicates in the formula are valid. **Note:** After you complete this test, you must restore the numeric values to valid levels so that you do not generate excessive monitoring data based on your temporary settings. For additional information about situations that do not fire, see "Situations are not firing" in the *IBM Tivoli Monitoring Troubleshooting Guide*.
Situation events are not displayed in the Events Console view of the workspace.	Associate the situation with a Navigator item. **Note:** The situation does not need to be displayed in the workspace. It is sufficient that the situation is associated with any Navigator item.

Table 9. Situation problems and solutions (continued)	
Problem	**Solution**
You do not have access to a situation.	**Note:** You must have administrator privileges to complete these steps. 1. Click **Edit** > **Administer Users** to access the **Administer Users** window. 2. In the **Users** area, select the user whose privileges you want to modify. 3. In the **Permissions** tab, **Applications** tab, and **Navigator Views** tab, select the permissions or privileges that correspond to the user role. 4. Click **OK**.
A managed system seems to be offline.	1. Select **Physical View** and click the Enterprise Level of the navigator tree. 2. Click **View** > **Workspace** > **Managed System Status** to see a list of managed systems and their status. 3. If a system is offline, check network connectivity and the status of the specific system or application.

Take Action commands troubleshooting

Problems can occur with Take Action commands.

Table 10 on page 26 contains problems and solutions that can occur with Take Action commands.

When each Take Action command runs, it generates a log file listed in Table 2 on page 5.

Table 10. Take Action commands problems and solutions	
Problem	**Solution**
Take Action commands often require several minutes to complete.	Allow several minutes. If you do not see a message advising you of completion, try to run the command manually.
Situations fail to trigger Take Action commands.	Attempt to manually run the Take Action command in the Tivoli Enterprise Portal. If the Take Action command works, look for configuration problems in the situation. See "Situation troubleshooting" on page 23. If the Take Action command fails, for general information about troubleshooting Take Action commands, see the *IBM Tivoli Monitoring Troubleshooting Guide*.

Tivoli Common Reporting troubleshooting

You can troubleshoot problems that occur with the Tivoli Common Reporting predefined reports for the Microsoft SQL Server.

The table contains problems and solutions that can occur with the Tivoli Common Reporting predefined reports for the agent. For information about troubleshooting for the Tivoli Common Reporting tool, see Troubleshooting Tivoli Common Reporting (http://pic.dhe.ibm.com/infocenter/tivihelp/v3r1/topic/com.ibm.psc.doc_1.1.0.1/tshoot/tcr_c_tshoot.html).

Table 11. Tivoli Common Reporting for Microsoft SQL Server problems and solutions

Problem	Solution
When you simultaneously query two tables in the Query Studio interface, no data is displayed. However, when you query the two tables separately, data is displayed.	This problem occurs when a relationship between the tables is not defined. To resolve this problem, ensure that all the ad hoc queries have at least one identifier.
When you create an ad hoc query by dragging some columns in the Query Studio interface, the following error message is displayed: `RQP-DEF-0177 An error occurred while performing operation 'sqlPrepareWithOptions' status='-232'.`	This is an SQL error related to arithmetic flow. This error is generated because the average or the sum for certain columns is more than the threshold size that is defined in the database. To resolve this error, use the limited columns and add a standard timestamp while creating an ad hoc query.
If a view or a table for the selected summarization type does not exist in the database for a report, the report does not open and the following error message is displayed: `RQP-DEF-0177 An error occurred while performing operation 'sqlPrepareWithOptions' status='-56'.`	To resolve this problem, complete the following tasks: • Verify that the summarization and pruning agent is working correctly. • Generate data for all the summarization types. • Verify that the warehouse is collecting historical data.
When you run a report, the report is not displayed in the correct format and the following error message is displayed: `RQP-DEF-0177 An error occurred while performing operation 'sqlPrepareWithOptions' status='-16'.`	This problem occurs due to incorrect data source. To resolve this problem, complete the following tasks: • Verify that the datasource configuration parameters are configured correctly. • Verify that the specified values for the parameters of the summarization and pruning agent such as database URL, driver user, and password match with the values of these parameters on the database.
If data is not available in the database for the selected parameters, the following error message is displayed after querying these parameters: `Empty data set No data returned by query. Try another set of parameters.`	To resolve this error, complete the following tasks: • Configure the summarization and pruning agent and verify that it is working correctly. • Generate data for all the summarization types in the database.
Reports are not generated correctly in the Microsoft Excel format.	There are some limitations to generate reports in the Microsoft Excel format. (http://pic.dhe.ibm.com/infocenter/cx/v10r1m0/topic/com.ibm.swg.ba.cognos.ug_cr_rptstd.10.1.0.doc/c_excel_limitations.html)
When you view a report spanning multiple pages in the PDF format, the report parameters section is displayed at the top of each page.	No solution is available for this problem at this time.
Charts are not displayed correctly in Microsoft Excel 2007.	No solution is available for this problem at this time.

Table 11. Tivoli Common Reporting for Microsoft SQL Server problems and solutions (continued)	
Problem	**Solution**
Labels for some charts are displayed in the HTML output, but are not displayed in the PDF output.	The font size is rendered differently in the HTML and the PDF output. In the PDF output, some fonts are not displayed because of the large font size. To resolve this issue, reduce the font size by completing the following steps: 1. Open the report in Report Studio. 2. Click the chart. 3. In the chart properties, select **Font**. 4. Modify the font properties, such as family, size, weight, and style. 5. Save the settings, and run the report in the PDF format.
Images are not displayed correctly when you run the reports in the Tivoli Common Reporting Server V3.1.	To view images, extract the report package and copy all the images in the package to the following locations: • `TCR Server Installation Drive \Program Files\IBM\JazzSM\profile \installedApps\JazzSMNode01Cell\IBM Cognos.ear\p2pd.war\tivoli \tcr_common\images` • `TCR Server Installation Drive \Program Files\IBM\JazzSM\reporting \cognos\webcontent\tivoli\tcr_common \images` For more information about copying images, see the "Copying report images to the server" topic in the IBM Tivoli Systems Management Information Center (http://pic.dhe.ibm.com/infocenter/tivihelp/v3r1/topic/com.ibm.psc.doc_1.1.0.1/tcr_original/ttcr_copying_images.html).
The value of the Not collected attribute is incorrectly displayed as -0.01 in the warehouse database. Similarly, the value of the Not applicable attribute is incorrectly displayed as -0.02 in the warehouse database. While designing Tivoli Common Reporting reports, the value -0.01 must be displayed as Not collected, and the value -0.02 must be displayed as Not applicable in the reports. The correct value for the Not collected attribute is -1 and the correct value for the Not applicable attribute is -2.	No solution is available for this problem at this time.

Chapter 4. Support information

If you have a problem with your IBM software, you want to resolve it quickly.

IBM provides the following ways for you to obtain the support you need:

Online

The following websites contain troubleshooting information:

- Go to the IBM Software Support website (http://www.ibm.com/support/entry/portal/software) and follow the instructions.
- Go to the Application Performance Management page in Service Management Connect (http://www.ibm.com/developerworks/servicemanagement/apm/index.html). Feel free to contribute to the wikis, blogs, and forums.

IBM Support Assistant

The IBM Support Assistant (ISA) is a free local software serviceability workbench that helps you resolve questions and problems with IBM software products. The ISA provides quick access to support-related information and serviceability tools for problem determination. To install the ISA software, go to the IBM Support Assistant website (http://www.ibm.com/software/support/isa).

Appendix A. Documentation library

A variety of documentation is available for insert the short product name from the list.

IBM Knowledge Center contains topics of information for the product and links to relevant PDFs. In IBM Knowledge Center, you can create a custom PDF that contains only the topics in which you are interested. See the directions for Creating your own set of topics (http://www.ibm.com/support/knowledgecenter/doc/kc_help.html#create).

Prerequisite documentation

To use the information about the components effectively, you must have some prerequisite knowledge.

The following information for Tivoli Monitoring is available in the IBM Knowledge Center (http://www.ibm.com/support/knowledgecenter) to gain prerequisite knowledge:

- *IBM Tivoli Monitoring Administrator's Guide*
- *IBM Tivoli Monitoring Installation and Setup Guide*
- *IBM Tivoli Monitoring High Availability Guide for Distributed Systems*
- IBM Tivoli Monitoring: Installation and Configuration Guides for the following agents: Operating System agents and Warehouse agents
- IBM Tivoli Monitoring: User's Guides for the following agents: Agentless OS monitors, Log File agent, System p agents, Systems Director base agent
- *IBM Tivoli Monitoring Agent Builder User's Guide*
- *IBM Tivoli Monitoring Command Reference*
- *IBM Tivoli Monitoring: Messages*
- *IBM Tivoli Monitoring Troubleshooting Guide*
- IBM Tivoli Monitoring: References for the following agents: Operating System agents and Warehouse agents
- IBM Tivoli Monitoring: Troubleshooting Guides for the following agents: Operating System agents and Warehouse agents
- *Tivoli Enterprise Portal User's Guide*

Related documentation

The documentation for related products provides useful information.

See the following products in IBM Knowledge Center (http://www.ibm.com/support/knowledgecenter/):

- Tivoli Monitoring
- Tivoli Application Dependency Discovery Manager
- Tivoli Business Service Manager
- Tivoli Common Reporting
- Tivoli Enterprise Console
- Tivoli Netcool/OMNIbus

Terminology that is relevant to IBM products is consolidated in one convenient locations at the IBM Terminology website (http://www.ibm.com/software/globalization/terminology).

Tivoli Monitoring Community on Service Management Connect

Service Management Connect (SMC) is a repository of technical information that is organized by communities.

Access Service Management Connect at https://www.ibm.com/developerworks/servicemanagement.

For information about Tivoli products, see the Application Performance Management community (http://www.ibm.com/developerworks/servicemanagement/apm/index.html).

Connect, learn, and share with Service Management professionals. Get access to developers and product support technical experts who provide their perspectives and expertise. You can use SMC for these purposes:

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

Other sources of documentation

You can obtain additional technical documentation about monitoring products from other sources.

See the following sources of technical documentation about monitoring products:

- IBM Integrated Service Management Library (http://www.ibm.com/software/brandcatalog/ismlibrary/) is an online catalog that contains integration documentation as well as other downloadable product extensions.
- IBM Redbook publications (http://www.redbooks.ibm.com/) include Redbooks® publications, Redpapers, and Redbooks technotes that provide information about products from platform and solution perspectives.
- Technotes (http://www.ibm.com/support/entry/portal/software), which are found through the IBM Software Support website, provide the latest information about known product limitations and workarounds.

Conventions used in the documentation

Several conventions are used in the documentation for special terms, actions, commands, and paths that are dependent on your operating system.

Typeface conventions

The following typeface conventions are used in the documentation:

Bold

- Lowercase commands, mixed-case commands, parameters, and environment variables that are otherwise difficult to distinguish from the 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:**)
- Keywords and parameters in text

Italic

- Citations (examples: titles of publications, CDs, and DVDs)
- Words and phrases defined in text (example: a nonswitched line is called a *point-to-point line*)

- Emphasis of words and letters (example: The LUN address must start with the letter *L*.)
- New terms in text , except in a definition list (example: a *view* is a frame in a workspace that contains data.)
- Variables and values you must provide (example: where *myname* represents...)

`Monospace`

- Examples and code examples
- File names, directory names, path names, programming keywords, properties, and other elements that are difficult to distinguish from the surrounding text
- Message text and prompts
- Text that you must type
- Values for arguments or command options

`Bold monospace`

- Command names, and names of macros and utilities that you can type as commands
- Environment variable names in text
- Keywords
- Parameter names in text: API structure parameters, command parameters and arguments, and configuration parameters
- Process names
- Registry variable names in text
- Script names

Operating system-dependent variables and paths

The direction of the slash for directory paths might vary in the documentation. Regardless of what you see in the documentation, follow these guidelines:

- For UNIX or Linux, use a forward slash (**/**).
- For Windows, use a backslash (****).

The names of environment variables are not always the same in Windows and UNIX. For example, %TEMP% in Windows is equivalent to $TMPDIR in UNIX or Linux.

For environment variables, follow these guidelines:

- For UNIX or Linux, use **$***variable*.
- For Windows, use **%***variable***%**.

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

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