

IBM Tivoli Monitoring for Virtual Environments Agent for  
VMware VI  
Version 7.2 Fix Pack 2

*User's Guide*





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**Note**

Before using this information and the product it supports, read the information in “Notices” on page 419.

This edition applies to version 7.2 Fix Pack 2 of IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI (product number 5724-L92) and to all subsequent releases and modifications until otherwise indicated in new editions.

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## Chapter 1. Overview of the agent

The IBM® Tivoli® Monitoring for Virtual Environments Agent for VMware VI (product code VM) provides you with the capability to monitor VMware Virtual Center. You can also use the agent to take basic actions with the VMware Virtual Center.

IBM Tivoli Monitoring is the base software for the VMware VI agent. The VMware VI agent monitors the following functions:

- Resource
- Event log
- Historical data

---

### IBM Tivoli Monitoring

IBM Tivoli Monitoring provides a way to monitor the availability and performance of all the systems in your enterprise from one or several designated workstations. It also provides useful historical data that you can use to track trends and to troubleshoot system problems.

You can use IBM Tivoli Monitoring to achieve the following tasks:

- Monitor for alerts on the systems that you are managing by using predefined situations or custom situations.
- Establish your own performance thresholds.
- Trace the causes leading to an alert.
- Gather comprehensive data about system conditions.
- Use policies to take actions, schedule work, and automate manual tasks.

The Tivoli Enterprise Portal is the interface for IBM Tivoli Monitoring products. You can use the consolidated view of your environment as seen in the Tivoli Enterprise Portal to monitor and resolve performance issues throughout the enterprise.

See the IBM Tivoli Monitoring publications listed in “Prerequisite publications” on page 417 for complete information about IBM Tivoli Monitoring and the Tivoli Enterprise Portal.

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### Functions of the monitoring agent

#### Resource monitoring

Collects monitoring information for memory, CPU, system, disk, and network usage for the VMware ESX server and the virtual machines. In addition, the agent collects monitoring information for power usage for the VMware ESX server.

#### Actions

Provides actions to start and stop the virtual machines installed on the VMware ESX server.

#### Integration

Uses additional IBM Tivoli Monitoring components to provide an in-depth view of the environment. Navigation links are provided to operating system agents that can be installed within virtual machines and the service console of ESX. Data views from the IBM Tivoli Monitoring for Virtual Environments Agent for NetApp Storage provide information for NAS data stores and detailed physical device metrics. The agent also integrates with IBM Systems Director V6.1.1.2, which provides additional management functions.

### Historical data

Provides a history enablement file that provides the ability to generate reports for all metrics collected.

### Event monitoring

Monitors events, tasks, and alarms generated by VMware Virtual Center and VMware ESX servers.

---

## New in this release

For version 7.2 Fix Pack 2 of the VMware VI agent, the following enhancements were made since version 7.2.

- Changes related to system requirements. See the information about system requirements in Software product compatibility reports (<http://publib.boulder.ibm.com/infocenter/prodguid/v1r0/clarity/index.html>).
- New attribute groups:
  - Distributed Virtual Switch Health
- New or changed attributes in the following attribute groups:
  - Clustered Datastores
  - Clustered Resource Pools
  - Clustered Servers
  - Clustered Virtual Machines
  - Clusters
  - Datastore Cluster
  - Datastores
  - Distributed Virtual Portgroups
  - Distributed Virtual Switches
  - Distributed Virtual Uplinks
  - Events
  - Networked Servers
  - Networked Virtual Machines
  - Networked Virtual Switches
  - Virtual Machines
  - Virtual Switches
  - VM Datastore Utilization
- New or changed views:
  - DVS Host Member Health
- New or changed situations:
  - KVM\_Cluster\_Bad\_Status
  - KVM\_Host\_Server\_Bad\_Status
  - KVM\_VM\_Bad\_Status
- Added information about the cluster current EVC mode, host system current EVC mode, and max EVC mode.
- Added the feature of monitoring Datastore free space percentage (%) at the datastore cluster level.
- Added the feature of monitoring network health on hosts on the distributed virtual switch.
- Added feature of capturing FT\_Machin\_UUID and Instance\_UUID of the Fault Tolerant virtual machine.

- Added a cross-link in the Distributed Virtual Switch view of the Network workspace to go to the Distributed Virtual Switch Details workspace.
- Added a cross-link in the Distributed Virtual Switch view of the Network workspace to go to the Alarms workspace.

---

## Components of the IBM Tivoli Monitoring environment

After you install and set up the VMware VI agent, you have an environment that contains the client, server, and monitoring agent implementation for Tivoli Monitoring.

This Tivoli Monitoring environment contains the following components:

### **Tivoli Enterprise Portal client**

The portal has a user interface based on Java™ for viewing and monitoring your enterprise.

### **Tivoli Enterprise Portal Server**

The portal server is placed between the client and the Tivoli Enterprise Monitoring Server and enables retrieval, manipulation, and analysis of data from the monitoring agents. The Tivoli Enterprise Portal Server is the central repository for all user data.

### **Tivoli Enterprise Monitoring Server**

The monitoring server acts as a collection and control point for alerts received from the monitoring agents, and collects their performance and availability data. The Tivoli Enterprise Monitoring Server is also a repository for historical data.

### **Tivoli Enterprise Monitoring Agent, VMware VI agent**

This monitoring agent collects data and distributes the data to the Tivoli Enterprise Monitoring Server, Tivoli Enterprise Portal Server, Tivoli Enterprise Portal, Tivoli Data Warehouse, and Tivoli Integrated Portal.

This agent can run on a separate system from the system where the VMware Virtual Center is running.

Multiple copies of this agent can run on the same system.

### **IBM Tivoli Netcool/OMNIBus**

Tivoli Netcool/OMNIBus is an optional component and the recommended event management component. The Netcool/OMNIBus software is a service level management (SLM) system that delivers real-time, centralized monitoring of complex networks and IT domain events. Event information is tracked in a high-performance, in-memory database and presented to specific users through individually configurable filters and views. The software includes automation functions that you can use to perform intelligent processing on managed events. You can use this software to forward events for Tivoli Monitoring situations to Tivoli Netcool/OMNIBus.

### **IBM Tivoli Enterprise Console**

The Tivoli Enterprise Console® is an optional component that acts as a central collection point for events from various sources, including events from other Tivoli software applications, Tivoli partner applications, custom applications, network management platforms, and relational database systems. You can view these events through the Tivoli Enterprise Portal (by using the event viewer), and you can forward events from Tivoli Monitoring situations to the Tivoli Enterprise Console component. If you do not already use Tivoli Enterprise Console and need an event management component, you can choose to use IBM Tivoli Netcool/OMNIBus.

### **IBM Tivoli Common Reporting**

Tivoli Common Reporting is a separately installable feature available to users of Tivoli software that provides a consistent approach to generating and customizing reports. Some individual products provide reports that are designed for use with Tivoli Common Reporting and have a consistent look and feel. For IBM Tivoli Monitoring for Virtual Environments, you can use Tivoli Common Reporting as a separate installation or as part of the IBM Tivoli Monitoring for Virtual Environments Performance and Capacity Management Reports capability.

## **IBM Tivoli Monitoring for Virtual Environments Dashboard, reporting, and Capacity Planner capabilities**

The dashboard capability provides a summary view of the health of the entire environment so you can quickly assess if a problem exists and take action to address the problem. Predefined performance and capacity management reports provide a complete assessment of the capacity (including forecast) of the virtual environment based on actual historical usage. With capacity planner analytics and reports you can create what-if planning scenarios that can be used to optimize and consolidate the virtual environment.

## **IBM Tivoli Application Dependency Discovery Manager (TADDM)**

TADDM delivers automated discovery and configuration tracking capabilities to build application maps that provide real-time visibility into application complexity.

## **IBM Tivoli Business Service Manager**

The Tivoli Business Service Manager component delivers real-time information to help you respond to alerts effectively based on business requirements. Optionally, you can use this component to meet service-level agreements (SLAs). Use the Tivoli Business Service Manager tools to help build a service model that you can integrate with Tivoli Netcool/OMNIBUS alerts or optionally integrate with data from an SQL data source. Optional components provide access to data from other IBM Tivoli applications such as Tivoli Monitoring and TADDM.

## **IBM Dashboard Application Services Hub**

The Dashboard Application Services Hub has a core set of components that provide such administrative essentials as network security and database management. This component replaces the Tivoli Integrated Portal component after version 2.2.

## **Tivoli Integrated Portal**

Tivoli Integrated Portal helps the interaction and secure passing of data between Tivoli products through a common portal. You can launch from one application to another and within the same dashboard view research different aspects of your managed enterprise. This component is installed automatically with the first Tivoli product that uses the Tivoli Integrated Portal framework. Subsequent products can install updated versions of Tivoli Integrated Portal. After version 2.2, this component is replaced by the Dashboard Application Services Hub.

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## **Agent Management Services**

You can use IBM Tivoli Monitoring Agent Management Services to manage the VMware VI agent.

Agent Management Services is available for the following IBM Tivoli Monitoring OS agents: Windows, Linux, and UNIX. The services are designed to keep the VMware VI agent available, and to provide information about the status of the product to the Tivoli Enterprise Portal. IBM Tivoli Monitoring V6.2.2, Fix Pack 2 or later provides support for Agent Management Services. For more information about Agent Management Services, see *Agent Management Services* in the *IBM Tivoli Monitoring Administrator's Guide*.

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## **User interface options**

Installation of the base IBM Tivoli Monitoring software and other integrated applications provides various interfaces that you can use to work with your resources and data.

The following interfaces are available:

### **Tivoli Enterprise Portal user interface**

You can run the Tivoli Enterprise Portal as a desktop application or a browser application. The client interface is a graphical user interface (GUI) based on Java on a Windows or Linux workstation. The browser application is automatically installed with the Tivoli Enterprise Portal Server. The desktop application is installed by using the Tivoli Monitoring installation media or

with a Java Web Start application. To start the Tivoli Enterprise Portal browser client in your Internet browser, enter the URL for a specific Tivoli Enterprise Portal browser client installed on your Web server.

### **Command-line interface**

You can use Tivoli Monitoring commands to manage the Tivoli Monitoring components and their configuration. You can also run commands at the Tivoli Enterprise Console event server or the Tivoli Netcool/OMNIBus ObjectServer to configure event synchronization for enterprise situations.

### **Manage Tivoli Enterprise Monitoring Services window**

You can use the window for the Manage Tivoli Enterprise Monitoring Services utility to configure the agent and start Tivoli services not designated to start automatically.

### **IBM Tivoli Netcool/OMNIBus event list**

You can use the Netcool/OMNIBus event list to monitor and manage events. An event is created when the Netcool/OMNIBus ObjectServer receives an event, alert, message, or data item. Each event is made up of columns (or fields) of information that are displayed in a row in the ObjectServer alerts.status table. The Tivoli Netcool/OMNIBus web GUI is also a web-based application that processes network events from one or more data sources and presents the event data in various graphical formats.

### **IBM Tivoli Enterprise Console**

You can use the Tivoli Enterprise Console to help ensure the optimal availability of an IT service for an organization. The Tivoli Enterprise Console is an event management application that integrates system, network, database, and application management. If you do not already use Tivoli Enterprise Console and need an event management component, you can choose to use Tivoli Netcool/OMNIBus.

### **IBM Tivoli Common Reporting**

Use the Tivoli Common Reporting web user interface for specifying report parameters and other report properties, generating formatted reports, scheduling reports, and viewing reports. This user interface is based on the Dashboard Application Services Hub for Tivoli Common Reporting 3.1 and on Tivoli Integrated Portal for earlier versions. Use the Tivoli Common Reporting web user interface when you installed Tivoli Common Reporting separately. In this interface, you specify report parameters and other report properties, generate formatted reports, schedule reports, and view reports. This user interface is based on the Dashboard Application Services Hub for Tivoli Common Reporting 3.1 and on Tivoli Integrated Portal for earlier versions.

### **IBM Tivoli Monitoring for Virtual Environments Dashboard, reporting, and Capacity Planner capabilities**

This user interface is based on the Tivoli Integrated Portal. The Dashboard provides predefined contextual summary views of the health (availability, performance, and capacity) of the complete virtual environment. Performance and Capacity Management Reports provides predefined Cognos-based reports that contain historical data, and a data model with tools for creating ad hoc reports. Capacity Planner provides you with a tool to import data for analysis and observe trends and patterns that you use to generate recommendations and create reports in the dashboard.

### **IBM Tivoli Application Dependency Discovery Manager**

The Discovery Management Console is the TADDM client user interface for managing discoveries.

### **IBM Tivoli Business Service Manager**

The Tivoli Business Service Manager console provides a graphical user interface that you can use to logically link services and business requirements within the service model. The service model provides an operator with a second-by-second view of how an enterprise is performing at any moment in time or how the enterprise performed over a time period.

### **IBM Dashboard Application Services Hub**

The Dashboard Application Services Hub provides an administrative console for applications that

use this framework. It is a web-based console that provides common task navigation for products, aggregation of data from multiple products into a single view, and the passing of messages between views from different products. This interface replaces the Tivoli Integrated Portal component after version 2.2.

### **Tivoli Integrated Portal**

Web-based products that are built on the Tivoli Integrated Portal framework share a common user interface where you can launch applications and share information. After version 2.2, this interface is replaced by the Dashboard Application Services Hub.

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## **Data sources**

Monitoring agents collect data from specific data sources.

The VMware VI agent collects data from the following sources:

### **Scripts**

The agent uses application-specific commands and interfaces to gather metrics.

---

## Chapter 2. Agent installation and configuration

Agent installation and configuration requires the use of the *IBM Tivoli Monitoring Installation and Setup Guide* and agent-specific installation and configuration information.

To install and configure the VMware VI agent, use the “Installing monitoring agents” procedures in the *IBM Tivoli Monitoring Installation and Setup Guide* along with the agent-specific installation and configuration information.

If you are installing silently by using a response file, see *Performing a silent installation of IBM Tivoli Monitoring* in the *IBM Tivoli Monitoring Installation and Setup Guide*.

---

### Requirements

Before installing and configuring the agent, make sure your environment meets the requirements for the IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI.

For information about system requirements, see the Software product compatibility reports (<http://publib.boulder.ibm.com/infocenter/prodguid/v1r0/clarify/index.html>). Search for the Tivoli Monitoring for Virtual Environments product.

For information about requirements, see the Prerequisites topic for the agent in the IBM Tivoli Monitoring for Virtual Environments Information Center ([http://pic.dhe.ibm.com/infocenter/tivihelp/v61r1/topic/com.ibm.tivoli.itmvs.doc\\_7.2.0.2/welcome\\_ve72fp2.htm](http://pic.dhe.ibm.com/infocenter/tivihelp/v61r1/topic/com.ibm.tivoli.itmvs.doc_7.2.0.2/welcome_ve72fp2.htm)).

---

### Language pack installation

The steps for installing language packs depend on which operating system and mode of installation you are using.

To install a language pack for the agent support files on the Tivoli Enterprise Monitoring Server, the Tivoli Enterprise Monitoring Agent, and the Tivoli Enterprise Portal Server, make sure that you installed the product in the English language. Then use the steps for the operating system or mode of installation you are using:

- “Installing language packs on Windows systems”
- “Installing language packs on UNIX or Linux systems” on page 8
- “Silent installation of language packs on Windows, UNIX, or Linux systems” on page 8

### Installing language packs on Windows systems

You can install the language packs on a Windows system.

#### Before you begin

First, make sure that you installed the product in the English language.

#### Procedure

1. On the language pack CD, double-click the `lpinstaller.bat` file to start the installation program.
2. Select the language of the installer and click **OK**.
3. In the Introduction panel, click **Next**
4. Click **Add/Update** and click **Next**.



5. Select the folder where the National Language Support package (NLSPackage) files are located. Typically, the NLSPackage files are located in the `nlspackage` folder where the installer executable file is located.
6. Select the language support for the agent of your choice and click **Next**. To make multiple selections, press Ctrl and select the language that you want.
7. Select the languages that you want to install and click **Next**.
8. Examine the installation summary page and click **Next** to begin installation.
9. After installation completes, click **Finish** to exit the installer.
10. Restart the Tivoli Enterprise Portal, Tivoli Enterprise Portal Server, and Eclipse Help Server if any of these components are installed.

## Installing language packs on UNIX or Linux systems

You can install the language packs on a UNIX or Linux system.

### Before you begin

First, make sure that you installed the product in the English language.

### Procedure

1. Enter the `mkdir` command to create a temporary directory on the computer, for example, `mkdir dir_name`. Make sure that the full path of the directory does not contain any spaces.
2. Mount the language pack CD to the temporary directory that you created.
3. Enter the following command to start the installation program: `cd dir_name lpinstaller.sh -c install_dir` where `install_dir` is where you installed IBM Tivoli Monitoring. Typically, the directory name is `/opt/IBM/ITM` for UNIX and Linux systems.
4. Select the language of the installer and click **OK**.
5. In the Introduction panel, click **Next**.
6. Click **Add/Update** and click **Next**.
7. Select the folder where the National Language Support package (NLSPackage) files are located. Typically, the NLSPackage files are located in the `nlspackage` folder where the installer executable file is located.
8. Select the language support for the agent of your choice and click **Next**. To make multiple selections, press Ctrl and select the language that you want.
9. Select the languages that you want to install and click **Next**.
10. Examine the installation summary page and click **Next** to begin installation.
11. After installation completes, click **Finish** to exit the installer.
12. Restart the Tivoli Enterprise Portal, Tivoli Enterprise Portal Server, and Eclipse Help Server if any of these components are installed.

## Silent installation of language packs on Windows, UNIX, or Linux systems

You can use the silent-mode installation method to install the language packs. In silent mode, the installation process obtains the installation settings from a predefined response file. It does not prompt you for any information.

### Before you begin

First, make sure that you installed the product in the English language.



## Procedure

1. Copy and paste the ITM\_Agent\_LP\_silent.rsp response file template as shown in “Response file example.”
2. Change the following parameter settings:

### NLS\_PACKAGE\_FOLDER

Folder where the National Language Support package (NLSPackage) files are located. Typically, the NLSPackage files are located in the nlspackage folder, for example:  
NLS\_PACKAGE\_FOLDER = //tmp//LP//nlspackage.

### PROD\_SELECTION\_PKG

Name of the language pack to install. Several product components can be included in one language package. You might want to install only some of the available components in a language pack.

### BASE\_AGENT\_FOUND\_PKG\_LIST

Agent for which you are installing language support. This value is usually the same as *PROD\_SELECTION\_PKG*.

### LANG\_SELECTION\_LIST

Language you want to install.

3. Enter the command to install the language pack with a response file (silent installation):

- For Windows systems:  
lpinstaller.bat -f *path\_to\_response\_file*
- For UNIX or Linux systems:  
lpinstaller.sh -c *candle\_home* -f *path\_to\_response\_file*

where *candle\_home* is the IBM Tivoli Monitoring base directory.

## Response file example

```
# IBM Tivoli Monitoring Agent Language Pack Silent Installation Operation
#
#This is a sample response file for silent installation mode for the IBM Tivoli
#Monitoring Common Language Pack Installer.
#
#This file uses the IBM Tivoli Monitoring Common Agent Language Pack with the
#install package as an example.
#Note:
#This response file is for the INSTALLATION of language packs only.
#This file does not support UNINSTALLATION of language packs in silent mode.
#-----
#-----
#To successfully complete a silent installation of the the example of Common Agent
#localization pack, complete the following steps:
#
#1.Copy ITM_Agent_LP_silent.rsp to the directory where lpinstaller.bat or
#lpinstaller.sh is located (IBM Tivoli Monitoring Agent Language Pack build
#location).
#
#2.Modify the response file so that it is customized correctly and completely for
#your site.
# Complete all of the following steps in the response file.
#
#3.After customizing the response file, invoke the silent installation using the
#following command:
#For Windows:
# lpinstaller.bat -f <path_to_response_file>
#For UNIX and Linux:
# lpinstaller.sh -c <candle_home> -f <path_to_response_file>
#Note:<candle_home> is the IBM Tivoli Monitoring base directory.
#-----
```

```

#-----
#Force silent install mode.
#-----
INSTALLER_UI=silent
#-----
#Run add and update actions.
#-----
CHOSEN_INSTALL_SET=ADDUPD_SET
#-----
#NLS Package Folder, where the NLS Packages exist.
#For Windows:
#   Use the backslash-backslash(\\) as a file separator (for example,
#C:\\zosgm\\LCD7-3583-01\\nlspackage).
#For UNIX and Linux:
#   Use the slash-slash (//) as a file separator (for example,
#//installtiviali//lpsilenttest//nlspackage).
#-----
#NLS_PACKAGE_FOLDER=C:\\zosgm\\LCD7-3583-01\\nlspackage
NLS_PACKAGE_FOLDER=//tmp//LP//nlspackage
#-----
#List the packages to process; both variables are required.
#Each variable requires that full paths are specified.
#Separate multiple entries with a semicolon (;).
#For Windows:
#       Use the backslash-backslash(\\) as a file separator.
#For Unix and Linux:
#       Use the slash-slash (//) as a file separator.
#-----
#PROD_SELECTION_PKG=C:\\zosgm\\LCD7-3583-01\\nlspackage\\KIP_NLS.nlspkg
#BASE_AGENT_FOUND_PKG_LIST=C:\\zosgm\\LCD7-3583-01\\nlspackage\\KIP_NLS.nlspkg
PROD_SELECTION_PKG=//tmp//LP//nlspackage//kex_nls.nlspkg;//tmp//LP//nlspackage//
koq_nls.nlspkg
BASE_AGENT_FOUND_PKG_LIST=//tmp//LP//nlspackage//kex_nls.nlspkg;//
tmp//LP//nlspackage//koq_nls.nlspkg
#-----
#List the languages to process.
#Separate multiple entries with semicolons.
#-----
LANG_SELECTION_LIST=pt_BR;fr;de;it;ja;ko;zh_CN;es;zh_TW

```

---

## Prerequisites checking

The prerequisite checker utility verifies whether all the prerequisites that are required for the agent installation are met. The prerequisite checker creates a log file that contains a report of all the prerequisites checks when the prerequisite checker was run.

For the VMware VI agent, the prerequisite checker verifies the following requirements:

- Memory
- Disk Space
- Operating systems

For detailed information about installation prerequisites, see the Prerequisites topic for the agent in the IBM Tivoli Monitoring for Virtual Environments Information Center ([http://pic.dhe.ibm.com/infocenter/tivihelp/v61r1/topic/com.ibm.tivoli.itmvs.doc\\_7.2.0.2/welcome\\_ve72fp2.htm](http://pic.dhe.ibm.com/infocenter/tivihelp/v61r1/topic/com.ibm.tivoli.itmvs.doc_7.2.0.2/welcome_ve72fp2.htm)).

You can run the prerequisite checker in stand-alone mode or remotely. For more information about the prerequisite checker, see “Prerequisite Checking for IBM Tivoli Monitoring Agents” in the *IBM Tivoli Monitoring Installation and Setup Guide*.

---

## Installing and configuring the monitoring agent

While completing the steps to install and configure the VMware VI agent as described in the IBM Tivoli Monitoring Installation and Setup Guide, “Installing monitoring agents,” use the agent-specific configuration information that is provided in this chapter.

Agent-specific information is provided for the following procedures:

- “Before you begin installation and configuration”
- “Local installation” on page 12
- “Local configuration” on page 14
- “Remote installation and configuration” on page 15

## Before you begin installation and configuration

Complete the following tasks before you begin any installation or configuration steps:

1. Review the hardware and software prerequisites.
2. Review the installation and configuration information in Chapter 8, “Troubleshooting,” on page 323.
3. Create a user ID in your VMware Virtual Infrastructure.

This user ID is used by the VMware VI agent to communicate with the VMware Virtual Center. The monitoring agent requires a user ID with System.View and System.Read privileges on all data source objects that are being monitored. To enable the PowerOnVM and PowerOffVM Take Action commands in the monitoring agent, the user ID must also have the following privileges:

- Virtual Machine-Interaction-Power On
- Virtual Machine-Interaction-Power Off

For more information about how to create the user ID in your VMware Virtual Infrastructure, see the VMware documentation for details on managing users, groups, permissions, and roles.

4. If the VMware VI agent is configured to communicate with its VMware VI data sources using the SSL agent, it might be necessary to add the SSL certificate of the data source to the certificate truststore of the agent. For complete details, see “Enabling SSL communication with VMware VI data sources” on page 12.
5. The IBM Systems Director Server requires user ID and password authentication. By default, the Tivoli Enterprise Portal user ID and password is in the encoded URL properties, eliminating the need for you to enter a user ID and password manually. However, you can also manually configure by entering a user ID and password. In this case, the session stays authenticated until the Tivoli Enterprise Portal is closed, or the IBM Systems Director session times out because of inactivity, allowing you to complete subsequent launches without re-entering the user ID and password. In either case, the user ID and password information is protected using the HTTPS protocol between the Tivoli Enterprise Portal and the IBM Systems Director Server.
6. If you plan to use optional integration with the IBM Tivoli Monitoring for Virtual Servers Agent for NetApp Storage, determine the MSN for the agent using the following information:
  - The MSN is in the following form: *instance name:system name:NU*.
  - The instance name is the instance name that was chosen for the NetApp Storage agent when it was configured.
  - The system name is the name of the computer where the agent is running.
  - The instance name and system name are followed by a colon.
  - A single instance of the Netapp Storage agent is supported at this time.
  - The correct managed system name is listed in the Tivoli Enterprise Portal Server client.
  - Select the **Enterprise** navigation item. Then, right-click, select the workspace, and select **Managed System Status**. The resulting workspace lists all the managed systems. The Netapp Storage agent managed system name ends with the letters NU.

Keep the number of instances of the VMware VI agent that you configure for the same data source to a minimum, preferably one. Additional instances of this monitoring agent increase the load on the VMware server, and provide redundant information.

## Selecting an installation location

The VMware VI agent can be installed on the same system as the vCenter, as long as it has sufficient capacity to do so.

Some advantages are as follows:

- No additional servers or administrative costs are required to manage your VMware environment.
- If network connectivity to the vCenter is lost, monitoring continues to run.
- Thresholds continue to be evaluated, automated corrective actions continue to run, and historical performance data continue to be gathered.
- Network traffic is reduced because of the monitoring of VMware.

If you plan to install the monitoring agent and the vCenter on the same system, ensure that there is sufficient capacity for both, including primary metrics of CPU, memory, disk space, disk I/O, and network bandwidth. The operating system level and patches for the system must meet the requirements of both the VMware VI agent and vCenter.

If you deploy an operating system cluster for the vCenter to achieve High Availability, then the monitoring agent can use clustering to achieve High Availability as well.

**Note:** Deploy the VMware VI agent on the same system as the vCenter if you have the available capacity.

If you do not have the required capacity on a vCenter system, be sure to select an appropriate server. To avoid installing and managing additional servers, find an existing server that has the capacity for the VMware VI agent.

If you have multiple vCenters, assign monitoring agents that monitor vCenters to a single server dedicated to monitoring VMware. Because monitoring is done remotely, choose a server close in proximity to your vCenter system to ensure higher availability for your data collection.

## Local installation

After the VMware VI agent is installed, if the monitoring agent is to communicate with the VMware VI component using SSL, determine whether you must add Signer Certificates to the VMware VI agent certificate database.

For complete details, see “Enabling SSL communication with VMware VI data sources.”

## VMware VI application support

All agents require that you install application support files that contain agent-specific information about the monitoring server, portal server, and portal desktop client.

See the *IBM Tivoli Monitoring Installation and Setup Guide*.

## Enabling SSL communication with VMware VI data sources

The VMware VI agent can be configured to securely communicate with its VMware data sources using SSL. In this configuration, you must add a data source SSL certificate to the certificate truststore of the agent.

**Important:** The following information applies only if the agent is configured to validate SSL certificates. If SSL certificate validation is turned off, the VMware VI agent connects to VMware data sources even if their SSL certificates are expired, untrusted, or invalid. However, turning off SSL certificate validation is potentially not secure and must be done with care.

If a VMware data source uses an SSL certificate that is signed by a common Certificate Authority (for example, Verisign, Entrust, or Thawte), then it is not necessary to add certificates to the VMware VI agent certificate truststore. However, if the data source uses a certificate that is not signed by a common Certificate Authority, as is the case by default, the certificate must be added to the truststore to allow the agent to successfully connect and collect data.

To add a certificate, use the following procedure:

**Note:**

1. The default VMware certificate file is named `rui.crt`.
2. For a Virtual Center, the SSL certificate file is located by default in `C:\Documents and Settings\All Users\Application Data\VMware\VMware VirtualCenter\SSL`.
3. For an ESX server, the SSL certificate file is located by default in the `/etc/vmware/ssl` directory.

**Steps**

1. Copy the certificate file from your data source to the agent computer.
2. Place the certificate file in a directory of your choosing on the agent computer. Do not overlay certificate files. Use unique file names for each certificate. Use a unique label for each certificate that you add.
3. Use the `keytool` command to add the data source certificate to the certificate truststore of the agent:

```
keytool -import -noprompt -trustcacerts -alias CertificateAlias -file  
CertificateFile -keystore Truststore -storepass TruststorePassword
```

where:

*CertificateAlias*

A unique reference for each certificate added to the certificate truststore of the agent, for example, an appropriate alias for the certificate from *datasource.example.com* is *datasource*.

*CertificateFile*

The complete path and file name to the VMware data source certificate being added to the truststore.

*Truststore*

Complete path and file name to the VMware VI agent certificate database. Use the following path and file name:

- Windows (32-bit): *install\_dir*\tmaitm6\kvm.truststore
- Windows (64-bit): *install\_dir*\tmaitm6\_x64\kvm.truststore
- Linux (32-bit): *install\_dir*/li6263/vm/etc/kvm.truststore
- Linux (64-bit): *install\_dir*/lx8266/vm/etc/kvm.truststore

*TruststorePassword*

ITMVMWAREVI is the default password for the VMware VI agent truststore. To change this password, consult the Java Runtime documentation for information about the tools to use.

**Important:** To use the `keytool` command, the Java Runtime bin directory must be in your path. Use the following commands:

- Windows (32-bit): set PATH=%PATH%;*install\_dir*\CNPSJ\java\bin
- Windows (64-bit): set PATH=%PATH%;*install\_dir*\CNPSJ\java\bin

- Linux (32-bit): `PATH="$PATH":install_dir/JRE/li6263/bin`
- Linux (64-bit): `PATH="$PATH":install_dir/JRE/lx8266/bin`

4. After all data source certificates have been added, you can start the monitoring agent.

## Local configuration

Use the procedure in the IBM Tivoli Monitoring Installation and Setup Guide to configure the agent on a Windows or Linux system.

The configuration attributes define which VMware VI data sources are monitored. The attributes define a connection to either a VMware Virtual Center 4.0+ or directly to an individual VMware ESX Server 3.5+. Multiple data sources can be defined for each VMware VI agent instance. More than one instance of the monitoring agent can be configured on a remote monitoring host system. One instance can monitor all VMware Virtual Infrastructure, or separate instances can be defined to monitor specific groups of VMware Virtual Infrastructure.

Monitor the VMware Virtual Center that manages the VMware Virtual Infrastructure instead of managing individual ESX Servers.

## Configuration values

For both local and remote configuration, provide the configuration values for the monitoring agent to operate. When configuring an agent, a panel is displayed so you can enter each value. When there is a default value, this value is pre-entered into the field. If a field represents a password, two entry fields are displayed. You must enter the same value in each field. The values that you type are not displayed to help maintain the security of these values.

The following fields are defined for this monitoring agent:

- On the **Data Provider** tab:

### Instance Name

The name of the instance. The maximum length is 32 characters and is restricted to alphanumeric characters. No spaces, underscores, or other special characters are permitted. This name is the instance name that was entered previously.

### Validate SSL Certificates

This value indicates whether the agent is to validate SSL certificates when using SSL to communicate over the network. Selecting **No** can lead to communications that are potentially not secure. Use caution when choosing not to validate SSL certificates. If **No** is selected, VMware data source certificates need not be added to the VMware VI agent truststore as described in “Enabling SSL communication with VMware VI data sources” on page 12.

### Maximum Number of Data Provider Log Files

The number of log files that the data provider produces before overwriting previous log files.

### Maximum Size in KB of Each Data Provider Log

The maximum amount of data (in KB) that the data provider writes to a single log file before creating a new log file.

### Level of Detail in Data Provider Log

The amount of detail that the data provider includes in its log files. Log levels include the following log messages:

- Off: No messages are logged.
- Severe: Only errors are logged.
- Warning: Everything that is logged at the Severe level and potential errors that may result in undesirable behavior.
- Info: Everything that is logged at the Warning level and high-level informational messages that describe the state of the data provider as it executes.

- Fine: Everything that is logged at the Info level and low-level informational messages that describe the state of the data provider as it executes.
  - Finer: Everything that is logged at the Fine level and plus highly-detailed informational messages, such as performance profiling information and debug data. Choosing this option may adversely affect the performance of the agent. This setting is intended only as a tool for problem determination in conjunction with IBM support staff.
  - Finest: Everything that is logged at the Fine level and the most detailed informational purposes, including low-level programming messages and data. Choosing this option may adversely affect the performance of the agent. This setting is intended only as a tool for problem determination in conjunction with IBM support staff.
  - All: All messages are logged.
- Optional: On the **IBM Systems Director** tab:
    - IBM Systems Director Server Host Name**  
Host name or IP address of the IBM Systems Director Server managing the environment. This option represents the Web UI that the server launches.
    - IBM Systems Director Server Port Number**  
Port number for the IBM Systems Director Server. The default is 8422.
    - Use credentials to authenticate to IBM Systems Director Server**  
Indicates whether to authenticate to the IBM Systems Director Server using the User ID and password. If you are not required to authenticate, you are asked to log into the IBM Systems Director Server manually.
  - On the **Storage Agent** tab:
    - ITM MSN of Storage Agent (KVM\_STORAGE\_AGENT\_MSN)**  
IBM Tivoli Monitoring managed system name of the IBM Tivoli Monitoring storage agent
  - On the **Data Source** tab:
    - Data Source ID**  
Unique identifier for this data source
    - Data Source Host Name**  
Data source where the agent collects monitoring data. This source can be a virtual center or an ESX host.
    - Use SSL Connection to Data Source**  
Restricted to **Yes** or **No**
    - Data Source User ID**  
User ID that you specify, that is known to the data source, and has sufficient privileges to collect monitoring data
    - Data Source Password**  
Password that you specify for the data source user ID

## Remote installation and configuration

You can use IBM Tivoli Monitoring to deploy monitoring agents from a central location, which is the monitoring server. You can also use the remote agent deployment function to configure deployed agents and install maintenance on your agents.

For information, see the *IBM Tivoli Monitoring Installation and Setup Guide*. See the *IBM Tivoli Monitoring Command Reference* for commands that you can use to perform these tasks.

Before you can deploy any agents from a monitoring server, you must first populate the agent depot with bundles. For information about populating your agent depot, see the *IBM Tivoli Monitoring Installation and Setup Guide*.



**Note:** When the VMware VI agent is configured to securely communicate with its VMware data sources using SSL, it might be necessary to add some or all of its data sources' SSL certificates to the certificate truststore of the agent, which is located on the agent system. See “Enabling SSL communication with VMware VI data sources” on page 12 for detailed information about adding certificates to the certificate truststore of the agent.

## Deploying through the portal

See the IBM Tivoli Monitoring Installation and Setup Guide for detailed information about deploying non-operating system agents.

## Deploying through the command line

See the IBM Tivoli Monitoring Installation and Setup Guide for detailed information about deploying non-operating system agents.

To deploy the VMware VI agent from the command line, use the **tacmd addSystem** command. See the *IBM Tivoli Monitoring Command Reference* for the full syntax of this command.

The VMware VI agent requires the following command:

```
tacmd addsystem -t vm -n OS_Agent_ManagedSystemName \  
-p INSTANCE=InstanceName \  
DATA_PROVIDER.KVM_SSL_VALIDATE_CERTIFICATES=ValidatesSSLCertificates \  
DATA_PROVIDER.KVM_LOG_FILE_MAX_COUNT=MaxLogFileCount \  
DATA_PROVIDER.KVM_LOG_FILE_MAX_SIZE=MaxLogFileSize \  
DATA_PROVIDER.KVM_LOG_LEVEL=LogLevel \  
DIRECTOR.KVM_DIRECTOR_AUTHENTICATION=DirectorAuthentication \  
DIRECTOR.KVM_DIRECTOR_HOST_ADDRESS=DirectorHostAddress \  
DIRECTOR.KVM_DIRECTOR_PORT_NUMBER=DirectorPortNumber \  
STORAGE_AGENT.KVM_STORAGE_AGENT_MSN=StorageAgentMSN \  
DATASOURCE:UniqueDataSourceID.HOST_ADDRESS=DataSourceHostAddress \  
DATASOURCE:UniqueDataSourceID.USERNAME=DataSourceUserID \  
DATASOURCE:UniqueDataSourceID.PASSWORD=DataSourcePassword \  
DATASOURCE:UniqueDataSourceID.USES_SSL=DataSourceUsesSSL
```

For additional data sources, repeat the DATASOURCE Section Parameters with a new *UniqueDataSourceID*.

In this command, the fields are defined as follows. For more information, refer to “Configuration values” on page 14.

*OS\_Agent\_ManagedSystemName*

The managed system name of the operating system agent that is running on the system where the VMware agent is to be remotely deployed.

*InstanceName*

The name of the instance

*ValidateSSLCertificates*

Whether the agent validates SSL certificates when using SSL to communicate over the network. Valid values are Yes and No.

*MaxLogFileCount*

The maximum number of data provider log files. Valid values are positive integers.

*MaxLogFileSize*

The maximum size in KB of each data provider log. Valid values are positive integers.

*LogLevel*

The level of detail in data provider logs. Valid values are OFF, SEVERE, WARNING, INFO, FINE, FINER, FINEST, and ALL.



#### *DirectorAuthentication*

Whether to authenticate to the IBM Systems Director Server using the IBM Tivoli Monitoring Tivoli Enterprise Portal user ID and password. This configuration parameter is optional. Valid values are Yes and No.

#### *DirectorHostAddress*

The IBM Systems Director host name. This value is optional.

#### *DirectorPortNumber*

The IBM Systems Director port number. Valid values are valid TCP port numbers. This value is optional.

#### *StorageAgentMSN*

The managed system name (MSN) of the IBM Tivoli Monitoring storage agent that monitors the physical storage devices for the VMware environment. This managed system name must belong to a NetApp Storage agent instance.

#### *UniqueDataSourceID*

The data source ID

#### *DataSourceHostAddress*

The data source host name

#### *DataSourceUserName*

The data source user ID

#### *DataSourcePassword*

The data source password

#### *DataSourceUsesSSL*

Whether to use SSL to connect to the data source. Valid values are Yes and No.

To configure several data sources, repeat the DATASOURCE section parameters with a new *UniqueDataSourceID*.

## **Increasing the Java heap size**

The default heap size for the Java data provider is 256 megabytes. In very large VMware environments, you might need to increase the heap size. If the Java data provider stops due to a javacore problem, and creates a file named `javacore.date.time.number.txt` in the `CANDLEHOME\tmaitm6` directory, and this file contains the string `java/lang/OutOfMemoryError`, then increase the heap size for the Java data provider.

Use the heap size value `-Xmx512m` for environments with more than 100 ESX hosts and more than 1000 virtual machines. For environments with more than 150 hosts and more than 2000 virtual machines, use the value `-Xmx1024m`.

To increase the heap size for the Java data provider, complete the following steps:

- On a Windows system:
  1. Open the file `%CANDLE_HOME%\TMAITM6\kvm_data_provider.bat`.
  2. Add the following line before the line that starts with `SET KVM_JVM_ARGS="$KVM_CUSTOM_JVM_ARGS...`  
`SET KVM_CUSTOM_JVM_ARGS=-Xmx512m`
  3. Restart the agent.
- On a Linux system:
  1. Open the file `$CANDLEHOME/platform/vm/bin/kvm_data_provider.sh`.
  2. Add the following line before the line that starts with `KVM_JVM_ARGS="$KVM_CUSTOM_JVM_ARGS...`  
`KVM_CUSTOM_JVM_ARGS=-Xmx512m`
  3. Restart the agent.

## Upgrade notes

See the IBM Tivoli Monitoring Installation and Setup Guide for more information about upgrading.

After version 6.1, the VMware VI agents changed the format in which VMware data source certificates are stored, because of changes in the underlying SSL implementation. Because of these changes, after upgrading you must add data source certificates to the certificate truststore of the agent, even if those certificates were in the certificate database of the previous agent. See “Enabling SSL communication with VMware VI data sources” on page 12.

---

## Chapter 3. Workspaces reference

A workspace is the working area of the Tivoli Enterprise Portal application window. The Navigator tree contains a list of the workspaces provided by the agent.

### About workspaces

Use the Navigator tree to select the workspace you want to see. As part of the application window, the status bar shows the Tivoli Enterprise Portal Server name and port number to which the displayed information applies and the ID of the current user.

When you select an item in the Navigator tree, a default workspace is displayed. When you right-click a Navigator item, a menu that includes a Workspace item is displayed. The Workspace item contains a list of workspaces for that Navigator item. Each workspace has at least one view. Some views have links to other workspaces. You can also use the Workspace Gallery tool as described in the *Tivoli Enterprise Portal User's Guide* to open workspaces.

The workspaces in the Navigator are displayed in a Physical view that shows your enterprise as a physical mapping or a dynamically populated logical view that is agent-specific. You can also create a Logical view. The Physical view is the default view.

This monitoring agent provides predefined workspaces. You cannot modify or delete the predefined workspaces, but you can create new workspaces by editing them and saving the changes with a different name.

The IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI provides various default workspaces. These workspaces are displayed in the Navigator tree under the following nodes and subnodes for this monitoring agent:

#### VMware VI

Corresponds to a VMware VI instance and contains agent instance-level workspaces.

#### VMware VI

Each subnode is an ESX server.

When multiple instances of the monitoring agent are defined on a system, the top-level node becomes VMware VI. The VMware VI workspace is undefined at this node. A node for each instance is created called *Instance::VM*. A workspace that is called *Instance::VM* is associated with the instance node. This workspace is comparable to the VMware VI workspace.

Workspace views can be any combination of query-based views, event views, and special purpose views.

### Additional information about workspaces

For more information about creating, customizing, and working with workspaces, see "Using workspaces" in the *Tivoli Enterprise Portal User's Guide*.

For a list of the predefined workspaces for this monitoring agent and a description of each workspace, see Predefined workspaces and the information about each individual workspace.

Some attribute groups for this monitoring agent might not be represented in the predefined workspaces or views for this agent. For a full list of the attribute groups, see "Attribute groups for the monitoring agent" on page 33.

If you are using remote management to navigate to your systems in the Tivoli Enterprise Portal, navigate from the host name of the computer where you installed the agent.

---

## Predefined workspaces

The VMware VI agent provides predefined workspaces, which are organized by Navigator item.

Agent-level navigator items

- VMware VI Navigator item
  - VMware VI workspace
  - IBM Systems Director workspace
  - Virtual Enterprise workspace
- Clusters Navigator item
  - Cluster Detail workspace
  - Cluster Performance workspace
  - Cluster Summary workspace
  - Clusters workspace
  - Distributed Resource Scheduler workspace
  - Virtual App workspace
- Datastores Navigator item
  - Datastore and Volumes workspace
  - Datastore Detail - NAS workspace
  - Datastore Detail - VMFS workspace
  - Datastores workspace
  - Topology - Datastore workspace
  - Virtual Machines Topology workspace
  - VM Datastore Utilization workspace
  - VM Orphaned Disk workspace
- Events Navigator item
  - Events workspace
  - Triggered Alarms workspace
- Monitored Servers Navigator item
  - Monitored Servers workspace
  - Topology - Monitored Servers workspace
  - Virtual Machines - Monitored Servers workspace
- Networks Navigator item
  - Distributed Network Detail workspace
  - Distributed Virtual Switch Detail workspace
  - Network Detail workspace
  - Network NIC Detail workspace
  - Networks workspace

VMware VI (ESX) subnode

- VMware VI Navigator item
  - VMware VI workspace
  - All Orphaned Virtual Machines workspace
  - All Virtual Machines workspace

- CPU Navigator item
  - CPU workspace
- Disk Navigator item
  - Disk workspace
  - Server Disk Detail workspace
  - Server Disk Performance workspace
- ESX Server Navigator item
  - Agent Health workspace
  - ESX Server workspace
  - Server DataStore workspace
  - Server Health workspace
- Memory Navigator item
  - Memory workspace
- Network Navigator item
  - Network workspace
- Resource Pools Navigator item
  - Resource Pools workspace
- Virtual Machines Navigator item
  - Virtual Machines workspace

---

## Workspace descriptions

Each workspace description provides information about the workspace such as the purpose and a list of views in the workspace.

Workspaces are listed under Navigator items. When the agent has subnodes, the Navigator items are listed under the subnode.

### VMware VI Navigator item

The workspace descriptions are organized by the Navigator item to which the workspaces are relevant.

#### VMware VI workspace

This workspace provides a snapshot of the health of clusters and data stores. Key indicators show the status to aid in problem identification.

This workspace contains the following views:

##### Clusters

This view contains key status and performance indicators for clusters. A link is provided to navigate to a workspace with more detailed information about this cluster.

##### Datastores

This view contains key status and performance indicators for data stores. A link is provided to navigate to a workspace with more detailed information about the data store.

##### Networks

This view displays all of the configured networks by data center and provides a summary of the health of the network. A link is provided to view the triggered alarms by network.

#### IBM Systems Director workspace

This workspace provides the IBM Systems Director Web UI to the Director Server this agent is configured to use. It is only available as a workspace link target.

This workspace contains the following view:

##### IBM Systems Director

This view contains the IBM Systems Director Server Web interface.

## **Virtual Enterprise workspace**

This workspace provides high-level views of the ESX servers that this agent is monitoring.

This workspace contains the following views:

### **Virtual Center Events**

This view contains events that were generated by a monitoring data source. The events are typically specific to the data source.

### **Monitored Servers**

This view shows the ESX servers that this agent is actively monitoring. Each entry in this view contains a link that provides navigation to the ESX Servers and IBM Systems Director workspaces. The IBM Systems Director workspaces require that an IBM Systems Director Server has been configured for the agent and shows the ESX Server in the IBM Systems Director Web UI.

## **Clusters Navigator item**

The workspace descriptions are organized by the Navigator item to which the workspaces are relevant.

### **Cluster Detail workspace**

This workspace contains views that are specific to one cluster. The metrics in the workspace are the detailed metrics of the cluster. The metrics include metrics that are configuration settings and metrics that represent a snapshot of some key performance metrics. Links to other workspaces provided by this agent are included in this workspace.

This workspace contains the following views:

#### **Cluster\_name - Datacenter\_Name**

This view contains a summary of memory and CPU usage for the selected cluster and an overall picture of the health of the cluster.

#### **CPU Utilization - Cluster\_Name - Datacenter\_Name**

This view contains a graph of the number of hosts operating within CPU usage ranges. This view allows a capacity planner or administrator to see how well the CPU resources of the cluster are being used across the entire cluster.

#### **Memory Utilization - Cluster\_Name - Datacenter\_Name**

This view contains a graph of the number of hosts operating within Memory usage ranges. This view allows a capacity planner or administrator to see how well the memory resources of the cluster are being used across the entire cluster.

#### **Navigator**

This view contains a navigation aid to quickly jump to views about the other known clusters.

### **Cluster Performance workspace**

This workspace contains views that are specific to one cluster.

This workspace contains the following views:

#### **vMotions vs Powered On for Cluster - Cluster\_Name - Datacenter\_Name**

This view uses a line graph over time to show the number of virtual machines in the given cluster that are powered on. The view also shows the number of virtual machines that have migrated. Historical data collection must be enabled for this view to contain data. See the IBM Tivoli Monitoring Administrator's Guide for details about how to create historical collection. A collection must be created for the Clusters attribute group.

#### **CPU vs Memory Utilization for Cluster - Cluster\_Name - Datacenter\_Name**

This view uses a line graph over time to show the usage of cluster resources CPU and memory. Historical data collection must be enabled for this view to contain data. See the IBM Tivoli Monitoring Administrator's Guide for details about how to create a historical collection. A collection must be created for the Clusters attribute group.

#### **Navigator**

This view contains a navigation aid to quickly jump to views about the other known clusters.

### **Cluster Summary workspace**

This workspace contains views that are specific to one cluster. The views in this workspace

provide a quick guide to all of the ESX servers, resource pools, and virtual machines that are contained within this cluster. Links are provided to quickly jump to a specific view.

This workspace contains the following views:

**ESX Servers - Cluster\_Name - Datacenter\_Name**

This view contains a list of the ESX servers that are members of this cluster. Basic performance data is shown for each server. By selecting the link within this view, you can quickly navigate to the ESX server view depicted in the row of data. The resulting workspace aids in providing additional detailed metrics regarding the ESX server. You can easily navigate back to this Cluster Summary workspace by selecting the appropriate icon.

**Resource Pools - Cluster\_Name - Datacenter\_Name**

This view contains a list of the resource pools that are the members of this cluster and shows the basic performance data for each resource pool. This view also provides a link to quickly navigate to the Virtual App workspace, and the link is available only if the Node Type is `kvm.Virtual_App`.

**Datastores - Cluster\_Name - Datacenter\_Name**

This view contains a list of the data stores that are members of this cluster. Basic performance data is shown for each data store.

**Virtual Machines - Cluster\_Name - Datacenter\_Name**

This view contains a list of the virtual machines that are members of this cluster. Basic performance data is shown for each virtual machine. By selecting the link within this view, you can quickly navigate to the virtual machine view specific to this virtual machine. The resulting workspace aids in providing additional detailed metrics regarding the virtual machine. You can easily navigate back to this Cluster Summary workspace by selecting the appropriate icon.

**Navigator**

This view contains a navigation aid to quickly jump to views about the other known clusters.

**Clusters workspace**

This workspace provides a snapshot of the defined clusters.

This workspace contains the following views:

**Clusters**

This view contains a list of all of the clusters and a summary of memory and CPU usage for each cluster. Each entry in this view contains a link that provides the ability to navigate to the Cluster Summary, Cluster Details, Distributed Resource Scheduler and IBM Systems Director workspaces. The latter requires that an IBM Systems Director Server has been configured for the agent and shows the Cluster in Topology Common view.

**Top 5 by CPU**

This view contains a list of the clusters that are ordered by CPU usage.

**Top 5 by Memory**

This view contains a list of the clusters that are ordered by memory usage.

**Bottom 5 by CPU**

This view contains a list of the clusters that are ordered by CPU usage.

**Bottom 5 by Memory**

This view contains a list of the clusters that are ordered by memory usage.

**Distributed Resource Scheduler workspace**

This workspace contains view that is specific to the Distributed Resource Scheduler (DRS) and Storage Distributed Resource Scheduler (SDRS) faults.

This workspace contains the following view:

**DRS Faults**

This view shows information about the DRS and SDRS faults that are associated with the clusters.



## **Virtual App workspace**

This workspace contains views that are specific to the virtual application.

This workspace contains the following view:

### **Virtual App**

This view shows information about the virtual machines and virtual applications that are associated with the virtual machines.

## **Datastores Navigator item**

The workspace descriptions are organized by the Navigator item to which the workspaces are relevant.

### **Datastore and Volumes workspace**

This workspace contains views that are specific to one data store. The metrics are supplied by both the IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI and the Agent for NetApp Storage. This workspace provides for both a virtual and a physical view of the data store. Use the Storage Agent tab on the configuration windows to set up the relationship between the agents.

This workspace contains the following views:

#### **Datastore Health**

This view shows configuration metrics from the virtualized environment. This view is primarily configuration data.

#### **Volume by Operations**

This view shows physical metrics about the I/O operations and is supplied by the Agent for NetApp Storage.

#### **Volume by Latency**

This view describes the latency of the data store on a physical volume.

#### **Volume by Transfer Rate**

This view describes the I/O transfer rates for this physical volume.

### **Datastore Detail - NAS workspace**

This workspace contains views that are specific to one data store. The metrics in the workspace are the detailed metrics of the data store. The metrics include metrics that are configuration settings and metrics that represent a snapshot of some key performance metrics.

This workspace contains the following views:

#### **Utilization**

This view displays graphically the usage percentage of this data store.

#### **Connections**

This view shows the dependencies of other virtualization components on this data store.

#### **Percent Used - History**

This view shows percentage used of this data store over time. The time period is configurable. This data helps identify trends and spikes that occur at various points in time. Historical collection must be enabled for this view to populate.

#### **Datastore Detail**

This view contains the detailed configuration specifications of this data store and additional usage metrics.

#### **Volumes**

This view contains data when an additional IBM Tivoli Monitoring agent has been configured and the data store is located on a NetApp or IBM Series N storage device.

#### **Topology**

This view is a link to topology workspaces that have this data store as a node. The status of the data store is depicted by the icon.

### **Datastore Detail - VMFS workspace**

This workspace contains views that are specific to one data store. The metrics in the workspace are the detailed metrics of the data store. The metrics include metrics that are configuration settings and metrics that represent a snapshot of some key performance metrics.

This workspace contains the following views:



**Utilization**

This view displays graphically the usage percentage of this data store.

**Connections**

This view shows the dependencies of other virtualization components on this data store.

**Percent Used - History**

This view shows percentage used of this data store over time. The time period is configurable. This data helps identify trends and spikes that occur at various points in time. Historical collection must be enabled for this view to populate.

**Datastore Detail**

This view contains the detailed configuration specifications of this data store and additional usage metrics.

**Topology**

This view is a link to topology workspaces that have this data store as a node. The status of the data store is depicted by the icon.

**Datastores workspace**

This workspace contains a list of all the data stores. This list might be used to identify problems with the data store. More detailed information about a specific data store can be obtained by using the link next to a row describing a data store.

This workspace contains the following views:

**Datastore Health**

This view shows all the data stores and basic health indicators for each one. In addition, information regarding how many other components are connected to the data store is shown. This information is helpful in providing insight about the impact of performance problems that the data store might be experiencing.

**NAS Datastores**

This view is specific to all data stores that are not of the VMFS type. This view is typically data stores backed by network-attached devices and defined on NFS or CIFS volumes. The link on each row enables navigation to a more detailed workspace specific to that data store.

**VMFS Datastores**

This view is specific to all data stores that are of the VMFS type. Data stores of type VMFS can be local to an ESX host or attached through a SAN device. The link on each row enables navigation to a more detailed workspace specific to that data store.

**Datastore Clusters**

This view shows all the data store clusters. The link in each row enables the navigation to a workspace that is specific to the data store cluster.

**Topology - Datastore workspace**

This workspace shows the relationship between data stores and ESX servers and clusters.

This workspace contains the following view:

**Topology**

This view displays graphically the logical connections of the data stores to ESX servers and clusters. The status of each entity is also depicted by each icon.

**Virtual Machines Topology workspace**

This workspace shows the relationship between virtual machines and other entities in the virtual enterprise such as data stores and clusters.

This workspace contains the following view:

**Topology**

This view displays graphically the logical connections of the virtual machines to ESX servers, data stores, and clusters. The status of each entity is also depicted by each icon.

**VM Datastore Utilization workspace**

This workspace contains views that are specific to one data store. These metrics provide insight about which virtual machines are allocated to this data store.

This workspace contains the following views:

### **VM Datastore Utilization**

This view displays metrics that illustrate which virtual machines are allocated on this data store. These metrics show how much space the virtual machine is currently using and how much space the virtual machine is allowed to use as it grows.

### **VM IO Operations**

This view displays the amount of data being read and written by the virtual machines on this datastore. These metrics show how busy the datastore is by virtual machine.

### **VM Datastore Provisioned Space**

This view shows graphically how much of the total provisioned space that is given to the virtual machine is actually being used.

### **Total IO by VM**

This view shows graphically how total data from both read and write operations is being done by each virtual machine.

### **VM Orphaned Disk workspace**

This workspace displays details about the orphaned virtual machine disk.

This workspace contains the following view:

#### **VM Orphaned Disk**

This view shows the details about the space that is used by an orphaned virtual machine disk on the data store. In addition, this view shows the date and time when an orphaned virtual machine disk was last modified.

## **Events Navigator item**

The workspace descriptions are organized by the Navigator item to which the workspaces are relevant.

### **Events workspace**

This workspace contains a list of events that have occurred while the monitoring agent is running. The events that are listed are not specific to an ESX server, but they are specific to a configured data source.

This workspace contains the following views:

#### **Virtual Center Events**

This view contains a list of the events specific to the data source.

#### **Triggered Alarms**

This view contains a list of the alarms that are triggered by VMWare for various monitored entities such as data stores and ESX hosts.

#### **Virtual Center Tasks**

This view contains a list of the tasks that are triggered on the vCenter server, and the tasks that are completed or failed for various monitored entities, such as data stores and the ESX hosts.

#### **Virtual Center Active Tasks**

This view contains a list of the active tasks that are triggered on the vCenter server for various monitored entities, such as data stores and the ESX hosts.

### **Triggered Alarms workspace**

This workspace contains a view that lists the alarms for a specific entity in order to be able to quickly identify the alarms that influence the alarms that have triggered on that object.

This workspace contains the following view:

#### **Triggered Alarms**

This view contains a list of the alarms that are triggered by VMWare for various monitored entities such as data stores and ESX hosts.

## **Monitored Servers Navigator item**

The workspace descriptions are organized by the Navigator item to which the workspaces are relevant.

### **Monitored Servers workspace**

This workspace contains a list of the monitored ESX servers.

This workspace contains the following views:

### **Monitored Servers**

This view contains a list of the monitored ESX servers. Monitored servers are discovered from the agent data source, which can be a VMware Virtual Center or an ESX server. Each entry in this view contains a link that provides navigation to the ESX Servers and IBM Systems Director workspaces. The IBM Systems Director workspaces require that an IBM Systems Director Server has been configured for the agent and shows the ESX Server in the IBM System Director Web UI.

### **Data Sources**

This view provides status information about the data sources that the agent uses to collect monitoring data.

### **Agent Events**

This view provides status information about the agent that is helpful if there is a configuration issue or if there is a problem connecting to a vCenter or ESX server.

### **Topology - Monitored Servers workspace**

This workspace provides insight into the logical connections between the major entities in the virtual enterprise.

This workspace contains the following view:

#### **Topology**

This view shows the relationship among virtual machines, ESX servers, clusters, resource pools, data centers, and the vCenter.

### **Virtual Machines - Monitored Servers workspace**

This workspace shows the relationship between virtual machines and other entities in the virtual enterprise such as ESX servers and clusters.

This workspace contains the following view:

#### **Topology**

This view displays graphically the logical connections of the virtual machines to ESX servers, and clusters. The status of each entity is also depicted by each icon.

## **Networks Navigator item**

The workspace descriptions are organized by the Navigator item to which the workspaces are relevant.

### **Distributed Network Detail workspace**

This workspace provides detail of a selected network in the infrastructure.

This workspace contains the following views:

#### **Network - Network\_Name**

This view displays the selected network status and configuration. A link is provided to view the triggered alarms by network.

#### **Networked Virtual Machines - Network\_Name**

This view shows the networked Virtual Machines usage.

#### **Networked Servers - Network\_Name**

This view shows the networked servers usage.

#### **Distributed Virtual Switches - Switch\_Name**

This view shows the Distributed virtual switches usage.

### **Distributed Virtual Switch Detail workspace**

This workspace provides detail of a selected Distributed Virtual switch in the infrastructure.

This workspace contains the following views:

#### **Distributed Virtual Switch - Switch\_Name**

This view displays the selected Distributed Virtual switch in the virtual infrastructure.

#### **Distributed Virtual Uplinks - Switch\_Name**

This view displays all the distributed virtual uplinks that are associated with the selected Distributed Virtual switch.

#### **Distributed Virtual Portgroups - Switch\_Name**

This view displays all the distributed virtual port groups that are associated with the selected Distributed Virtual switch.

#### **DVS Host Member Health - Switch\_Name**

This view displays health status of all the host associated with the selected Distributed Virtual switch.

#### **Network Detail workspace**

This workspace provides detail of a selected network in the infrastructure.

This workspace contains the following views:

##### **Network - Network\_Name**

This view displays the selected network status and configuration. A link is provided to view the triggered alarms by network.

##### **Networked Virtual Machines - Network\_Name**

This view shows the networked Virtual Machines usage.

##### **Networked Servers - Network\_Name**

This view shows the networked servers usage.

##### **Networked Virtual Switches - Network\_Name**

This view shows the networked virtual switches usage.

#### **Network NIC Detail workspace**

This workspace provides detail information about Network NIC in the infrastructure.

This workspace contains the following views:

##### **Networked Virtual Machines - Switch\_Name**

This view displays the Networked Virtual Machines that are associated with the selected switch.

##### **Distributed Virtual Uplinks - Switch\_Name - Host\_Name**

This view displays all the distributed virtual uplinks that are associated with the selected Distributed Virtual switch.

##### **Distributed Virtual Uplinks - Switch\_Name - Portgroup\_Name**

This view displays all the distributed virtual port groups that are associated with the selected Distributed Virtual switch.

#### **Networks workspace**

This workspace displays a summary of all the networks that are configured within the data centers.

This workspace contains the following views:

##### **Networks**

This view displays all of the configured networks by data center and provides a summary of the health of the network. A link is provided to view the triggered alarms by network.

##### **Standard Virtual Switches**

This view displays all of the virtual standard switches in the virtual infrastructure.

##### **Distributed Virtual Switches**

This view displays all of the Distributed Virtual switches in the virtual infrastructure.

## **VMware VI subnode**

The predefined workspace descriptions for the subnode are organized by the Navigator item to which the workspaces are relevant.

### **VMware VI Navigator item**

#### **VMware VI workspace**

This workspace provides views that show performance indicators for a single ESX server or host.

This workspace contains the following views:

##### **Server CPU Utilization**

This view shows CPU usage of the server or host by individual CPU.

##### **Server Memory Utilization**

This view shows the overall memory usage of the server.

### **Server Network**

This view shows the network performance of the server by network interface.

### **All Orphaned Virtual Machines workspace**

This workspace shows details about all the orphaned virtual machines.

This workspace contains the following view:

#### **All Orphaned Virtual Machines**

This view contains a list of the orphaned virtual machines of virtual environment.

### **All Virtual Machines workspace**

This workspace shows the details of all the virtual machines.

This workspace contains the following views:

#### **Virtual Machines**

This view shows the details about status of the virtual machines. In addition, this view contains a list of the virtual machines.

#### **Virtual Machines by CPU**

This view contains a list of the virtual machines that are categorized by CPU.

#### **Virtual Machines by Memory**

This view contains a list of the virtual machines that are categorized by memory.

## **CPU Navigator item**

### **CPU workspace**

This workspace provides views of the CPU usage of the ESX server.

This workspace contains the following views:

#### **Virtual Machine CPU**

This view shows the CPU usage of the virtual machines on this ESX server that are powered on.

#### **Utilization by Virtual Machine Name - CPU%**

This view shows the CPU usage of each virtual machine, by CPU, that is powered on.

#### **Percent Ready by Virtual Machine Name - CPU**

This view shows the CPU Percent Ready attribute for each virtual machine that is powered on. Ideally, this value is low.

#### **Server CPU Percent Usage**

This view shows the CPU usage of the ESX server.

#### **CPU Percent Use Per VM**

This view shows the CPU usage of the Virtual Machine.

## **Disk Navigator item**

### **Disk workspace**

This workspace provides views of the disk usage of the ESX server.

This workspace contains the following views:

#### **Server Disk**

This view shows the ESX server disk usage.

#### **Virtual Machine Partitions**

This view shows the disk partitions within the virtual machines. Partition information is available only if the virtual machine has the VMware Tools package installed and running.

#### **Virtual Machine Disks**

This view shows the virtual disks defined for the virtual machine.

#### **Virtual Machine Disks Performance**

This view shows information about the performance of disks that are associated with the virtual machines.

### **Server Disk Detail workspace**

This workspace contains views that are specific to one ESX host. The metrics are for disks from the ESX host point of view. This data includes local disks and data stores visible to this host.

This workspace contains the following views:

**Server Disk IO**

This graphical view displays metrics for each disk. The metrics show the number of read and write operations on the disk. The metrics command and commands aborted show how well the disk is servicing the requests.

**Server Disk Total Latencies**

This graphical view displays the total latency values of the disk requests categorized into device, kernel and queue.

**Server Disk Details**

This view shows a summary of the performance metrics for this disk.

**Server Disk Average Latencies**

This graphical view displays the average latency metrics for the server disk introduced by the device, kernel and queue.

**Server Disk Performance workspace**

This workspace contains views that are specific to one ESX host. The metrics are for disks from the ESX host point of view. This data includes local disks and data stores that are visible to this host.

This workspace contains the following views:

**Virtual Machine Disks**

This view shows the virtual hard disk drives that are configured for the virtual machines that are running on this host.

**Server Disk**

This view shows performance metrics for the disks defined to this host. This data includes local disks and data stores. These metrics give an idea of the demand on the disk and how well the disk is servicing the requests.

**Server SAN**

This view shows configuration information about SAN-attached disks on the ESX host.

## **ESX Server Navigator item**

### **Agent Health workspace**

This workspace contains a list of the VMware data stores.

This workspace contains the following view:

**VMWare VI Agent Status**

This view contains a list of the status of the agent data collection operations for the attribute groups.

### **ESX Server workspace**

This workspace provides views that describe the overall operating state of an ESX server. Links that enable quick navigation to other workspaces have been provided in this workspace. To fully take advantage of this feature, the Monitoring Agent for Linux must be installed on the ESX server.

This workspace contains the following views:

**Server Summary**

This partial view of the ESX server shows the server status and basic information.

**Server Parameters**

This partial view of the ESX server shows the server status and basic resource consumption.

**Events**

This view contains a list of events that have recently occurred. VMware alarms and events pertaining to this server are displayed here.

**Overall CPU Utilization**

This view shows the overall CPU usage of this server. The areas in color represent usage ranges that are noteworthy.

### **Overall Memory Utilization**

This view shows the overall memory usage of this server.

### **Server DataStore workspace**

This workspace contains a list of the VMware data stores.

This workspace contains the following views:

#### **Server DataStore**

This view contains a list of the data stores that this server is configured to use.

#### **Server DataStore Usage**

This view contains a list of the usage information for each data store.

#### **Server HBAs**

This view contains the Host Bus Adaptors for the ESX server.

### **Server Health workspace**

This workspace contains a list of all hardware sensors.

This workspace contains the following view:

#### **Sensors**

This view contains a list of all hardware sensors, their status, and their value.

## **Memory Navigator item**

### **Memory workspace**

This workspace provides views of the memory usage of the ESX server.

This workspace contains the following views:

#### **Server Memory**

This view shows the memory usage of the ESX server.

#### **Virtual Machine Memory**

This view shows the memory usage and configuration settings for the virtual machines configured on this ESX server.

#### **Guest Memory Utilization**

This view depicts the amount of memory used by the virtual machine guest operating system.

## **Network Navigator item**

### **Network workspace**

This workspace provides views of the network usage of the ESX server.

This workspace contains the following views:

#### **Server Network**

This view shows the network usage of the ESX server.

#### **Virtual Machine Network**

This view shows the network usage of the virtual machines on this ESX server.

#### **Server Virtual Switches**

This view shows the virtual switches on this ESX server.

## **Resource Pools Navigator item**

### **Resource Pools workspace**

This workspace provides views of the resource pools that are known to the ESX server.

This workspace contains the following views:

#### **Resource Pools**

This view shows the general metrics for the resource pools.

#### **Resource Pool CPU**

This view shows the CPU metrics for the resource pools.

#### **Resource Pool Memory**

This view shows the memory metrics for the resource pools.



## **Virtual Machines Navigator item**

### **Virtual Machines workspace**

This workspace provides views of the virtual machines that are defined on this ESX server.

This workspace contains the following views:

#### **Virtual Machines Configuration**

This view shows the properties given to virtual machines at the time they were created.

#### **Virtual Machines Status**

This view shows some of the runtime metrics for the virtual machines. If the VMware Tools package is not running on the virtual machine or the virtual machine is powered off, then several metrics are not known.

#### **Virtual Machines Snapshots**

This view shows information about the snapshots for the virtual machines.



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## Chapter 4. Attributes reference

Attributes are the application properties that are being measured and reported by the IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI.

### About attributes

Attributes are organized into attribute groups. Attributes in an attribute group relate to a single object such as an application, or to a single kind of data such as status information.

Attributes in a group can be used in queries, query-based views, situations, policy workflows, take action definitions, and launch application definitions. Chart or table views and situations are two examples of how attributes in a group can be used:

- Chart or table views

Attributes are displayed in chart and table views. The chart and table views use queries to specify which attribute values to request from a monitoring agent. You use the Properties editor to apply filters and set styles to define the content and appearance of a view based on an existing query.

- Situations

You use attributes to create situations that monitor the state of your operating system, database, or application. A situation describes a condition you want to test. When you start a situation, the values you assign to the situation attributes are compared with the values collected by the VMware VI agent and registers an *event* if the condition is met. You are alerted to events by indicator icons that are displayed in the Navigator.

### Additional information about attributes

For more information about using attributes and attribute groups, see the *Tivoli Enterprise Portal User's Guide*.

For a list of the attribute groups, a list of the attributes in each attribute group, and descriptions of the attributes for this monitoring agent, see “Attribute groups for the monitoring agent” and “Attributes in each attribute group” on page 37.

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### Attribute groups for the monitoring agent

The VMware VI agent contains the following attribute groups. The table name depends on the maximum table name limits of the target database being used for the Tivoli Data Warehouse. If the maximum name is 30 characters, any warehouse table name longer than 30 characters is shortened to 30 characters.

- Attribute group name: Active Tasks
  - Table name: KVMATASKS
  - Warehouse table name: KVM\_ACTIVE\_TASKS or KVMATASKS
- Attribute group name: Agent Events
  - Table name: KVMAEVENTS
  - Warehouse table name: KVM\_AGENT\_EVENTS or KVMAEVENTS
- Attribute group name: Cluster DRS Faults
  - Table name: KVMCLTDRSF
  - Warehouse table name: KVM\_CLUSTER\_DRS\_FAULTS or KVMCLTDRSF
- Attribute group name: Clustered Datastores
  - Table name: KVMCLTRDST

- Warehouse table name: KVM\_CLUSTERED\_DATASTORES or KVMCLTRDST
- Attribute group name: Clustered Resource Pools
  - Table name: KVMCLTRRPS
  - Warehouse table name: KVM\_CLUSTERED\_RESOURCE\_POOLS or KVMCLTRRPS
- Attribute group name: Clustered Servers
  - Table name: KVMCLTRSRV
  - Warehouse table name: KVM\_CLUSTERED\_SERVERS or KVMCLTRSRV
- Attribute group name: Clustered Virtual Apps
  - Table name: KVMCLTVAPS
  - Warehouse table name: KVM\_CLUSTERED\_VIRTUAL\_APPS or KVMCLTVAPS
- Attribute group name: Clustered Virtual Machines
  - Table name: KVMCLTRVMS
  - Warehouse table name: KVM\_CLUSTERED\_VIRTUAL\_MACHINES or KVMCLTRVMS
- Attribute group name: Clusters
  - Table name: KVMCLUSTRT
  - Warehouse table name: KVM\_CLUSTERS or KVMCLUSTRT
- Attribute group name: Datacenters
  - Table name: KVMDCTRS
  - Warehouse table name: KVM\_DATACENTERS or KVMDCTRS
- Attribute group name: Datastore Cluster
  - Table name: KVMDRCLUST
  - Warehouse table name: KVM\_DATASTORE\_CLUSTER or KVMDRCLUST
- Attribute group name: Datastore Host Disks
  - Table name: KVMDSHSD
  - Warehouse table name: KVM\_DATASTORE\_HOST\_DISKS or KVMDSHSD
- Attribute group name: Datastore Topology
  - Table name: KVMSTOPO
  - Warehouse table name: KVM\_DATASTORE\_TOPOLOGY or KVMSTOPO
- Attribute group name: Datastores
  - Table name: KVMDSTORES
  - Warehouse table name: KVM\_DATASTORES or KVMDSTORES
- Attribute group name: Director
  - Table name: KVMDIRE
  - Warehouse table name: KVM\_DIRECTOR or KVMDIRE
- Attribute group name: Distributed Virtual Portgroups
  - Table name: KVMDVPGRPS
  - Warehouse table name: KVM\_DISTRIBUTED\_VIRTUAL\_PORTGROUPS or KVMDVPGRPS
- Attribute group name: Distributed Virtual Switch Health
  - Table name: KVMDVSHLTH
  - Warehouse table name: KVM\_DISTRIBUTED\_VIRTUAL\_SWITCH\_HEALTH or KVMDVSHLTH
- Attribute group name: Distributed Virtual Switches
  - Table name: KVMDVSWTCH
  - Warehouse table name: KVM\_DISTRIBUTED\_VIRTUAL\_SWITCHES or KVMDVSWTCH
- Attribute group name: Distributed Virtual Uplinks
  - Table name: KVMDVUPLNK

- Warehouse table name: KVM\_DISTRIBUTED\_VIRTUAL\_UPLINKS or KVMDVUPLNK
- Attribute group name: ESX Performance Object Status
  - Table name: KVMESXPOS
  - Warehouse table name: KVM\_ESX\_PERFORMANCE\_OBJECT\_STATUS or KVMESXPOS
- Attribute group name: Events
  - Table name: KVMIRAEVNT
  - Warehouse table name: KVM\_EVENTS or KVMIRAEVNT
- Attribute group name: Monitored Servers
  - Table name: KVMDAG
  - Warehouse table name: KVM\_MONITORED\_SERVERS or KVMDAG
- Attribute group name: Networked Servers
  - Table name: KVMNETSERV
  - Warehouse table name: KVM\_NETWORKED\_SERVERS or KVMNETSERV
- Attribute group name: Networked Virtual Machines
  - Table name: KVMNETVM
  - Warehouse table name: KVM\_NETWORKED\_VIRTUAL\_MACHINES or KVMNETVM
- Attribute group name: Networked Virtual Switches
  - Table name: KVMNVSWITC
  - Warehouse table name: KVM\_NETWORKED\_VIRTUAL\_SWITCHES or KVMNVSWITC
- Attribute group name: Networks
  - Table name: KVMDCNETS
  - Warehouse table name: KVM\_NETWORKS or KVMDCNETS
- Attribute group name: Performance Object Status
  - Table name: KVMPOBJST
  - Warehouse table name: KVM\_PERFORMANCE\_OBJECT\_STATUS or KVMPOBJST
- Attribute group name: Resource Pool CPU
  - Table name: KVMRSPoolC
  - Warehouse table name: KVM\_RESOURCE\_POOL\_CPU or KVMRSPoolC
- Attribute group name: Resource Pool General
  - Table name: KVMRSPoolG
  - Warehouse table name: KVM\_RESOURCE\_POOL\_GENERAL or KVMRSPoolG
- Attribute group name: Resource Pool Memory
  - Table name: KVMRSPoolM
  - Warehouse table name: KVM\_RESOURCE\_POOL\_MEMORY or KVMRSPoolM
- Attribute group name: Server
  - Table name: KVMSERVERG
  - Warehouse table name: KVM\_SERVER or KVMSERVERG
- Attribute group name: Server CPU
  - Table name: KVMSERVERC
  - Warehouse table name: KVM\_SERVER\_CPU or KVMSERVERC
- Attribute group name: Server DataStore
  - Table name: KVMSEVRDS
  - Warehouse table name: KVM\_SERVER\_DATASTORE or KVMSEVRDS
- Attribute group name: Server Disk
  - Table name: KVMSEVRD

- Warehouse table name: KVM\_SERVER\_DISK or KVMSERVERD
- Attribute group name: Server HBA
  - Table name: KVMSRVHBAS
  - Warehouse table name: KVM\_SERVER\_HBA or KVMSRVHBAS
- Attribute group name: Server Health
  - Table name: KVMSVRHLTH
  - Warehouse table name: KVM\_SERVER\_HEALTH or KVMSVRHLTH
- Attribute group name: Server Memory
  - Table name: KVMSEVERM
  - Warehouse table name: KVM\_SERVER\_MEMORY or KVMSEVERM
- Attribute group name: Server Network
  - Table name: KVMSEVERN
  - Warehouse table name: KVM\_SERVER\_NETWORK or KVMSEVERN
- Attribute group name: Server SAN
  - Table name: KVMSRVRSAN
  - Warehouse table name: KVM\_SERVER\_SAN or KVMSRVRSAN
- Attribute group name: Server Virtual Switches
  - Table name: KVMSRVVSWI
  - Warehouse table name: KVM\_SERVER\_VIRTUAL\_SWITCHES or KVMSRVVSWI
- Attribute group name: Server VM Datastore Utilization
  - Table name: KVMSVMDSUT
  - Warehouse table name: KVM\_SERVER\_VM\_DATASTORE\_UTILIZATION or KVMSVMDSUT
- Attribute group name: SubNode Events
  - Table name: KVMSEVERE
  - Warehouse table name: KVM\_SUBNODE\_EVENTS or KVMSEVERE
- Attribute group name: Tasks
  - Table name: KVMTASKS
  - Warehouse table name: KVM\_TASKS
- Attribute group name: Thread Pool Status
  - Table name: KVMTHPLST
  - Warehouse table name: KVM\_THREAD\_POOL\_STATUS or KVMTHPLST
- Attribute group name: Topological Events
  - Table name: KVMTOPPEVNT
  - Warehouse table name: KVM\_TOPOLOGICAL\_EVENTS or KVMTOPPEVNT
- Attribute group name: Topology
  - Table name: KVMTPOPO
  - Warehouse table name: KVM\_TOPOLOGY or KVMTPOPO
- Attribute group name: Triggered Alarms
  - Table name: KVMALARMS
  - Warehouse table name: KVM\_TRIGGERED\_ALARMS or KVMALARMS
- Attribute group name: vCenters
  - Table name: KVMVCENTER
  - Warehouse table name: KVM\_VCENTERS or KVMVCENTER
- Attribute group name: Virtual Machines
  - Table name: KVMVM\_GEN

- Warehouse table name: KVM\_VIRTUAL\_MACHINES or KVMVM\_GEN
- Attribute group name: Virtual Switches
  - Table name: KVMVSWITCH
  - Warehouse table name: KVM\_VIRTUAL\_SWITCHES or KVMVSWITCH
- Attribute group name: VM CPU
  - Table name: KVMVM\_CPU
  - Warehouse table name: KVM\_VM\_CPU
- Attribute group name: VM Datastore Utilization
  - Table name: KVMVMDSUTL
  - Warehouse table name: KVM\_VM\_DATASTORE\_UTILIZATION or KVMVMDSUTL
- Attribute group name: VM Disk
  - Table name: KVMVM\_DISK
  - Warehouse table name: KVM\_VM\_DISK
- Attribute group name: VM Disk Performance
  - Table name: KVMVMDKPRF
  - Warehouse table name: KVM\_VM\_DISK\_PERFORMANCE or KVMVMDKPRF
- Attribute group name: VM Memory
  - Table name: KVMVM\_MEM
  - Warehouse table name: KVM\_VM\_MEMORY or KVMVM\_MEM
- Attribute group name: VM Network
  - Table name: KVMVM\_NET
  - Warehouse table name: KVM\_VM\_NETWORK or KVMVM\_NET
- Attribute group name: VM Orphaned Disk
  - Table name: KVMVMORPDI
  - Warehouse table name: KVM\_VM\_ORPHANED\_DISK or KVMVMORPDI
- Attribute group name: VM Partition
  - Table name: KVMVM\_PART
  - Warehouse table name: KVM\_VM\_PARTITION or KVMVM\_PART
- Attribute group name: VM Snapshot
  - Table name: KVMVMSNAP
- Attribute group name: VM SnapshotFileLayout
  - Table name: KVMVMSNPF
- Attribute group name: VM Snapshots
  - Table name: KVMVMSNAPS
  - Warehouse table name: KVM\_VM\_SNAPSHOTS or KVMVMSNAPS

---

## Attributes in each attribute group

Attributes in each VMware VI agent attribute group collect data that the agent uses for monitoring.

The descriptions of the attribute groups contain the following information:

### Historical group

Whether the attribute group is a historical type that you can roll off to a data warehouse.

### Attribute descriptions

Information such as description, type, source, and warehouse name, as applicable, for each attribute in the attribute group.

Some attributes are designated as key attributes. A *key attribute* is an attribute that is used in warehouse aggregation to identify rows of data that represent the same object.

The Source information sometimes uses C programming code syntax for if-then-else clauses to describe how an attribute is derived, for example:

```
(CPU_Pct < 0 ) || (Memory_Pct < 0 )? 0 : 1
```

This example means that if the CPU\_Pct attribute is less than 0 or if the Memory\_Pct attribute is less than 0, then the attribute is set to 0. Otherwise, the attribute is set to 1.

## Active Tasks attribute group

This attribute group provides information about the active tasks that are running on the vCenter server.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the Active Tasks attribute group:

**Node attribute: This attribute is a key attribute.**

#### Description

The managed system name of the agent.

#### Type

String

#### Source

The source for this attribute is the agent.

#### Warehouse name

NODE

### **Timestamp attribute**

#### Description

The local time at the agent when the data was collected.

#### Type

String

#### Source

The source for this attribute is the agent.

#### Warehouse name

TIMESTAMP

**Source Hostname attribute: This attribute is a key attribute.**

#### Description

The host name of the data source that created the task.

#### Type

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### Warehouse name

SOURCE\_HOSTNAME or SH

**Name attribute: This attribute is a key attribute.**

#### Description

The name of the task.

#### Type

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

	Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	NAME
<b><u>Target Entity attribute</u></b>	
<b>Description</b>	The name of the target managed entity for the task.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	TARGET_ENTITY or TE
<b><u>Status attribute</u></b>	
<b>Description</b>	The current status of the task. The valid values are queued and running.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	STATUS
<b><u>Initiated By attribute</u></b>	
<b>Description</b>	The type of the entity that created the task. The valid values are user name, another schedule task name, alarm name, and system.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	INITIATED_BY or IB
<b><u>Cancelable attribute</u></b>	
<b>Description</b>	Indicates whether cancellation of the task is supported.
<b>Type</b>	Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Yes (1)</li> <li>• No (0)</li> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
CANCELABLE	
<b>Queue Time attribute</b>	
<b>Description</b>	The date and time when the task was created.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
QUEUE_TIME	
<b>Start Time attribute</b>	
<b>Description</b>	The date and time when the task started running.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
START_TIME	
<b>Target Entity Type attribute</b>	
<b>Description</b>	The type of the target managed entity for the task.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
TARGET_ENTITY_TYPE or TET	

## Agent Events attribute group

This attribute group receives messages from the agent about agent status.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the Agent Events attribute group:

**Node attribute:** This attribute is a key attribute.

<b>Description</b>	The managed system name of the agent.
<b>Type</b>	String
<b>Source</b>	The source for this attribute is the agent.
<b>Warehouse name</b>	NODE



### Timestamp attribute

#### Description

The local time at the agent when the data was collected.

#### Type

String

#### Source

The source for this attribute is the agent.

#### Warehouse name

TIMESTAMP

### Source attribute

#### Description

The source of this agent event.

#### Type

String

#### Warehouse name

SOURCE

### Managed System attribute

#### Description

The managed system that is associated with this event.

#### Type

String

#### Warehouse name

MANAGED\_SYSTEM or MS

### Subsystem attribute

#### Description

The subsystem of the agent that generated this event.

#### Type

Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Permission (2)
- General (2)
- Task (1)
- Connection (0)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### Warehouse name

SUBSYSTEM

### Severity attribute

#### Description

The level of severity for this agent event.

#### Type

Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Severe (2)
- Warning (1)
- Info (0)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### Warehouse name

SEVERITY

### Message attribute

#### Description

The message of this event.

## Type

Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Server performance API unavailable. (23)
- Connection failed: Incorrect WSDL Version (22)
- Insufficient Permissions (21)
- Insufficient Permissions: Missing Datastore.Browse (20)
- Insufficient Permissions: Missing System.Read (19)
- Insufficient Permissions: Missing System.View (18)
- Insufficient Permissions: Missing VirtualMachine.Interact.PowerOff (17)
- Insufficient Permissions: Missing VirtualMachine.Interact.PowerOn (16)
- Initial Property Collection Complete (15)
- Connection failed: http redirected (14)
- Connection failed: unsupported server version (13)
- Agent Stopped (12)
- Agent Started (11)
- Connection failed: unknown failure (10)
- VM Power On Task Succeeded (9)
- VM Power On Task Failed (8)
- VM Power Off Task Succeeded (7)
- VM Power Off Task Failed (6)
- Connection reset (5)
- Connection succeeded (4)
- Connection failed: username or password invalid (3)
- Connection failed: ssl negotiation failed (2)
- Connection failed: connection refused (1)
- Connection failed: address not found (0)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

## Warehouse name

MESSAGE

## Cluster DRS Faults attribute group

This attribute group provides information about the Distributed Resource Scheduler (DRS) and Storage Distributed Resource Scheduler (SDRS) faults that are generated in the cluster.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the Cluster DRS Faults attribute group:

**Node attribute:** This attribute is a key attribute.

#### Description

The managed system name of the agent.

#### Type

String

#### Source

The source for this attribute is the agent.

#### Warehouse name

NODE

### Timestamp attribute

#### Description

The local time at the agent when the data was collected.

#### Type

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Source attribute:** This attribute is a key attribute.

**Description**

The host name of the data source.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SOURCE

**DataCenter attribute:** This attribute is a key attribute.

**Description**

The name of the data center that contains the cluster.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER

**Cluster attribute:** This attribute is a key attribute.

**Description**

The name of the cluster where the fault is generated.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CLUSTER

**Fault Name attribute**

**Description**

The name of the fault that is generated in the cluster.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

FAULT\_NAME

**Reason attribute**

**Description**

The code that explains why DRS attempted to set recommendations for entities (such as Rule enforcement, Power management, and so on) when faults were generated.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

REASON

**Fault Message attribute****Description**

The message that is displayed corresponding to the fault.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

FAULT\_MESSAGE or FM

**Source Hostname attribute****Description**

The name of the host system of a virtual machine. If this attribute value is Unavailable, the fault is not associated with a particular virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SOURCE\_HOSTNAME or SH

**Target Hostname attribute****Description**

The name of the target host system that is selected for the migration of virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TARGET\_HOSTNAME or TH

**Virtual Machine attribute**

**Description**

The name of the virtual machine that the DRS was trying to move when the fault was generated. If this attribute value is Unavailable, the fault is not associated with a particular virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VIRTUAL\_MACHINE or VM

**FT Virtual Machine attribute****Description**

The name of the fault tolerance virtual machine. If this attribute value is Unavailable, the fault is not associated with a particular virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

FT\_VIRTUAL\_MACHINE or FVM

**DRS Type attribute****Description**

The type of DRS. The valid values are DRS and SDRS.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DRS\_TYPE

## Clustered Datastores attribute group

This attribute group describes the data stores that are used by a cluster.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Clustered Datastores attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

<b>Warehouse name</b>	
NODE	
<b><u>Timestamp attribute</u></b>	
<b>Description</b>	The local time at the agent when the data was collected.
<b>Type</b>	String
<b>Source</b>	The source for this attribute is the agent.
<b>Warehouse name</b>	
TIMESTAMP	
<b><u>Datacenter attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The name of the data center that contains the cluster.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
DATACENTER	
<b><u>Cluster attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The name of the cluster.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
CLUSTER	
<b><u>Datastore attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The name of the data store.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
DATASTORE	
<b><u>Overall Status attribute</u></b>	
<b>Description</b>	The overall status for this data store.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

	<ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	OVERALL_STATUS or OS
<b><u>Accessible attribute</u></b>	
<b>Description</b>	Whether the data store is accessible or not.
<b>Type</b>	<p>Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Yes (1)</li> <li>• No (0)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	ACCESSIBLE
<b><u>Capacity attribute</u></b>	
<b>Description</b>	The storage capacity in MB of the data store.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	CAPACITY
<b><u>Percent Used attribute</u></b>	
<b>Description</b>	The percentage of used space in the data store.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	PERCENT_USED or PU
<b><u>Type attribute</u></b>	
<b>Description</b>	The type for the data store.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>

<b>Warehouse name</b>	
TYPE	
<b><u>Remote Host Address attribute</u></b>	
<b>Description</b>	The remote host address for the data store.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
REMOTE_HOST_ADDRESS or RHA	
<b><u>Remote Path attribute</u></b>	
<b>Description</b>	The remote path for the data store.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
REMOTE_PATH or RP	
<b><u>Managed System Name attribute</u></b>	
<b>Description</b>	The managed system name of the storage monitoring agent that is associated with the data.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
MSN	
<b><u>NodeID attribute</u></b>	
<b>Description</b>	This attribute is only for IBM-internal use.
<b>Type</b>	String
<b>Warehouse name</b>	
NODEID	
<b><u>Connected Hosts attribute</u></b>	
<b>Description</b>	The number of hosts that are connected to the data store.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul>



Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CONNECTED\_HOSTS or CH

**Connected VMs attribute**

**Description**

The number of virtual machines that are connected to the data store.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CONNECTED\_VMS or CV

**Include Data In Summarization 0 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Capacity < 0 ) || (Percent\_Used < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

## Clustered Resource Pools attribute group

This attribute group describes the resource pools that are members of a cluster.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Clustered Resource Pools attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

<b>Type</b>	String
<b>Source</b>	The source for this attribute is the agent.
<b>Warehouse name</b>	TIMESTAMP
<b><u>DataCenter attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The name of the data center that contains the cluster.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	DATACENTER
<b><u>Cluster Name attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The name of the cluster.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	CLUSTER_NAME or CN
<b><u>Pool Name attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The name of this resource pool.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	POOL_NAME
<b><u>Max CPU Usage attribute</u></b>	
<b>Description</b>	The current upper bound on CPU usage in MHz. This limit is based on the limit that is configured for the resource pool and the limits that are configured for all parent resource pools.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
MAX_CPU_USAGE or MCU	
<b>CPU Usage attribute</b>	
<b>Description</b>	The CPU usage in MHz of all running child virtual machines including virtual machines in child resource pools.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
CPU_USAGE	
<b>Max Memory Usage attribute</b>	
<b>Description</b>	The current upper bound on memory usage in MB. This limit is based on the limit configured for this resource pool and the limits configured for all parent resource pools.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
MAX_MEMORY_USAGE or MMU	
<b>Memory Usage attribute</b>	
<b>Description</b>	The memory usage in MB of all running child virtual machines including virtual machines in child resource pools.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
MEMORY_USAGE or MU	
<b>Percent CPU Usage attribute</b>	
<b>Description</b>	The percentage of CPU resources being used relative to the maximum amount currently available to this resource pool.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>

<b>Warehouse name</b>	
PERCENT_CPU_USAGE or PCU	
<b><u>Percent Memory Usage attribute</u></b>	
<b>Description</b>	The percentage of memory resources being used relative to the maximum amount currently available to this resource pool.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
PERCENT_MEMORY_USAGE or PMU	
<b><u>Overall Status attribute</u></b>	
<b>Description</b>	The overall status for this alarm.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
OVERALL_STATUS or OS	
<b><u>NodeID attribute</u></b>	
<b>Description</b>	This attribute is only for IBM-internal use.
<b>Type</b>	String
<b>Warehouse name</b>	
NODEID	
<b><u>NodeType attribute</u></b>	
<b>Description</b>	The type of node. The valid values are kvm.Resource_Pool and kvm.Virtual_App.
<b>Type</b>	String
<b>Warehouse name</b>	
NODETYPE	
<b><u>Include Data In Summarization 0 attribute</u></b>	
<b>Description</b>	This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Value Exceeds Maximum (2147483647)</li> <li>• Value Exceeds Minimum (-2147483648)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>

**Source**

The source for this attribute is derived: (Max\_CPU\_Usage < 0 ) || (Percent\_CPU\_Usage < 0 ) || (CPU\_Usage < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

**Include Data In Summarization 1 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Max\_Memory\_Usage < 0 ) || (Memory\_Usage < 0 ) || (Percent\_Memory\_Usage < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

## Clustered Servers attribute group

This attribute group describes the ESX servers that are members of a cluster.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Clustered Servers attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute****Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**DataCenter attribute: This attribute is a key attribute.**

**Description**

The name of the data center that contains the cluster.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise

Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER

**Cluster Name attribute:** This attribute is a key attribute.

**Description**

The name of the cluster.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CLUSTER\_NAME or CN

**Server Hostname attribute:** This attribute is a key attribute.

**Description**

The host name of the ESX server that is a member of this cluster.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVER\_HOSTNAME or SH

**Server CPU Utilization attribute**

**Description**

The overall CPU usage of this ESX server.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVER\_CPU\_UTILIZATION or SCU

**Server Memory Utilization attribute**

**Description**

The overall memory usage of this ESX server.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
SERVER_MEMORY_UTILIZATION or SMU	
<b><u>CPU Effective Contribution attribute</u></b>	
<b>Description</b>	The percentage of CPU resources that this server contributes to the effective CPU of the cluster.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
CPU_EFFECTIVE_CONTRIBUTION or CEC	
<b><u>CPU Total Contribution attribute</u></b>	
<b>Description</b>	The percentage of CPU resources that this server contributes to the total CPU of the cluster.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
CPU_TOTAL_CONTRIBUTION or CTC	
<b><u>CPU Effective Utilization attribute</u></b>	
<b>Description</b>	The CPU usage of this server as a percentage of the effective CPU resources that are owned by this cluster.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
CPU_EFFECTIVE_UTILIZATION or CEU	
<b><u>CPU Total Utilization attribute</u></b>	
<b>Description</b>	The CPU usage of this server as a percentage of the total CPU resources that are owned by this cluster.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
CPU_TOTAL_UTILIZATION or CTU	

### **Mem Effective Contribution attribute**

#### **Description**

The percentage of memory resources that this server contributes to the effective memory of the cluster.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

MEM\_EFFECTIVE\_CONTRIBUTION or MEC

### **Mem Total Contribution attribute**

#### **Description**

The percentage of memory resources that this server contributes to the total memory of the cluster.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

MEM\_TOTAL\_CONTRIBUTION or MTC

### **Memory Effective Utilization attribute**

#### **Description**

The memory usage of this server as a percentage of the effective memory resources that are owned by this cluster.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

MEMORY\_EFFECTIVE\_UTILIZATION or MEU

### **Memory Total Utilization attribute**

#### **Description**

The memory usage of this server as a percentage of the total memory resources that are owned by this cluster.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

MEMORY\_TOTAL\_UTILIZATION or MTU

### **MSN Name attribute**



**Description**

The managed system name that is associated with the data.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MSN\_NAME

**Overall Status attribute****Description**

The overall status for this alarm.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

OVERALL\_STATUS or OS

**NodeID attribute****Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

**Include Data In Summarization 0 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Server\_CPU\_Utilization < 0 ) || (CPU\_Total\_Utilization < 0 ) || (CPU\_Effective\_Utilization < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

**Include Data In Summarization 1 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**  
Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**  
The source for this attribute is derived: (Server\_Memory\_Utilization < 0 ) || (Memory\_Total\_Utilization < 0 ) || (Memory\_Effective\_Utilization < 0 )? 0 : 1.

**Warehouse name**  
INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

#### **Include Data In Summarization 2 attribute**

**Description**  
This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**  
Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**  
The source for this attribute is derived: (CPU\_Effective\_Contribution < 0 ) || (CPU\_Total\_Contribution < 0 ) || (Mem\_Effective\_Contribution < 0 ) || (Mem\_Total\_Contribution < 0 )? 0 : 1.

**Warehouse name**  
INCLUDE\_DATA\_IN\_SUMMARIZATION\_2 or IDIS2

## **Clustered Virtual Apps attribute group**

This attribute group provides information about the virtual machines and virtual applications in the cluster.

### **Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

### **Attribute descriptions**

The following list contains information about each attribute in the Clustered Virtual Apps attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**  
The managed system name of the agent.

**Type**  
String

**Source**  
The source for this attribute is the agent.

**Warehouse name**  
NODE

### **Timestamp attribute**

**Description**  
The local time at the agent when the data was collected.

<b>Type</b>	String
<b>Source</b>	The source for this attribute is the agent.
<b>Warehouse name</b>	TIMESTAMP
<b><u>Datacenter attribute:</u> This attribute is a key attribute.</b>	
<b>Description</b>	The name of the data center that contains the cluster.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	DATACENTER
<b><u>Cluster Name attribute:</u> This attribute is a key attribute.</b>	
<b>Description</b>	The name of the cluster.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	CLUSTER_NAME or CN
<b><u>Virtual App Name attribute:</u> This attribute is a key attribute.</b>	
<b>Description</b>	The name of the virtual application.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	VIRTUAL_APP_NAME or VAN
<b><u>Virtual Machine Name attribute</u></b>	
<b>Description</b>	The name of the virtual machine.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	VIRTUAL_MACHINE_NAME or VMN

### **Destroy With Parent attribute**

#### **Description**

Indicates whether the virtual machine must be removed when the virtual application that is associated with the virtual machine is removed.

#### **Type**

Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Yes (1)
- No (0)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

DESTROY\_WITH\_PARENT or DWP

### **Waiting for Guest attribute**

#### **Description**

Indicates whether the virtual machine must start after receiving a heartbeat from the guest operating system.

#### **Type**

Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Yes (1)
- No (0)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

WAITING\_FOR\_GUEST or WFG

### **Start Action attribute**

#### **Description**

Indicates the method by which the virtual machine starts. The valid values are none and powerOn.

#### **Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

START\_ACTION or SA

### **Stop Action attribute**

#### **Description**

Indicates the method by which the virtual machine stops. The valid values are none, powerOff, guestShutdown, and suspend.

#### **Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

STOP\_ACTION or SA0

**Start Delay attribute****Description**

The amount of time (in seconds) that the subsequent virtual machine was delayed to start in a sequence of virtual machines.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

START\_DELAY or SD

**Stop Delay attribute****Description**

The amount of time (in seconds) that the subsequent virtual machine was delayed to stop in a sequence of virtual machines.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

STOP\_DELAY

**Start Order attribute****Description**

Indicates the order in which the virtual machine starts.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

START\_ORDER or SO

**VM MOREf attribute****Description**

The internal managed object reference name of the virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MOREF

**NodeID attribute****Description**

This attribute is only for IBM-internal use.

Type  
String  
Warehouse name  
NODEID

## Clustered Virtual Machines attribute group

This attribute group describes the virtual machines that are members of a cluster.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the Clustered Virtual Machines attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**  
The managed system name of the agent.

**Type**  
String

**Source**  
The source for this attribute is the agent.

**Warehouse name**  
NODE

### **Timestamp attribute**

**Description**  
The local time at the agent when the data was collected.

**Type**  
String

**Source**  
The source for this attribute is the agent.

**Warehouse name**  
TIMESTAMP

**DataCenter attribute: This attribute is a key attribute.**

**Description**  
The name of the data center that contains the cluster.

**Type**  
String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
DATACENTER

**Cluster Name attribute: This attribute is a key attribute.**

**Description**  
The name of the cluster.

**Type**  
String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
CLUSTER\_NAME or CN

**VM Name attribute:** This attribute is a key attribute.

**Description**

The user-defined display name of this virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_NAME

**CPU Utilization attribute**

**Description**

The overall CPU usage of this virtual machine during the collection interval.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_UTILIZATION or CU

**Memory Utilization attribute**

**Description**

The overall memory usage of this virtual machine during the collection interval.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MEMORY\_UTILIZATION or MU

**MSN Name attribute**

**Description**

The managed system name that is associated with the data.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MSN\_NAME

**Overall Status attribute**

**Description**

The overall status for this alarm.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise

Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

OVERALL\_STATUS or OS

**NodeID attribute**

**Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

**Include Data In Summarization 0 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived:  $(CPU\_Utilization < 0) \mid (Memory\_Utilization < 0) ? 0 : 1$ .

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

## Clusters attribute group

This attribute group contains metrics that describe the configuration and performance of a cluster.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the Clusters attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String



**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**DataCenter attribute: This attribute is a key attribute.**

**Description**

The name of the data center that contains the cluster.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER

**Cluster Name attribute: This attribute is a key attribute.**

**Description**

The name of the cluster.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CLUSTER\_NAME or CN

**DRS Enabled attribute**

**Description**

Indicates whether the VMware Dynamic Resource Scheduling facility is enabled for this cluster.

**Type**

Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Yes (1)
- No (0)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DRS\_ENABLED or DE

**HA Enabled attribute**

**Description**

Indicates whether the VMware High Availability feature is enabled for this cluster.

**Type**

Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Yes (1)
- No (0)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
HA_ENABLED	
<b><u>Number Servers attribute</u></b>	
<b>Description</b>	The number of ESX servers that are members of this cluster.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
NUMBER_SERVERS or NS	
<b><u>Effective Servers attribute</u></b>	
<b>Description</b>	The number of ESX servers that are available to run virtual machines. Hosts that are unresponsive or in VMware maintenance mode are not counted.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
EFFECTIVE_SERVERS or ES	
<b><u>Number CPUs attribute</u></b>	
<b>Description</b>	The number of physical CPU cores across the cluster.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
NUMBER_CPUS or NC	
<b><u>Total Memory attribute</u></b>	
<b>Description</b>	The total memory capacity in GB over all of the member servers in the cluster.
<b>Type</b>	<p>Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
TOTAL_MEMORY or TM	
<b><u>Effective Memory attribute</u></b>	

<b>Description</b>	
The amount of memory in GB that is available to run virtual machines.	
<b>Type</b>	<p>Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
EFFECTIVE_MEMORY or EM	
<b><u>Total CPU attribute</u></b>	
<b>Description</b>	
The total amount of CPU resources in GHz over all of the member servers in the cluster.	
<b>Type</b>	<p>Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
TOTAL_CPU	
<b><u>Effective CPU attribute</u></b>	
<b>Description</b>	
The amount of CPU in GHz that is available to run virtual machines. This is an aggregation from all servers that are running normally. The amount of CPU used by the service consoles on each server is not included in the total.	
<b>Type</b>	<p>Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
EFFECTIVE_CPU or EC	
<b><u>Number vMotions attribute</u></b>	
<b>Description</b>	
The total number of migrations that have occurred within this cluster.	
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
NUMBER_VMOTIONS or NV	
<b><u>Overall Status attribute</u></b>	

**Description**

The overall operational status of the cluster.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

OVERALL\_STATUS or OS

**CPU Utilization attribute****Description**

The total number of CPU resources being used by the member servers divided by the total CPU of the cluster, excluding any members in maintenance mode.

**Type**

Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_UTILIZATION or CU

**Memory Utilization attribute****Description**

The total amount of memory resources being used by the member servers divided by the total memory of the cluster, excluding any members in maintenance mode.

**Type**

Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MEMORY\_UTILIZATION or MU

**CPU 00 10 attribute****Description**

The number of servers in this cluster whose CPU usage is 0 - 10 percent.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_00\_10

**CPU 10 20 attribute**

**Description**

The number of servers in this cluster whose CPU usage is 11 - 20 percent.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_10\_20

**CPU 20 30 attribute****Description**

The number of servers in this cluster whose CPU usage is 21 - 30 percent.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_20\_30

**CPU 30 40 attribute****Description**

The number of servers in this cluster whose CPU usage is 31 - 40 percent.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_30\_40

**CPU 40 50 attribute****Description**

The number of servers in this cluster whose CPU usage is 41 - 50 percent.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_40\_50

**CPU 50 60 attribute****Description**

The number of servers in this cluster whose CPU usage is 51 - 60 percent.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_50\_60

#### **CPU 60 70 attribute**

##### **Description**

The number of servers in this cluster whose CPU usage is 61 - 70 percent.

##### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_60\_70

#### **CPU 70 80 attribute**

##### **Description**

The number of servers in this cluster whose CPU usage is 71 - 80 percent.

##### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_70\_80

#### **CPU 80 90 attribute**

##### **Description**

The number of servers in this cluster whose CPU usage is 81 - 90 percent.

##### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_80\_90

#### **CPU 90 100 attribute**

##### **Description**

The number of servers in this cluster whose CPU usage is 91 - 100 percent.

##### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_90\_100

### **Memory 00 10 attribute**

#### **Description**

The number of servers in this cluster whose memory usage is 0 - 10 percent.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

MEMORY\_00\_10 or M01

### **Memory 10 20 attribute**

#### **Description**

The number of servers in this cluster whose memory usage is 11 - 20 percent.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

MEMORY\_10\_20 or M12

### **Memory 20 30 attribute**

#### **Description**

The number of servers in this cluster whose memory usage is 21 - 30 percent.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

MEMORY\_20\_30 or M23

### **Memory 30 40 attribute**

#### **Description**

The number of servers in this cluster whose memory usage is 31 - 40 percent.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

MEMORY\_30\_40 or M34

### **Memory 40 50 attribute**

#### **Description**

The number of servers in this cluster whose memory usage is 41 - 50 percent.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the

Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MEMORY\_40\_50 or M45

**Memory 50 60 attribute**

**Description**

The number of servers in this cluster whose memory usage is 51 - 60 percent.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MEMORY\_50\_60 or M56

**Memory 60 70 attribute**

**Description**

The number of servers in this cluster whose memory usage is 61 - 70 percent.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MEMORY\_60\_70 or M67

**Memory 70 80 attribute**

**Description**

The number of servers in this cluster whose memory usage is 71 - 80 percent.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MEMORY\_70\_80 or M78

**Memory 80 90 attribute**

**Description**

The number of servers in this cluster whose memory usage is 81 - 90 percent.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.



<b>Warehouse name</b>	
MEMORY_80_90 or M89	
<b><u>Memory 90 100 attribute</u></b>	
<b>Description</b>	The number of servers in this cluster whose memory usage is 91 - 100 percent.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
MEMORY_90_100 or M91	
<b><u>Percent Effective Servers attribute</u></b>	
<b>Description</b>	The percentage of servers defined to the cluster that are available to run virtual machines.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
PERCENT_EFFECTIVE_SERVERS or PES	
<b><u>Percent Effective CPU attribute</u></b>	
<b>Description</b>	The percentage of CPU for the cluster that is available to run virtual machines.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
PERCENT_EFFECTIVE_CPU or PEC	
<b><u>Percent Effective Memory attribute</u></b>	
<b>Description</b>	The percentage of memory for the cluster that is available to run virtual machines.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
PERCENT_EFFECTIVE_MEMORY or PEM	
<b><u>Number VMs attribute</u></b>	

**Description**

The number of virtual machines that are configured within this cluster.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_VMS

**Number VMs On attribute****Description**

The number of virtual machines that are configured within this cluster that are powered on.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_VMS\_ON or NVO

**Datacenter MOREf attribute****Description**

The internal managed object reference name of the data center for this cluster.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER\_MOREF or DM

**Cluster MOREf attribute****Description**

The internal managed object reference name of this cluster.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CLUSTER\_MOREF or CM

**Datastores Total Space attribute****Description**

The total space of all data stores connected to this cluster in MB.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the

Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATASTORES\_TOTAL\_SPACE or DTS

**Datastores Total Free Space attribute**

**Description**

The total free space of all data stores connected to this cluster in MB.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATASTORES\_TOTAL\_FREE\_SPACE or DTFS

**NodeID attribute**

**Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

**Servers In Maintenance Mode attribute**

**Description**

The number of ESX servers that are in maintenance mode.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVERS\_IN\_MAINTENANCE\_MODE or SIMM

**Total VM Configured Memory attribute**

**Description**

The total amount of memory in GB configured for all VMs in the cluster.

**Type**

Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TOTAL\_VM\_CONFIGURED\_MEMORY or TVCM

**Total VM Provisioned Space attribute**

**Description**

The total amount of space in GB that is provisioned for use by VMs in this cluster.

**Type**

Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TOTAL\_VM\_PROVISIONED\_SPACE or TVPS

**Physical NICs attribute****Description**

The total number of physical network interface cards in the cluster.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PHYSICAL\_NICS or PN

**Physical NICs Down attribute****Description**

The total number of physical network interface cards in the cluster with a link status of down.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PHYSICAL\_NICS\_DOWN or PND

**Current EVC Mode attribute****Description**

The current Enhanced VMotion Compatibility (EVC) mode of the cluster.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CURRENT\_EVC\_MODE or CEM

**Include Data In Summarization 0 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Number\_Servers < 0 ) || (Number\_CPUs < 0 ) || (Effective\_Servers < 0 ) || (Percent\_Effective\_Servers < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

**Include Data In Summarization 1 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Total\_Memory < 0 ) || (Effective\_Memory < 0 ) || (Percent\_Effective\_Memory < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

**Include Data In Summarization 2 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Total\_CPU < 0 ) || (Effective\_CPU < 0 ) || (Percent\_Effective\_CPU < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_2 or IDIS2

### **Include Data In Summarization 3 attribute**

#### **Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Source**

The source for this attribute is derived:  $(CPU\_Utilization < 0) \vee (Memory\_Utilization < 0) ? 0 : 1$ .

#### **Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_3 or IDIS3

### **Include Data In Summarization 4 attribute**

#### **Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Source**

The source for this attribute is derived:  $(CPU\_00\_10 < 0) \vee (CPU\_10\_20 < 0) \vee (CPU\_20\_30 < 0) \vee (CPU\_30\_40 < 0) \vee (CPU\_40\_50 < 0) \vee (CPU\_50\_60 < 0) \vee (CPU\_60\_70 < 0) \vee (CPU\_70\_80 < 0) \vee (CPU\_80\_90 < 0) \vee (CPU\_90\_100 < 0) \vee (Memory\_00\_10 < 0) \vee (Memory\_10\_20 < 0) \vee (Memory\_20\_30 < 0) \vee (Memory\_30\_40 < 0) \vee (Memory\_40\_50 < 0) \vee (Memory\_50\_60 < 0) \vee (Memory\_60\_70 < 0) \vee (Memory\_70\_80 < 0) \vee (Memory\_80\_90 < 0) \vee (Memory\_90\_100 < 0) ? 0 : 1$ .

#### **Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_4 or IDIS4

### **Include Data In Summarization 5 attribute**

#### **Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Number\_VMs < 0 ) || (Number\_VMs\_On < 0 ) || (Number\_vMotions < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_5 or IDIS5

**Include Data In Summarization 6 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Datastores\_Total\_Space < 0 ) || (Datastores\_Total\_Free\_Space < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_6 or IDIS6

**Include Data In Summarization 7 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Physical\_NICs < 0 ) || (Physical\_NICs\_Down < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_7 or IDIS7

**Include Data In Summarization 8 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.



**Source**

The source for this attribute is derived: (Servers\_In\_Maintenance\_Mode < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_8 or IDIS8

**Include Data In Summarization 9 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Total\_VM\_Configured\_Memory < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_9 or IDIS9

**Include Data In Summarization 10 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Total\_VM\_Provisioned\_Space < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_10 or IDIS10

## Datcenters attribute group

This attribute group contains information about the data centers in the virtual infrastructure.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Datcenters attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.



<b>Warehouse name</b>	
NODE	
<b><u>Timestamp attribute</u></b>	
<b>Description</b>	The local time at the agent when the data was collected.
<b>Type</b>	String
<b>Source</b>	The source for this attribute is the agent.
<b>Warehouse name</b>	
TIMESTAMP	
<b><u>Datacenter attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The name of this data center.
<b>Type</b>	String
<b>Warehouse name</b>	
DATACENTER	
<b><u>Total Servers attribute</u></b>	
<b>Description</b>	The total numbers of servers that are members of this data center.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
TOTAL_SERVERS or TS	
<b><u>Effective Servers attribute</u></b>	
<b>Description</b>	The total number of effective servers that are members of this data center.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
EFFECTIVE_SERVERS or ES	
<b><u>Percent Effective Servers attribute</u></b>	
<b>Description</b>	The percent of servers that are effective for this data center.
<b>Type</b>	Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
PERCENT_EFFECTIVE_SERVERS or PES	
<b>Total Memory attribute</b>	
<b>Description</b>	The total amount of memory of this data center in MB.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
TOTAL_MEMORY or TM	
<b>Effective Memory attribute</b>	
<b>Description</b>	The total amount of effective memory of this data center in MB.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
EFFECTIVE_MEMORY or EM	
<b>Memory Utilization attribute</b>	
<b>Description</b>	The percent of available memory being used in this data center.
<b>Type</b>	<p>Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
MEMORY_UTILIZATION or MU	
<b>Total CPU attribute</b>	
<b>Description</b>	The total amount of CPU of this data center in MHz.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
TOTAL_CPU	
<b>Effective CPU attribute</b>	
<b>Description</b>	The total amount of effective CPU of this data center in MHz.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

EFFECTIVE\_CPU or EC

**CPU Utilization attribute****Description**

The percent of available CPU being used in this data center.

**Type**

Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_UTILIZATION or CU

**Overall Status attribute****Description**

The overall status for this alarm.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

OVERALL\_STATUS or OS

**NodeID attribute****Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

**Include Data In Summarization 0 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived:  $(\text{Total\_Servers} < 0) \parallel (\text{Effective\_Servers} < 0) \parallel (\text{Percent\_Effective\_Servers} < 0)? 0 : 1.$

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

**Include Data In Summarization 1 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived:  $(\text{Total\_Memory} < 0) \parallel (\text{Effective\_Memory} < 0)? 0 : 1.$

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

**Include Data In Summarization 2 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived:  $(\text{Total\_CPU} < 0) \parallel (\text{Effective\_CPU} < 0)? 0 : 1.$

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_2 or IDIS2

**Include Data In Summarization 3 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Memory\_Utilization < 0 ) || (CPU\_Utilization < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_3 or IDIS3

## Datastore Cluster attribute group

This attribute group contains attributes that provide information about the data store cluster (StoragePod).

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Datastore Cluster attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute****Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**DataCenter attribute: This attribute is a key attribute.**

**Description**

The name of the data center that the data store cluster belongs to.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER

**Datastore Cluster attribute: This attribute is a key attribute.**

**Description**

The name of the data store cluster.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
DATASTORE_CLUSTER or DC	
<b><u>Config Status attribute</u></b>	
<b>Description</b>	The configuration status of the data store cluster.If a problem is detected in the configuration of the data store cluster, the value is displayed as red; and if a problem is about to occur or a transient condition has occurred, the value is displayed as yellow.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
CONFIG_STATUS or CS	
<b><u>Overall Status attribute</u></b>	
<b>Description</b>	The overall alarm status of the data store cluster.If an alarm is triggered for the data store cluster, the value is displayed as red or yellow.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
OVERALL_STATUS or OS	
<b><u>Default IntraVm Affinity attribute</u></b>	
<b>Description</b>	Indicates whether, by default, each virtual machine must have a virtual disk on the same data store in the data store cluster. The valid values are True and False.
<b>Type</b>	Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• True (1)</li> <li>• False (0)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
DEFAULT_INTRAVM_AFFINITY or DIA	
<b><u>IO Load Balance Enabled attribute</u></b>	
<b>Description</b>	Indicates whether the data store cluster considers the Storage I/O workload while creating load balancing and initial placement recommendations.
<b>Type</b>	Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• True (1)</li> <li>• False (0)</li> </ul>

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

IO\_LOAD\_BALANCE\_ENABLED or ILBE

**Load Balance Interval attribute**

**Description**

The interval (in minutes) that the Storage Distributed Resource Scheduler (DRS) runs to load balance among data stores within the data store cluster.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

LOAD\_BALANCE\_INTERVAL or LBI

**Datastore Count attribute**

**Description**

The number of data stores in the data store cluster.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATASTORE\_COUNT or DC0

**Total Capacity attribute**

**Description**

The storage capacity in GB of this data store cluster.

**Type**

Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CAPACITY

**Capacity Used attribute**

**Description**

The amount of allocated storage in GB for the data store cluster.

**Type**

Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
CAPACITY_USED or CU	
<b><u>Percent Capacity Free attribute</u></b>	
<b>Description</b>	The percentage of unused capacity in the data store cluster.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
PERCENT_CAPACITY_FREE or PCF	
<b><u>Include Data In Summarization 0 attribute</u></b>	
<b>Description</b>	This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Value Exceeds Maximum (2147483647)</li> <li>• Value Exceeds Minimum (-2147483648)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Source</b>	The source for this attribute is derived: $(Capacity < 0) \vee (Capacity\_Used < 0) ? 0 : 1$ .
<b>Warehouse name</b>	
INCLUDE_DATA_IN_SUMMARIZATION_0 or IDIS0	
<b><u>Include Data In Summarization 1 attribute</u></b>	
<b>Description</b>	This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Value Exceeds Maximum (2147483647)</li> <li>• Value Exceeds Minimum (-2147483648)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Source</b>	The source for this attribute is derived: $(Percent\_Capacity\_Free < 0) ? 0 : 1$ .
<b>Warehouse name</b>	
INCLUDE_DATA_IN_SUMMARIZATION_1 or IDIS1	

## Datastore Host Disks attribute group

This attribute group contains a mapping from a data store to a host disk.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.



## Attribute descriptions

The following list contains information about each attribute in the Datastore Host Disks attribute group:

**Node attribute: This attribute is a key attribute.**

### Description

The managed system name of the agent.

### Type

String

### Source

The source for this attribute is the agent.

### Warehouse name

NODE

**Timestamp attribute**

### Description

The local time at the agent when the data was collected.

### Type

String

### Source

The source for this attribute is the agent.

### Warehouse name

TIMESTAMP

**DataCenter attribute: This attribute is a key attribute.**

### Description

The name of the data center that contains this disk.

### Type

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

### Warehouse name

DATACENTER

**Host attribute: This attribute is a key attribute.**

### Description

The name of the host system for this disk.

### Type

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

### Warehouse name

HOST

**Datastore attribute**

### Description

The name of the data store on this disk.

### Type

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATASTORE

**Disk attribute:** This attribute is a key attribute.

**Description**

The name of the disk.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DISK

**NodeID attribute:** This attribute is a key attribute.

**Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

## Datastore Topology attribute group

This attribute group contains information about the storage topology of the virtual infrastructure.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the Datastore Topology attribute group:

**Node attribute:** This attribute is a key attribute.

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**NodeName attribute**

**Description**

The name of this node in the tree.

**Type**

String

<b>Warehouse name</b>	NODENAME
<b><u>NodeID attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The identifier for this node in the topology.
<b>Type</b>	String
<b>Warehouse name</b>	NODEID
<b><u>NodeType attribute</u></b>	
<b>Description</b>	The kind of node in the tree.
<b>Type</b>	String
<b>Warehouse name</b>	NODETYPE
<b><u>NodeStatus attribute</u></b>	
<b>Description</b>	The status of this node.
<b>Type</b>	String
<b>Warehouse name</b>	NODESTATUS
<b><u>ConnectToNode attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	Indicates a connection from the NodeID to the node specified here.
<b>Type</b>	String
<b>Warehouse name</b>	CONNECTTONODE or C
<b><u>ConnectionType attribute</u></b>	
<b>Description</b>	The connection type from this node to the parent of this node.
<b>Type</b>	String
<b>Warehouse name</b>	CONNECTIONTYPE or C0
<b><u>Managed System Name attribute</u></b>	
<b>Description</b>	The managed system name that is associated with the data.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	MSN
<b><u>Datacenter attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The name of this data center.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise

Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
DATACENTER

## Datastores attribute group

This attribute group displays general information about data stores.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the Datastores attribute group:

**Node attribute:** This attribute is a key attribute.

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Name attribute:** This attribute is a key attribute.

**Description**

The name of the data store.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NAME

**Datacenter attribute:** This attribute is a key attribute.

**Description**

The name of the data center for the data store.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
DATACENTER	
<b><u>Type attribute</u></b>	
<b>Description</b>	The type for the data store.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
TYPE	
<b><u>Overall Status attribute</u></b>	
<b>Description</b>	The overall status for the data store.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
OVERALL_STATUS or OS	
<b><u>Accessible attribute</u></b>	
<b>Description</b>	Whether the data store is accessible or not.
<b>Type</b>	<p>Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Yes (1)</li> <li>• No (0)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
ACCESSIBLE	
<b><u>Remote Host Address attribute</u></b>	
<b>Description</b>	The remote host address for the data store.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
REMOTE_HOST_ADDRESS or RHA	
<b><u>Remote Path attribute</u></b>	
<b>Description</b>	The remote path for the data store.

<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	REMOTE_PATH or RP
<b><u>URL attribute</u></b>	
<b>Description</b>	The remote URL for the data store.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	URL
<b><u>Capacity attribute</u></b>	
<b>Description</b>	The storage capacity in MB of the data store.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	CAPACITY
<b><u>Used Space attribute</u></b>	
<b>Description</b>	The amount of allocated storage in MB for the data store.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	USED_SPACE
<b><u>Free Space attribute</u></b>	
<b>Description</b>	The amount of available storage in MB for the data store.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul>

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

FREE\_SPACE

**Percent Used attribute**

**Description**

The percentage of used space in the data store.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PERCENT\_USED or PU

**Percent Free attribute**

**Description**

The percentage of unused space in this data store.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PERCENT\_FREE or PF

**Maximum File Size attribute**

**Description**

The maximum size in KB of a file that might be allocated on this data store.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)
- > 2048GB (-2)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MAXIMUM\_FILE\_SIZE or MFS

**Connected Hosts attribute**

**Description**

The number of hosts that are connected to the data store.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CONNECTED\_HOSTS or CH

**Connected VMs attribute**

**Description**

The number of virtual machines that are connected to the data store.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CONNECTED\_VMS or CV

**Connected Clusters attribute****Description**

The number of clusters with hosts connected to this data store.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CONNECTED\_CLUSTERS or CC

**Managed System Name attribute****Description**

The managed system name of the storage monitoring agent that is associated with the data.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MSN

**Total Read attribute****Description**

The total kilobytes read per second by all virtual machines that are configured for this datastore.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TOTAL\_READ\_KBPS or TRK

**Total Write attribute****Description**

The total kilobytes written per second by all virtual machines that are configured for this datastore.



<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	TOTAL_WRITE_KBPS or TWK
<b><u>Total IO attribute</u></b>	
<b>Description</b>	The sum of total kilobytes read and written per second by all virtual machines that are configured for this datastore.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	TOTAL_IO_KBPS or TIK
<b><u>Datastore MOREf attribute</u></b>	
<b>Description</b>	The internal managed object reference name of the datastore.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	DATASTORE_MOREF or DM
<b><u>NetApp Volume Name attribute</u></b>	
<b>Description</b>	A best effort guess at the corresponding NetApp volume name for the datastore.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> <li>• No DNS Record (No_DNS_Record)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	NETAPP_VOLUME_NAME or NVN
<b><u>Overcommitted attribute</u></b>	
<b>Description</b>	The amount of space, in megabytes, that the datastore has provisioned without available backing storage. This value can be negative, with a lower bound of negative free space.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the

Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

OVERCOMMITTED or O

**Percent Overcommitted attribute**

**Description**

The percentage of the total capacity of the datastore, which is overcommitted. This attribute has a lower bound of -100% and no upper bound.

**Type**

Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PERCENT\_OVERCOMMITTED or PO

**NodeID attribute**

**Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

**Snapshot Storage Consumed attribute**

**Description**

The amount of disk space (in GB) that is used by the snapshots.

**Type**

Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SNAPSHOT\_STORAGE\_CONSUMED or SSC

**Percent Snapshot Storage Consumed attribute**

**Description**

The percentage amount of disk space that is used by the snapshots.

**Type**

Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PERCENT\_SNAPSHOT\_STORAGE\_CONSUMED or PSSC

### **Datastore Cluster attribute**

#### **Description**

The name of the data store cluster that the data store belongs to.

#### **Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

DATASTORE\_CLUSTER or DC

### **Include Data In Summarization 0 attribute**

#### **Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Source**

The source for this attribute is derived: (Capacity < 0 ) || (Used\_Space < 0 ) || (Free\_Space < 0 ) || (Percent\_Used < 0 ) || (Percent\_Snapshot\_Storage\_Consumed < 0 ) || (Percent\_Free < 0 )? 0 : 1.

#### **Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

### **Include Data In Summarization 1 attribute**

#### **Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Source**

The source for this attribute is derived: (Maximum\_File\_Size < 0 )? 0 : 1.

#### **Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

### **Include Data In Summarization 2 attribute**

#### **Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Connected\_Hosts < 0 ) || (Connected\_VMs < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_2 or IDIS2

**Include Data In Summarization 3 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Total\_Read\_KBps < 0 ) || (Total\_Write\_KBps < 0 ) || (Total\_IO\_KBps < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_3 or IDIS3

**Include Data In Summarization 4 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Overcommitted < 0 ) || (Percent\_Overcommitted < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_4 or IDIS4

**Include Data In Summarization 5 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Snapshot\_Storage\_Consumed < 0)? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_5 or IDIS5

## Director attribute group

This attribute group contains information about the IBM Systems Director configuration.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Director attribute group:

**Node attribute:** This attribute is a key attribute.

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute****Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**DirectorServer attribute****Description**

The host name of the IBM Director Server.

**Type**

String

**Source**

The source for this attribute is Script data.

**Warehouse name**

DIRECTORSERVER or D

**DirectorPort attribute****Description**

The port number for the IBM Director Server.

**Type**

String

**Source**

The source for this attribute is Script data.

**Warehouse name**

DIRECTORPORT or D0

### UseTEPCredential attribute

#### **Description**

Use Tivoli Enterprise Portal credentials for IBM Systems Director authentication.

#### **Type**

String

#### **Source**

The source for this attribute is Script data.

#### **Warehouse name**

USETEPCREDENTIAL or U

## **Distributed Virtual Portgroups attribute group**

This attribute group contains information about the distributed virtual portgroups in the virtual infrastructure.

### **Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

### **Attribute descriptions**

The following list contains information about each attribute in the Distributed Virtual Portgroups attribute group:

**Node attribute: This attribute is a key attribute.**

#### **Description**

The managed system name of the agent.

#### **Type**

String

#### **Source**

The source for this attribute is the agent.

#### **Warehouse name**

NODE

### **Timestamp attribute**

#### **Description**

The local time at the agent when the data was collected.

#### **Type**

String

#### **Source**

The source for this attribute is the agent.

#### **Warehouse name**

TIMESTAMP

**Datacenter attribute: This attribute is a key attribute.**

#### **Description**

The name of the data center that uses this distributed virtual portgroup.

#### **Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

DATACENTER

**Switch attribute: This attribute is a key attribute.**

#### **Description**

The name of the distributed virtual switch associated with this portgroup.

#### **Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SWITCH\_NAME or SN

**Portgroup attribute: This attribute is a key attribute.**

**Description**

The name of this portgroup.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PORTGROUP\_NAME or PN

**Overall Status attribute**

**Description**

The overall alarm status of the portgroup. A value of red or yellow indicates that an alarm has been triggered for the portgroup.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

OVERALL\_STATUS or OS

**Type attribute**

**Description**

The type of this portgroup.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TYPE

**Blocked attribute**

**Description**

Whether traffic is being blocked for this portgroup.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
BLOCKED	
<b><u>Inbound Shaping Enabled attribute</u></b>	
<b>Description</b>	Whether inbound traffic shaping is enabled for this portgroup.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
INBOUND_SHAPING_ENABLED or ISE	
<b><u>Inbound Shaping Average Bandwidth attribute</u></b>	
<b>Description</b>	The inbound traffic shaping target for average bandwidth.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
INBOUND_SHAPING_AVERAGE_BANDWIDTH or ISAB	
<b><u>Inbound Shaping Burst Size attribute</u></b>	
<b>Description</b>	The inbound traffic shaping target for burst size.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
INBOUND_SHAPING_BURST_SIZE or ISBS	
<b><u>Inbound Shaping Peak Bandwidth attribute</u></b>	
<b>Description</b>	The inbound traffic shaping target for peak bandwidth.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
INBOUND_SHAPING_PEAK_BANDWIDTH or ISPB	
<b><u>Outbound Shaping Enabled attribute</u></b>	
<b>Description</b>	Whether outbound traffic shaping is enabled for this portgroup.



**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

OUTBOUND\_SHAPING\_ENABLED or OSE

**Outbound Shaping Average Bandwidth attribute****Description**

The outbound traffic shaping target for average bandwidth.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

OUTBOUND\_SHAPING\_AVERAGE\_BANDWIDTH or OSAB

**Outbound Shaping Burst Size attribute****Description**

The outbound traffic shaping target for burst size.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

OUTBOUND\_SHAPING\_BURST\_SIZE or OSBS

**Outbound Shaping Peak Bandwidth attribute****Description**

The outbound traffic shaping target for peak bandwidth.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

OUTBOUND\_SHAPING\_PEAK\_BANDWIDTH or OSPB

**VLAN Type attribute****Description**

The type of VLAN used for this portgroup.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VLAN\_TYPE

**VLAN ID attribute**

**Description**

The VLAN ID used by this portgroup. For portgroups that support ranges of VLANs or multiple VLANs, this value is set to Unavailable.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VLAN\_ID

**Include Data In Summarization 0 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived:  $(\text{Inbound\_Shaping\_Average\_Bandwidth} < 0) \vee (\text{Inbound\_Shaping\_Burst\_Size} < 0) \vee (\text{Inbound\_Shaping\_Peak\_Bandwidth} < 0) ? 0 : 1$ .

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

**Include Data In Summarization 1 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived:  $(\text{Outbound\_Shaping\_Peak\_Bandwidth} < 0) \vee (\text{Outbound\_Shaping\_Average\_Bandwidth} < 0) \vee (\text{Outbound\_Shaping\_Burst\_Size} < 0) ? 0 : 1$ .

**Warehouse name**  
INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

## Distributed Virtual Switch Health attribute group

This attribute group contains information about the health check of host system for distributed virtual switches.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the Distributed Virtual Switch Health attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Source attribute: This attribute is a key attribute.**

**Description**

The host name of the data source.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SOURCE

**Datacenter attribute: This attribute is a key attribute.**

**Description**

The name of the data center that uses this distributed virtual switch.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER

**Switch attribute: This attribute is a key attribute.**

**Description**

The name of the Distributed Virtual Switch.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SWITCH\_NAME or SN

**Portgroup attribute: This attribute is a key attribute.**

**Description**

The name of the portgroup.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PORTGROUP\_NAME or PN

**Uplink attribute: This attribute is a key attribute.**

**Description**

The name of the uplink that is used by the host to connect to the Distributed Virtual Switch.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

UPLINK\_NAME or UN

**Host attribute**

**Description**

The host name of the ESX server that is connected to the Distributed Virtual Switch.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

HOST

**NIC attribute**

**Description**

The name of the physical network interface card (NIC) that is associated with the uplink.

<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	NIC_NAME
<b><u>Uplink Key attribute</u></b>	
<b>Description</b>	The uplink key that is used by the host to connect to the Distributed Virtual Switch.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	UPLINK_KEY
<b><u>Summary attribute</u></b>	
<b>Description</b>	The health check summary.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	SUMMARY
<b><u>MTU Mismatch attribute</u></b>	
<b>Description</b>	Indicates whether the Maximum Transmission Unit (MTU) configured in the vSphere Distributed Switch is mismatched with the value configured in the Physical NIC. This MTU mismatch status is available only for MTU Health Check type.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> <li>Yes (true)</li> <li>No (false)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	MTU_MISMATCH or MM
<b><u>DVS Teaming Status attribute</u></b>	

**Description**

The teaming check status of the Distributed Virtual Switch. This teaming check status is available only for the VLAN Health check and the Teaming and Failover Health check.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DVS\_TEAMING\_STATUS or DTS

**Health Check Type attribute****Description**

The type of the health check.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- VLAN Health (com.vmware.vim.VMwareDVSMtuHealthCheckResult)
- MTU Health (com.vmware.vim.VMwareDVSVlanHealthCheckResult)
- Teaming and Failover Health (com.vmware.vim.VMwareDVSTeamingHealthCheckResult)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

HEALTH\_CHECK\_TYPE or HCT

## Distributed Virtual Switches attribute group

This attribute group contains information about the distributed virtual switches in the virtual infrastructure.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Distributed Virtual Switches attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute****Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

<b>Warehouse name</b>	
TIMESTAMP	
<b><u>Datacenter attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The name of the data center that uses this distributed virtual switch.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
DATACENTER	
<b><u>Switch attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The name of the distributed virtual switch.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
SWITCH_NAME or SN	
<b><u>Overall Status attribute</u></b>	
<b>Description</b>	The overall alarm status of the distributed virtual switch. A value of red or yellow indicates that an alarm has been triggered for the distributed virtual switch.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
OVERALL_STATUS or OS	
<b><u>Number Of Portgroups attribute</u></b>	
<b>Description</b>	The number of portgroups, including uplink portgroups, attached to this switch.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
NUMBER_OF_PORTGROUPS or NOP	
<b><u>Number Uplinks attribute</u></b>	

**Description**

The number of distributed virtual uplinks that are attached to this switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_OF\_UPLINKS or NOU

**Number Hosts attribute****Description**

The number of hosts that are attached to this switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_OF\_HOSTS or NOH

**Number VMs attribute****Description**

The number of virtual machines that are attached to this switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_OF\_VMS or NOV

**Number Ports attribute****Description**

The current number of ports, excluding conflict ports, of this switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_OF\_PORTS or NOP0

**Max Number Ports attribute****Description**

The maximum number of ports, excluding conflict ports, allowed for this switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:



- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MAX\_NUMBER\_OF\_PORTS or MNOP

**Transmitted attribute**

**Description**

The total transmission rate in KBps of the uplinks on this switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TRANSMITTED or T

**Received attribute**

**Description**

The total reception rate in KBps of the uplinks on this switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

RECEIVED

**Usage attribute**

**Description**

The total rate in KBps that the uplinks are transmitting and receiving data on this switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

USAGE

**Include Data In Summarization 0 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Number\_Of\_Portgroups < 0 ) || (Number\_Of\_Uplinks < 0 ) || (Number\_Of\_Ports < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

**Include Data In Summarization 1 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Number\_Of\_Hosts < 0 ) || (Number\_Of\_VMs < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

**Include Data In Summarization 2 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Transmitted < 0 ) || (Received < 0 ) || (Usage < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_2 or IDIS2

**Include Data In Summarization 3 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Max\_Number\_Of\_Ports < 0)? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_3 or IDIS3

## Distributed Virtual Uplinks attribute group

This attribute group contains information about the distributed virtual uplinks in the virtual infrastructure.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Distributed Virtual Uplinks attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Datacenter attribute: This attribute is a key attribute.**

**Description**

The name of the data center that uses this distributed virtual uplink.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER

**Switch attribute: This attribute is a key attribute.**

**Description**

The name of the distributed virtual switch that is attached to this uplink.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SWITCH\_NAME or SN

**Portgroup attribute**

**Description**

The name of the portgroup for this uplink.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PORTGROUP\_NAME or PN

**Uplink attribute**

**Description**

The name of this uplink.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

UPLINK\_NAME or UN

**Overall Status attribute**

**Description**

The overall alarm status of the uplink. A value of red or yellow indicates that an alarm has been triggered for the uplink.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

OVERALL\_STATUS or OS

**Component State attribute**

**Description**

The component state of the uplink.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

COMPONENT\_STATE or CS

**Server Hostname attribute**

**Description**

The host name of the ESX server to which the uplink belongs.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

HOST\_SYSTEM or HS

**NIC attribute****Description**

The name of the physical NIC associated with this uplink.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NIC

**Transmitted attribute****Description**

The total transmission rate in KBps of this uplink's physical NIC.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TRANSMITTED or T

**Received attribute****Description**

The total reception rate in KBps of this uplink's physical NIC.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

RECEIVED

**Usage attribute****Description**

The total rate in KBps that data is being transmitted and received data on this uplink's physical NIC.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the

Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

USAGE

**Status attribute**

**Description**

The current status, up or down, of the NIC.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

LINK\_STATUS or LS

**Link Speed attribute**

**Description**

The current operating speed of the NIC in Mbps.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

LINK\_SPEED

**Duplex attribute**

**Description**

The current operating mode of the NIC.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DUPLEX

**Managed System Name attribute**

**Description**

The managed system name of the subnode for the ESX server of the uplink.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
SUBNODE_MSN or SM	
<b><u>Link Utilization attribute</u></b>	
<b>Description</b>	The percent usage of the NIC relative to the capacity of the link (including duplex).
<b>Type</b>	<p>Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
LINK_UTILIZATION or LU	
<b><u>Include Data In Summarization 0 attribute</u></b>	
<b>Description</b>	This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Value Exceeds Maximum (2147483647)</li> <li>• Value Exceeds Minimum (-2147483648)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Source</b>	The source for this attribute is derived: (Transmitted < 0 )    (Received < 0 )    (Usage < 0 )? 0 : 1.
<b>Warehouse name</b>	
INCLUDE_DATA_IN_SUMMARIZATION_0 or IDIS0	
<b><u>Include Data In Summarization 1 attribute</u></b>	
<b>Description</b>	This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Value Exceeds Maximum (2147483647)</li> <li>• Value Exceeds Minimum (-2147483648)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Source</b>	The source for this attribute is derived: (Link_Utilization < 0 )? 0 : 1.
<b>Warehouse name</b>	
INCLUDE_DATA_IN_SUMMARIZATION_1 or IDIS1	
<b><u>Include Data In Summarization 2 attribute</u></b>	

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Link\_Speed < 0)? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_2 or IDIS2

## ESX Performance Object Status attribute group

The Performance Object Status attribute group contains information that reflects the status of other attribute groups so you can see the status of all of the performance objects that make up this application all at once. Each of these other performance attribute groups is represented by a row in this table (or other type of view). The status for an attribute group reflects the result of the last attempt to collect data for that attribute group, which allows you to see whether the agent is performing correctly. Unlike other attribute groups, the Performance Object Status attribute group does not reflect the state of the monitored application. This attribute group is most often used to determine why data is not available for one of the performance attribute groups.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the ESX Performance Object Status attribute group:

**Node attribute:** This attribute is a key attribute.

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute****Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Query Name attribute:** This attribute is a key attribute.

**Description**

The name of the attribute group.

**Type**

String



<b>Warehouse name</b>	
QUERY_NAME or ATTRGRP	
<b><u>Object Name attribute</u></b>	
<b>Description</b>	The name of the performance object.
<b>Type</b>	String
<b>Warehouse name</b>	
OBJECT_NAME or OBJNAME	
<b><u>Object Type attribute</u></b>	
<b>Description</b>	The type of the performance object.
<b>Type</b>	<p>Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• WMI (0)</li> <li>• PERFMON (1)</li> <li>• WMI ASSOCIATION GROUP (2)</li> <li>• JMX (3)</li> <li>• SNMP (4)</li> <li>• SHELL COMMAND (5)</li> <li>• JOINED GROUPS (6)</li> <li>• CIMOM (7)</li> <li>• CUSTOM (8)</li> <li>• ROLLUP DATA (9)</li> <li>• WMI REMOTE DATA (10)</li> <li>• LOG FILE (11)</li> <li>• JDBC (12)</li> <li>• CONFIG DISCOVERY (13)</li> <li>• NT EVENT LOG (14)</li> <li>• FILTER (15)</li> <li>• SNMP EVENT (16)</li> <li>• PING (17)</li> <li>• DIRECTOR DATA (18)</li> <li>• DIRECTOR EVENT (19)</li> <li>• SSH REMOTE SHELL COMMAND (20)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
OBJECT_TYPE or OBJTYPE	
<b><u>Object Status attribute</u></b>	
<b>Description</b>	The status of the performance object.
<b>Type</b>	<p>Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• ACTIVE (0)</li> <li>• INACTIVE (1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
OBJECT_STATUS or OBJSTTS	
<b><u>Error Code attribute</u></b>	

**Description**

The error code that is associated with the query.

**Type**

Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NO ERROR (0)
- GENERAL ERROR (1)
- OBJECT NOT FOUND (2)
- COUNTER NOT FOUND (3)
- NAMESPACE ERROR (4)
- OBJECT CURRENTLY UNAVAILABLE (5)
- COM LIBRARY INIT FAILURE (6)
- SECURITY INIT FAILURE (7)
- PROXY SECURITY FAILURE (9)
- NO INSTANCES RETURNED (10)
- ASSOCIATOR QUERY FAILED (11)
- REFERENCE QUERY FAILED (12)
- NO RESPONSE RECEIVED (13)
- CANNOT FIND JOINED QUERY (14)
- CANNOT FIND JOIN ATTRIBUTE IN QUERY 1 RESULTS (15)
- CANNOT FIND JOIN ATTRIBUTE IN QUERY 2 RESULTS (16)
- QUERY 1 NOT A SINGLETON (17)
- QUERY 2 NOT A SINGLETON (18)
- NO INSTANCES RETURNED IN QUERY 1 (19)
- NO INSTANCES RETURNED IN QUERY 2 (20)
- CANNOT FIND ROLLUP QUERY (21)
- CANNOT FIND ROLLUP ATTRIBUTE (22)
- FILE OFFLINE (23)
- NO HOSTNAME (24)
- MISSING LIBRARY (25)
- ATTRIBUTE COUNT MISMATCH (26)
- ATTRIBUTE NAME MISMATCH (27)
- COMMON DATA PROVIDER NOT STARTED (28)
- CALLBACK REGISTRATION ERROR (29)
- MDL LOAD ERROR (30)
- AUTHENTICATION FAILED (31)
- CANNOT RESOLVE HOST NAME (32)
- SUBNODE UNAVAILABLE (33)
- SUBNODE NOT FOUND IN CONFIG (34)
- ATTRIBUTE ERROR (35)
- CLASSPATH ERROR (36)
- CONNECTION FAILURE (37)
- FILTER SYNTAX ERROR (38)
- FILE NAME MISSING (39)
- SQL QUERY ERROR (40)
- SQL FILTER QUERY ERROR (41)
- SQL DB QUERY ERROR (42)
- SQL DB FILTER QUERY ERROR (43)
- PORT OPEN FAILED (44)
- ACCESS DENIED (45)
- TIMEOUT (46)
- NOT IMPLEMENTED (47)
- REQUESTED A BAD VALUE (48)
- RESPONSE TOO BIG (49)
- GENERAL RESPONSE ERROR (50)

- SCRIPT NONZERO RETURN (51)
- SCRIPT NOT FOUND (52)
- SCRIPT LAUNCH ERROR (53)
- CONF FILE DOES NOT EXIST (54)
- CONF FILE ACCESS DENIED (55)
- INVALID CONF FILE (56)
- EIF INITIALIZATION FAILED (57)
- CANNOT OPEN FORMAT FILE (58)
- FORMAT FILE SYNTAX ERROR (59)
- REMOTE HOST UNAVAILABLE (60)
- EVENT LOG DOES NOT EXIST (61)
- PING FILE DOES NOT EXIST (62)
- NO PING DEVICE FILES (63)
- PING DEVICE LIST FILE MISSING (64)
- SNMP MISSING PASSWORD (65)
- DISABLED (66)
- URLS FILE NOT FOUND (67)
- XML PARSE ERROR (68)
- NOT INITIALIZED (69)
- ICMP SOCKETS FAILED (70)
- DUPLICATE CONF FILE (71)
- KVM NO DATASOURCES (1000)
- KVM DATASOURCE LOGIN FAILED (1005)
- KVM DATASOURCE NOT FOUND (1010)
- SUBNODE UNAVAILABLE (1033)
- KVM PROVIDER RESET (2222)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

ERROR\_CODE or ERRCODE

**Last Collection Start attribute**

**Description**

The most recent time a data collection of this group started.

**Type**

Timestamp with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NOT COLLECTED (0691231190000000)
- NOT COLLECTED (0000000000000001)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

LAST\_COLLECTION\_START or COLSTRT

**Last Collection Finished attribute**

**Description**

The most recent time a data collection of this group finished.

**Type**

Timestamp with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NOT COLLECTED (0691231190000000)
- NOT COLLECTED (0000000000000001)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
LAST_COLLECTION_FINISHED or COLFINI	
<b><u>Last Collection Duration attribute</u></b>	
<b>Description</b>	The duration of the most recently completed data collection of this group in seconds.
<b>Type</b>	Real number (32-bit counter) with two decimal places of precision
<b>Warehouse name</b>	
LAST_COLLECTION_DURATION or COLDURA	
<b><u>Average Collection Duration attribute</u></b>	
<b>Description</b>	The average duration of all data collections of this group in seconds.
<b>Type</b>	Real number (32-bit counter) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• NO DATA (-100)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
AVERAGE_COLLECTION_DURATION or COLAVGD	
<b><u>Refresh Interval attribute</u></b>	
<b>Description</b>	The interval at which this group is refreshed in seconds.
<b>Type</b>	Integer (32-bit counter)
<b>Warehouse name</b>	
REFRESH_INTERVAL or REFRINT	
<b><u>Number of Collections attribute</u></b>	
<b>Description</b>	The number of times this group has been collected since agent start.
<b>Type</b>	Integer (32-bit counter)
<b>Warehouse name</b>	
NUMBER_OF_COLLECTIONS or NUMCOLL	
<b><u>Cache Hits attribute</u></b>	
<b>Description</b>	The number of times an external data request for this group was satisfied from the cache.
<b>Type</b>	Integer (32-bit counter)
<b>Warehouse name</b>	
CACHE_HITS or CACHEHT	
<b><u>Cache Misses attribute</u></b>	
<b>Description</b>	The number of times an external data request for this group was not available in the cache.
<b>Type</b>	Integer (32-bit counter)
<b>Warehouse name</b>	
CACHE_MISSES or CACHEMS	
<b><u>Cache Hit Percent attribute</u></b>	

**Description**

The percentage of external data requests for this group that were satisfied from the cache.

**Type**

Real number (32-bit counter) with two decimal places of precision

**Warehouse name**

CACHE\_HIT\_PERCENT or CACHPCT

**Intervals Skipped attribute****Description**

The number of times a background data collection for this group was skipped because the previous collection was still running when the next one was due to start.

**Type**

Integer (32-bit counter)

**Warehouse name**

INTERVALS\_SKIPPED or INTSKIP

**Events attribute group**

This attribute group contains events that are not specific to an ESX server.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Events attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute****Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Source Hostname attribute: This attribute is a key attribute.**

**Description**

The host name of the data source that originated this event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SOURCE\_HOSTNAME or SH

**Event Seq Number attribute: This attribute is a key attribute.**

**Description**

A sequence number for this event.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

EVENT\_SEQ\_NUMBER or ESN

**UserId attribute****Description**

The user ID that caused the event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Not applicable (Not applicable)
- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

USERID

**Event Time attribute****Description**

The time that the event occurred.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

EVENT\_TIME

**Event attribute****Description**

The event data string.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

EVENT

**Compute Resource attribute****Description**

The compute resource that is associated with this event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise

Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

COMPUTE\_RESOURCE or CR

**Datacenter attribute**

**Description**

The data center that is associated with this event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER

**Virtual Machine attribute**

**Description**

The virtual machine that is associated with this event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VIRTUAL\_MACHINE or VM

**Virtual Machine UUID attribute**

**Description**

The UUID of the virtual machine that is associated with this event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VIRTUAL\_MACHINE\_UUID or VMU

**Category attribute**

**Description**

The severity level that is associated with the event by VMware.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
CATEGORY	
<b><u>Event Type attribute</u></b>	
<b>Description</b>	The type of event that is given by VMware.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
EVENT_TYPE	
<b><u>Event Text attribute</u></b>	
<b>Description</b>	The full event data string.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
EVENT_TEXT	
<b><u>Event Type ID attribute</u></b>	
<b>Description</b>	The type ID of the event that is given by VMware. This is unavailable unless the event is an extended event.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
EVENT_TYPE_ID or ETI	
<b><u>Entity Type attribute</u></b>	
<b>Description</b>	The type of entity of the event.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
ENTITY_TYPE or ET	
<b><u>Datastore attribute</u></b>	
<b>Description</b>	The name of the data store that is associated with the event.



**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATASTORE

**Datastore UUID attribute****Description**

The Universal Unique ID of the data store that is associated with the event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATASTORE\_UUID or DU

**Include Data In Summarization 0 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Event\_Seq\_Number < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

## Monitored Servers attribute group

This attribute group is the current list of ESX servers that are being monitored.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Monitored Servers attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

<b>Warehouse name</b>	NODE
<b><u>Timestamp attribute</u></b>	
<b>Description</b>	The local time at the agent when the data was collected.
<b>Type</b>	String
<b>Source</b>	The source for this attribute is the agent.
<b>Warehouse name</b>	TIMESTAMP
<b><u>Subnode MSN attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The Managed System Name of the subnode agent.
<b>Type</b>	String
<b>Warehouse name</b>	SUBNODE_MSN or SN_MSN
<b><u>Subnode Affinity attribute</u></b>	
<b>Description</b>	The affinity for the subnode agent.
<b>Type</b>	String
<b>Warehouse name</b>	SUBNODE_AFFINITY or SN_AFFIN
<b><u>Subnode Type attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The Node Type of this subnode.
<b>Type</b>	String
<b>Warehouse name</b>	SUBNODE_TYPE or SN_TYPE
<b><u>Subnode Resource Name attribute</u></b>	
<b>Description</b>	The Resource Name of the subnode agent.
<b>Type</b>	String
<b>Warehouse name</b>	SUBNODE_RESOURCE_NAME or SN_RES
<b><u>Subnode Version attribute</u></b>	
<b>Description</b>	The Version of the subnode agent.
<b>Type</b>	String
<b>Warehouse name</b>	SUBNODE_VERSION or SN_VER

## Networked Servers attribute group

This attribute group lists the hosts on each network.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the Networked Servers attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute****Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Datacenter attribute: This attribute is a key attribute.****Description**

The data center that this network is on.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER

**Network attribute: This attribute is a key attribute.****Description**

The name of the network.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NETWORK

**Switch attribute: This attribute is a key attribute.****Description**

The switch that the network uses.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SWITCH

**Server Hostname attribute: This attribute is a key attribute.**

**Description**

The host name of the ESX server that is connected to the network.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVER\_HOSTNAME or SH

**Transmitted attribute****Description**

The total transmission rate in KBps of the host on this virtual switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TRANSMITTED or T

**Received attribute****Description**

The total reception rate in KBps of the host on this virtual switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

RECEIVED

**Usage attribute****Description**

The total rate in KBps that the host is transmitting and receiving data on this virtual switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

USAGE

**Managed System Name attribute****Description**

The managed system name of the subnode for the ESX server.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise

Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SUBNODE\_MSN or SM

**Include Data In Summarization 0 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Transmitted < 0 ) || (Received < 0 ) || (Usage < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

## Networked Virtual Machines attribute group

This attribute group lists the virtual machine NICs on each network.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Networked Virtual Machines attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Datacenter attribute: This attribute is a key attribute.**

**Description**

The data center that this virtual machine NIC is on.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER

**Network attribute: This attribute is a key attribute.**

**Description**

The name of the network the virtual machine NIC is on.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NETWORK

**Switch attribute: This attribute is a key attribute.**

**Description**

The name of the virtual switch to which the virtual machine NIC is connected.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SWITCH

**Server Hostname attribute: This attribute is a key attribute.**

**Description**

The hostname of the ESX server on which the virtual machine resides.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVER\_HOSTNAME or SH

**Virtual Machine attribute: This attribute is a key attribute.**

**Description**

The name of the virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VIRTUAL\_MACHINE or VM

**VM NIC attribute: This attribute is a key attribute.**

**Description**

The name of the virtual machine NIC.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_NIC

**Transmitted attribute**

**Description**

The total transmission rate in KBps of this virtual machine NIC.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TRANSMITTED or T

**Received attribute**

**Description**

The total reception rate in KBps of this virtual machine NIC.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

RECEIVED

**Usage attribute**

**Description**

The total rate in KBps that data is being transmitted and received data on this virtual machine NIC.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

USAGE

**Managed System Name attribute**

**Description**

The managed system name of the subnode for the ESX server of the virtual machine NIC.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SUBNODE\_MSN or SM

**Include Data In Summarization 0 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Transmitted < 0 ) || (Received < 0 ) || (Usage < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

## Networked Virtual Switches attribute group

This attribute group contains information about the standard virtual switches in the virtual infrastructure grouped by network.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Networked Virtual Switches attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute****Description**

The local time at the agent when the data was collected.

**Type**

String



**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Datacenter attribute:** This attribute is a key attribute.

**Description**

The name of the data center that uses this virtual switch.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER

**Server Hostname attribute:** This attribute is a key attribute.

**Description**

The hostname of the ESX server to which the virtual switch belongs.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVER\_HOSTNAME or SH

**Switch attribute:** This attribute is a key attribute.

**Description**

The name of the virtual switch.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SWITCH

**Network attribute:** This attribute is a key attribute.

**Description**

The name of the network with which the virtual switch is associated.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NETWORK

**Number NICs attribute**

**Description**

The number of NICs connected to the virtual switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_OF\_NICS or NON

**Transmitted attribute****Description**

The total transmission rate in KBps of the host on this virtual switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TRANSMITTED or T

**Received attribute****Description**

The total reception rate in KBps of the host on this virtual switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

RECEIVED

**Usage attribute****Description**

The total rate in KBps that the host is transmitting and receiving data on this virtual switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

USAGE

**Managed System Name attribute****Description**

The managed system name of the subnode for the ESX server of the virtual switch.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise

Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SUBNODE\_MSN or SM

**Include Data In Summarization 0 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Number\_Of\_NICs < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

**Include Data In Summarization 1 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Transmitted < 0 ) || (Received < 0 ) || (Usage < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

## Networks attribute group

This attribute group contains information about the networks in the virtual infrastructure.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Networks attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute****Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Datacenter attribute: This attribute is a key attribute.****Description**

The name of the data center that uses this network.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER

**Network attribute: This attribute is a key attribute.****Description**

The name of the network.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NETWORK

**Overall Status attribute****Description**

The overall alarm status of the network. A value of red or yellow indicates that an alarm has been triggered for the network.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

OVERALL\_STATUS or OS

**Type attribute: This attribute is a key attribute.****Description**

The type of network.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NETWORK\_TYPE or NT

**Number Hosts attribute****Description**

The number of hosts connected to the network.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_OF\_HOSTS or NOH

**Number VMs attribute****Description**

The number of virtual machines connected to the network.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_OF\_VMS or NOV

**Distributed Switch attribute****Description**

The name of the distributed virtual switch for this network, if applicable.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DISTRIBUTED\_SWITCH or DS

## Performance Object Status attribute group

The Performance Object Status attribute group contains information that reflects the status of other attribute groups so you can see the status of all of the performance objects that make up this application all at once. Each of these other performance attribute groups is represented by a row in this table (or other type of view). The status for an attribute group reflects the result of the last attempt to collect data for that attribute group, which allows you to see whether the agent is performing correctly. Unlike other

attribute groups, the Performance Object Status attribute group does not reflect the state of the monitored application. This attribute group is most often used to determine why data is not available for one of the performance attribute groups.

#### **Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

#### **Attribute descriptions**

The following list contains information about each attribute in the Performance Object Status attribute group:

**Node attribute: This attribute is a key attribute.**

##### **Description**

The managed system name of the agent.

##### **Type**

String

##### **Source**

The source for this attribute is the agent.

##### **Warehouse name**

NODE

#### **Timestamp attribute**

##### **Description**

The local time at the agent when the data was collected.

##### **Type**

String

##### **Source**

The source for this attribute is the agent.

##### **Warehouse name**

TIMESTAMP

**Query Name attribute: This attribute is a key attribute.**

##### **Description**

The name of the attribute group.

##### **Type**

String

##### **Warehouse name**

QUERY\_NAME or ATTRGRP

#### **Object Name attribute**

##### **Description**

The name of the performance object.

##### **Type**

String

##### **Warehouse name**

OBJECT\_NAME or OBJNAME

#### **Object Type attribute**

##### **Description**

The type of the performance object.

##### **Type**

Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- WMI (0)
- PERFMON (1)
- WMI ASSOCIATION GROUP (2)
- JMX (3)
- SNMP (4)
- SHELL COMMAND (5)
- JOINED GROUPS (6)
- CIMOM (7)
- CUSTOM (8)

- ROLLUP DATA (9)
- WMI REMOTE DATA (10)
- LOG FILE (11)
- JDBC (12)
- CONFIG DISCOVERY (13)
- NT EVENT LOG (14)
- FILTER (15)
- SNMP EVENT (16)
- PING (17)
- DIRECTOR DATA (18)
- DIRECTOR EVENT (19)
- SSH REMOTE SHELL COMMAND (20)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

OBJECT\_TYPE or OBJTYPE

**Object Status attribute**

**Description**

The status of the performance object.

**Type**

Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- ACTIVE (0)
- INACTIVE (1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

OBJECT\_STATUS or OBJSTTS

**Error Code attribute**

**Description**

The error code that is associated with the query.

**Type**

Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NO ERROR (0)
- GENERAL ERROR (1)
- OBJECT NOT FOUND (2)
- COUNTER NOT FOUND (3)
- NAMESPACE ERROR (4)
- OBJECT CURRENTLY UNAVAILABLE (5)
- COM LIBRARY INIT FAILURE (6)
- SECURITY INIT FAILURE (7)
- PROXY SECURITY FAILURE (9)
- NO INSTANCES RETURNED (10)
- ASSOCIATOR QUERY FAILED (11)
- REFERENCE QUERY FAILED (12)
- NO RESPONSE RECEIVED (13)
- CANNOT FIND JOINED QUERY (14)
- CANNOT FIND JOIN ATTRIBUTE IN QUERY 1 RESULTS (15)
- CANNOT FIND JOIN ATTRIBUTE IN QUERY 2 RESULTS (16)
- QUERY 1 NOT A SINGLETON (17)
- QUERY 2 NOT A SINGLETON (18)
- NO INSTANCES RETURNED IN QUERY 1 (19)

- NO INSTANCES RETURNED IN QUERY 2 (20)
- CANNOT FIND ROLLUP QUERY (21)
- CANNOT FIND ROLLUP ATTRIBUTE (22)
- FILE OFFLINE (23)
- NO HOSTNAME (24)
- MISSING LIBRARY (25)
- ATTRIBUTE COUNT MISMATCH (26)
- ATTRIBUTE NAME MISMATCH (27)
- COMMON DATA PROVIDER NOT STARTED (28)
- CALLBACK REGISTRATION ERROR (29)
- MDL LOAD ERROR (30)
- AUTHENTICATION FAILED (31)
- CANNOT RESOLVE HOST NAME (32)
- SUBNODE UNAVAILABLE (33)
- SUBNODE NOT FOUND IN CONFIG (34)
- ATTRIBUTE ERROR (35)
- CLASSPATH ERROR (36)
- CONNECTION FAILURE (37)
- FILTER SYNTAX ERROR (38)
- FILE NAME MISSING (39)
- SQL QUERY ERROR (40)
- SQL FILTER QUERY ERROR (41)
- SQL DB QUERY ERROR (42)
- SQL DB FILTER QUERY ERROR (43)
- PORT OPEN FAILED (44)
- ACCESS DENIED (45)
- TIMEOUT (46)
- NOT IMPLEMENTED (47)
- REQUESTED A BAD VALUE (48)
- RESPONSE TOO BIG (49)
- GENERAL RESPONSE ERROR (50)
- SCRIPT NONZERO RETURN (51)
- SCRIPT NOT FOUND (52)
- SCRIPT LAUNCH ERROR (53)
- CONF FILE DOES NOT EXIST (54)
- CONF FILE ACCESS DENIED (55)
- INVALID CONF FILE (56)
- EIF INITIALIZATION FAILED (57)
- CANNOT OPEN FORMAT FILE (58)
- FORMAT FILE SYNTAX ERROR (59)
- REMOTE HOST UNAVAILABLE (60)
- EVENT LOG DOES NOT EXIST (61)
- PING FILE DOES NOT EXIST (62)
- NO PING DEVICE FILES (63)
- PING DEVICE LIST FILE MISSING (64)
- SNMP MISSING PASSWORD (65)
- DISABLED (66)
- URLS FILE NOT FOUND (67)
- XML PARSE ERROR (68)
- NOT INITIALIZED (69)
- ICMP SOCKETS FAILED (70)
- DUPLICATE CONF FILE (71)
- KVM NO DATASOURCES (1000)
- KVM DATASOURCE LOGIN FAILED (1005)
- KVM DATASOURCE NOT FOUND (1010)
- SUBNODE UNAVAILABLE (1033)



- KVM PROVIDER RESET (2222)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

ERROR\_CODE or ERRCODE

**Last Collection Start attribute**

**Description**

The most recent time a data collection of this group started.

**Type**

Timestamp with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NOT COLLECTED (0691231190000000)
- NOT COLLECTED (0000000000000001)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

LAST\_COLLECTION\_START or COLSTR

**Last Collection Finished attribute**

**Description**

The most recent time a data collection of this group finished.

**Type**

Timestamp with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NOT COLLECTED (0691231190000000)
- NOT COLLECTED (0000000000000001)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

LAST\_COLLECTION\_FINISHED or COLFINI

**Last Collection Duration attribute**

**Description**

The duration of the most recently completed data collection of this group in seconds.

**Type**

Real number (32-bit counter) with two decimal places of precision

**Warehouse name**

LAST\_COLLECTION\_DURATION or COLDURA

**Average Collection Duration attribute**

**Description**

The average duration of all data collections of this group in seconds.

**Type**

Real number (32-bit counter) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NO DATA (-100)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

AVERAGE\_COLLECTION\_DURATION or COLAVGD

**Refresh Interval attribute**

**Description**

The interval at which this group is refreshed in seconds.

**Type**

Integer (32-bit counter)

**Warehouse name**

REFRESH\_INTERVAL or REFRINT

**Number of Collections attribute****Description**

The number of times this group has been collected since agent start.

**Type**

Integer (32-bit counter)

**Warehouse name**

NUMBER\_OF\_COLLECTIONS or NUMCOLL

**Cache Hits attribute****Description**

The number of times an external data request for this group was satisfied from the cache.

**Type**

Integer (32-bit counter)

**Warehouse name**

CACHE\_HITS or CACHEHT

**Cache Misses attribute****Description**

The number of times an external data request for this group was not available in the cache.

**Type**

Integer (32-bit counter)

**Warehouse name**

CACHE\_MISSES or CACHEMS

**Cache Hit Percent attribute****Description**

The percentage of external data requests for this group that were satisfied from the cache.

**Type**

Real number (32-bit counter) with two decimal places of precision

**Warehouse name**

CACHE\_HIT\_PERCENT or CACHPCT

**Intervals Skipped attribute****Description**

The number of times a background data collection for this group was skipped because the previous collection was still running when the next one was due to start.

**Type**

Integer (32-bit counter)

**Warehouse name**

INTERVALS\_SKIPPED or INTSKIP

## Resource Pool CPU attribute group

This attribute group contains information about CPU metrics for resource pools.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Resource Pool CPU attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute****Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Server Hostname attribute: This attribute is a key attribute.****Description**

The host name of the ESX server.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVER\_HOSTNAME or SH

**Parent Name attribute: This attribute is a key attribute.****Description**

The name of the parent of this resource pool.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PARENT\_NAME or PN

**Pool Name attribute: This attribute is a key attribute.****Description**

The name of this resource pool.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

POOL\_NAME

**Expandable attribute**

**Description**

Indicates if the CPU reservation is permitted to grow beyond the specified configuration value when the parent resource pool has sufficient unreserved CPU resource.

**Type**

Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Yes (1)
- No (0)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

EXPANDABLE

**Limit attribute****Description**

The configured upper limit of CPU resources in MHz that this resource pool can get even if there are sufficient resources that would otherwise permit the limit to be higher. A value of -1 indicates that there is no limit.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-2)
- No limit (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

LIMIT

**Reservation attribute****Description**

The amount of CPU resource in MHz that is guaranteed to be available to the resource pool.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

RESERVATION or R

**Share Level attribute****Description**

The named level for the defined number of shares. This level corresponds to the Shares attribute.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
SHARE_LEVEL or SL	
<b>Shares attribute</b>	
<b>Description</b>	The relative weighting of CPU allocations given to this resource pool in actual numeric form. This attribute is only applicable when the shares level is defined as custom.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-2)</li> <li>• Not applicable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
SHARES	
<b>Max Usage attribute</b>	
<b>Description</b>	The current upper bound on CPU usage in MHz. This limit is based on the limit that is configured for the resource pool and the limits that are configured for all parent resource pools.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
MAX_USAGE	
<b>CPU Usage attribute</b>	
<b>Description</b>	The CPU usage in MHz of all running child virtual machines including virtual machines in child resource pools.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
CPU_USAGE	
<b>Reservation Used attribute</b>	
<b>Description</b>	The total amount of CPU resources in MHz that have been used to satisfy the reservation requirements of all descendants of this resource pool.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul>

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

RESERVATION\_USED or RU

**Reservation Used VM attribute**

**Description**

The total amount of CPU resources in MHz that have been used to satisfy the reservations of running virtual machines in this resource pool and its descendants.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

RESERVATION\_USED\_VM or RUV

**Unreserved attribute**

**Description**

The total amount of CPU resources in MHz available to satisfy a reservation for child resource pool.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

UNRESERVED

**Unreserved VM attribute**

**Description**

The total amount of CPU resources available in MHz to satisfy a reservation for a child virtual machine.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

UNRESERVED\_VM or UV

**Percent Reserved VMs attribute**

**Description**

The percentage of CPU resources that are reserved for virtual machines.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
PERCENT_RESERVED_VMS or PRV	
<b><u>Percent Overall Usage attribute</u></b>	
<b>Description</b>	The percentage of CPU resources being used relative to the maximum amount currently available.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
PERCENT_OVERALL_USAGE or POU	
<b><u>NodeID attribute</u></b>	
<b>Description</b>	This attribute is only for IBM-internal use.
<b>Type</b>	String
<b>Warehouse name</b>	
NODEID	
<b><u>Include Data In Summarization 0 attribute</u></b>	
<b>Description</b>	This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Value Exceeds Maximum (2147483647)</li> <li>• Value Exceeds Minimum (-2147483648)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Source</b>	The source for this attribute is derived: (Reservation < 0 )    (Shares < 0 )? 0 : 1.
<b>Warehouse name</b>	
INCLUDE_DATA_IN_SUMMARIZATION_0 or IDIS0	
<b><u>Include Data In Summarization 1 attribute</u></b>	
<b>Description</b>	This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Value Exceeds Maximum (2147483647)</li> <li>• Value Exceeds Minimum (-2147483648)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Percent\_Overall\_Usage < 0 ) || (Max\_Usage < 0 ) || (CPU\_Usage < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

**Include Data In Summarization 2 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Reservation\_Used < 0 ) || (Percent\_Reserved\_VMs < 0 ) || (Reservation\_Used\_VM < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_2 or IDIS2

**Include Data In Summarization 3 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Unreserved < 0 ) || (Unreserved\_VM < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_3 or IDIS3

## Resource Pool General attribute group

This attribute group contains information about general metrics and the configuration of resource pools.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Resource Pool General attribute group:

**Node attribute:** This attribute is a key attribute.

**Description**

The managed system name of the agent.

**Type**

String



**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute****Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Server Hostname attribute: This attribute is a key attribute.****Description**

The host name of the ESX server.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVER\_HOSTNAME or SH

**Parent Name attribute: This attribute is a key attribute.****Description**

The name of the parent of this resource pool.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PARENT\_NAME or PN

**Pool Name attribute: This attribute is a key attribute.****Description**

The name of this resource pool.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

POOL\_NAME

**Number VMs attribute****Description**

The number of virtual machines that are children of this resource pool including virtual machines in child resource pools.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_VMS

**Number VMs On attribute****Description**

The number of virtual machines that are children of this resource pool including virtual machines in child resource pools that are powered on.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_VMS\_ON or NVO

**Number Child Pools attribute****Description**

The number of resource pools that are immediate children of this resource pool.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_CHILD\_POOLS or NCP

**CPU Usage attribute****Description**

The CPU usage in MHz of all running child virtual machines including virtual machines in child resource pools.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_USAGE

**Memory Usage attribute****Description**

The memory usage in MB of all running child virtual machines including virtual machines in child resource pools.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the

Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MEMORY\_USAGE or MU

**Overall Status attribute**

**Description**

The overall status indication of this resource pool.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

STATUS

**NodeID attribute**

**Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

**Include Data In Summarization 0 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Number\_VMs < 0 ) || (Number\_VMs\_On < 0 ) || (Number\_Child\_Pools < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

**Include Data In Summarization 1 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)

- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (CPU\_Usage < 0)? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

**Include Data In Summarization 2 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Memory\_Usage < 0)? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_2 or IDIS2

## Resource Pool Memory attribute group

This attribute group contains information about memory metrics for resource pools.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Resource Pool Memory attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Server Hostname attribute: This attribute is a key attribute.**

**Description**

The host name of the ESX server.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVER\_HOSTNAME or SH

**Parent Name attribute: This attribute is a key attribute.**

**Description**

The name of the parent of this resource pool.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PARENT\_NAME or PN

**Pool Name attribute: This attribute is a key attribute.**

**Description**

The name of this resource pool.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

POOL\_NAME

**Expandable attribute**

**Description**

Indicates if the memory reservation is permitted to grow beyond the specified configuration value when the parent resource pool has sufficient unreserved CPU resource.

**Type**

Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Yes (1)
- No (0)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

EXPANDABLE

**Limit attribute**

**Description**

The configured upper limit of memory resources in MB that this resource pool can get even if there are sufficient resources that would otherwise permit the limit to be higher. A value of -1 indicates that there is no limit.

<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-2)</li> <li>• No limit (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	LIMIT
<b><u>Reservation attribute</u></b>	
<b>Description</b>	The amount of memory resource in MB that is guaranteed to be available to the resource pool.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	RESERVATION or R
<b><u>Share Level attribute</u></b>	
<b>Description</b>	The named level for the defined number of shares. This value corresponds to the Shares attribute.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	SHARE_LEVEL or SL
<b><u>Shares attribute</u></b>	
<b>Description</b>	The relative weighting of memory allocations given to this resource pool. This attribute is applicable only when the shares level is defined as custom.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-2)</li> <li>• Not applicable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	SHARES
<b><u>Max Usage attribute</u></b>	

**Description**

The current upper bound on memory usage in MB. This value is based on the limit configured for this resource pool and the limits configured for all parent resource pools.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MAX\_USAGE

**Memory Usage attribute****Description**

The memory usage in MB of all running child virtual machines including virtual machines in child resource pools.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MEMORY\_USAGE or MU

**Reservation Used attribute****Description**

The total amount of memory resources in MB that have been used to satisfy the reservation requirements of all descendants of this resource pool.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

RESERVATION\_USED or RU

**Reservation Used VM attribute****Description**

The total amount of memory resources in MB that have been used to satisfy the reservations of running virtual machines in this resource pool and its descendants.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

RESERVATION\_USED\_VM or RUV

**Unreserved attribute**

**Description**

The total amount of memory resources in MB available to satisfy a reservation for a child resource pool.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

UNRESERVED

**Unreserved VM attribute****Description**

The total amount of memory resources available in MB to satisfy a reservation for a child virtual machine.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

UNRESERVED\_VM or UV

**Percent Reserved VMs attribute****Description**

The percentage of memory resources that are reserved for virtual machines.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PERCENT\_RESERVED\_VMS or PRV

**Percent Overall Usage attribute****Description**

The percentage of memory resources being used relative to the maximum amount currently available.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PERCENT\_OVERALL\_USAGE or POU

**NodeID attribute****Description**

This attribute is only for IBM-internal use.



**Type**

String

**Warehouse name**

NODEID

**Include Data In Summarization 0 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Limit < 0 ) || (Reservation < 0 ) || (Shares < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

**Include Data In Summarization 1 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Memory\_Usage < 0 ) || (Max\_Usage < 0 ) || (Percent\_Overall\_Usage < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

**Include Data In Summarization 2 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Reservation\_Used < 0 ) || (Reservation\_Used\_VM < 0 ) || (Percent\_Reserved\_VMs < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_2 or IDIS2

**Include Data In Summarization 3 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Unreserved < 0 ) || (Unreserved\_VM < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_3 or IDIS3

## Server attribute group

This attribute group contains basic information about an ESX server.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Server attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute****Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Server Hostname attribute: This attribute is a key attribute.**

**Description**

The host name of the ESX server.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVER\_HOSTNAME or SH

**System Up Time attribute**

**Description**

The number of seconds since the server was started.

**Type**

DEFAULT with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SYSTEM\_UP\_TIME or SUT

**Connection State attribute**

**Description**

The connection state of the server.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CONNECTION\_STATE or CS

**Product attribute**

**Description**

The VMware product string for the installed level of ESX.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PRODUCT

**Build number attribute**

**Description**

The VMware product build number for the installed level of ESX.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

BUILD\_NUMBER or BN

### Version attribute

#### **Description**

The VMware product version for the installed level of ESX.

#### **Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

VERSION

### vMotion enabled attribute

#### **Description**

A flag to indicate whether vMotion is configured on this server.

#### **Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

VMOTION\_ENABLED or VE

### Overall Status attribute

#### **Description**

An indicator of the overall status of the server.

#### **Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

OVERALL\_STATUS or OS

### Number VMs attribute

#### **Description**

The number of virtual machines configured on this server.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

NUMBER\_VMS

### Number VMs On attribute

#### **Description**

The number of virtual machines configured on this server that are powered on.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the

Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_VMS\_ON or NVO

**Physical CPUs attribute**

**Description**

The number of physical CPUs on this server.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PHYSICAL\_CPUS or PC

**NICs attribute**

**Description**

The number of NIC interfaces on this server.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NICS

**Physical Memory attribute**

**Description**

The amount of physical memory on this server in MB.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PHYSICAL\_MEMORY or PM

**Overall CPU Util attribute**

**Description**

The overall CPU usage of the server.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
OVERALL_CPU_UTIL or OCU	
<b>Overall Memory Util attribute</b>	
<b>Description</b>	The overall memory usage of the server.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
OVERALL_MEMORY_UTIL or OMU	
<b>Average VM CPU Percent Ready attribute</b>	
<b>Description</b>	The average of all CPU percent ready values for all the virtual machines on this ESX server.
<b>Type</b>	<p>Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
AVG_VM_CPU_PERCENT_RDY or AVCPR	
<b>UUID attribute</b>	
<b>Description</b>	The UUID of the server.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
UUID	
<b>Datacenter attribute</b>	
<b>Description</b>	The name of the data center for this server.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
DATACENTER	
<b>Datacenter MOREf attribute</b>	

**Description**

The internal managed object reference name of the data center for this server.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER\_MOREF or DM

**Total CPU MHz attribute****Description**

The total amount of the CPU of the server in MHz.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TOTAL\_CPU\_MHZ or TCM

**Cluster attribute****Description**

The name of the cluster that this server is a member of or unavailable if not a member of any cluster.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CLUSTER

**Datastore Space attribute****Description**

The total capacity in GB of the data stores connected to this server. This is across all of the data stores that this server is configured to use.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATASTORE\_SPACE or DS

**Datastore Used attribute****Description**

The total amount of datastore storage in GB that is actually in use by this server. This is across all of the data stores that this server is configured to use.

**Type**  
Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
USED\_DATASTORE or UD

#### Maintenance Mode attribute

**Description**  
Whether this server is in maintenance mode.

**Type**  
Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)
- No (0)
- Yes (1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
MAINTENANCE\_MODE or MM

#### NodeID attribute

**Description**  
This attribute is only for IBM-internal use.

**Type**  
String

**Warehouse name**  
NODEID

#### Total VM Configured Memory attribute

**Description**  
The total amount of memory in GB configured for all VMs on this server,

**Type**  
Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
TOTAL\_VM\_CONFIGURED\_MEMORY or TVCM

#### Total VM Provisioned Space attribute

**Description**  
The total amount of space in GB, that has been provisioned for use by VMs on this server.

**Type**  
Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)



Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TOTAL\_VM\_PROVISIONED\_SPACE or TVPS

**Fully Qualified Name attribute**

**Description**

This host's fully qualified name.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

FULLY\_QUALIFIED\_NAME or FQN

**CPU Packages attribute**

**Description**

The number of CPU packages for this host.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_PACKAGES or CP

**Processor Family attribute**

**Description**

The processor family of this host's CPUs.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PROCESSOR\_FAMILY or PF

**System Vendor attribute**

**Description**

The system vendor of this host.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SYSTEM\_VENDOR or SV

**System Model attribute**

**Description**

The system model of this host.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SYSTEM\_MODEL or SM

**BIOS Date attribute****Description**

The date of release for this system's BIOS.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

BIOS\_DATE

**HyperThreading Enabled attribute****Description**

Whether hyperthreading is enabled on this server.

**Type**

Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Yes (1)
- No (0)
- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

HYPERTHREADING\_ENABLED or HE

**Performance Error Rate attribute****Description**

The error rate of performance monitoring API calls against this host over a configured interval.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PERFORMANCE\_ERROR\_RATE or PER

**Performance Error Pct attribute****Description**

The percentage of performance monitoring API calls against this host that failed during their last execution.

	<b>Type</b>	Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
	<b>Warehouse name</b>	PERFORMANCE_ERROR_PCT or PEP
	<b><u>Latency attribute</u></b>	
	<b>Description</b>	The amount of time (in percentage) that the resource pool waits in the ready state and is not scheduled because of a CPU resource contention.
	<b>Type</b>	Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
	<b>Warehouse name</b>	LATENCY
	<b><u>Demand attribute</u></b>	
	<b>Description</b>	The average active CPU load (in MHz) for the last minute.
	<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
	<b>Warehouse name</b>	DEMAND
	<b><u>Used CPU MHz attribute</u></b>	
	<b>Description</b>	The amount of the CPU (in MHz) that is used by the server.
	<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
	<b>Warehouse name</b>	USED_CPU_MHZ or UCM
	<b><u>Energy Usage attribute</u></b>	
	<b>Description</b>	The amount of energy (in joules) that is used since the host system was started.
	<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the

Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

ENERGY\_USAGE or EU

**Power Usage attribute**

**Description**

The amount of power (in watts) that is currently used.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

POWER\_USAGE or PU

**Power Capacity attribute**

**Description**

The maximum amount of power (in watts) that can be used.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

POWER\_CAPACITY or PC0

**IP Address attribute**

**Description**

The IP address of the host system.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

IP\_ADDRESS

**Serial Number attribute**

**Description**

The serial number of the hardware of the host system.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
SERIAL_NUMBER or SN	
<b><u>Storage Adapter Max Latency attribute</u></b>	
<b>Description</b>	The highest latency (in milliseconds) across all the storage adapters that are used by the host.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
STORAGE_ADAPTER_MAX_LATENCY or SAML	
<b><u>Storage Path Max Latency attribute</u></b>	
<b>Description</b>	The highest latency (in milliseconds) across all the storage paths that are used by the host.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
STORAGE_PATH_MAX_LATENCY or SPML	
<b><u>Power State attribute</u></b>	
<b>Description</b>	The power status of the host system. The valid values are POWERED_OFF, POWERED_ON, STAND_BY, and UNKNOWN.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
POWER_STATE or PS	
<b><u>Current EVC Mode attribute</u></b>	
<b>Description</b>	The current Enhanced VMotion Compatibility (EVC) mode of the host system.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
CURRENT_EVC_MODE or CEM	
<b><u>Max EVC Mode attribute</u></b>	

**Description**

The maximum Enhanced VMotion Compatibility (EVC) mode of the host system.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MAX\_EVC\_MODE or MEM

**Include Data In Summarization 0 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Number\_VMs < 0) || (Number\_VMs\_On < 0)? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

**Include Data In Summarization 1 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (NICs < 0) || (Physical\_CPUs < 0) || (CPU\_Packages < 0) || (Physical\_Memory < 0)? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

**Include Data In Summarization 2 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the

Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Overall\_CPU\_Util < 0 ) || (Total\_CPU\_MHz < 0 ) || (Avg\_VM\_CPU\_Percent\_Rdy < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_2 or IDIS2

**Include Data In Summarization 3 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Datastore\_Space < 0 ) || (Used\_Datastore < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_3 or IDIS3

**Include Data In Summarization 4 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Latency < 0 ) || (Demand < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_4 or IDIS4

**Include Data In Summarization 5 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the

Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Energy\_Usage < 0 ) || (Power\_Usage < 0 ) || (Power\_Capacity < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_5 or IDIS5

**Include Data In Summarization 6 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Overall\_Memory\_Util < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_6 or IDIS6

**Include Data In Summarization 7 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Total\_VM\_Configured\_Memory < 0 ) || (Total\_VM\_Provisioned\_Space < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_7 or IDIS7

**Include Data In Summarization 8 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the



Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Storage\_Adapter\_Max\_Latency < 0 ) || (Storage\_Path\_Max\_Latency < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_8 or IDIS8

**Include Data In Summarization 9 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Used\_CPU\_MHz < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_9 or IDIS9

## Server CPU attribute group

This attribute group contains information about CPU usage for a server.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Server CPU attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Server Hostname attribute: This attribute is a key attribute.**

**Description**

The host name of the ESX server.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVER\_HOSTNAME or SH

**CPU Number attribute: This attribute is a key attribute.****Description**

The number of this CPU.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_NUMBER

**CPU Utilization attribute****Description**

The usage of this CPU.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_UTILIZATION or CU

**NodeID attribute****Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

**Core Utilization attribute****Description**

The percentage of the CPU core that is currently utilized. A core is utilized if either a single or both the logical CPU cores are utilized when hyper-threading is enabled.

**Type**

Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CORE\_UTILIZATION or CU0

**Include Data In Summarization 0 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (CPU\_Utilization < 0)? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

**Include Data In Summarization 1 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Core\_Utilization < 0)? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

## Server DataStore attribute group

This attribute group contains information about data stores for a server.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Server DataStore attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

<b>Warehouse name</b>	
NODE	
<b><u>Timestamp attribute</u></b>	
<b>Description</b>	The local time at the agent when the data was collected.
<b>Type</b>	String
<b>Source</b>	The source for this attribute is the agent.
<b>Warehouse name</b>	
TIMESTAMP	
<b><u>Server Hostname attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The host name of the ESX server.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
SERVER_HOSTNAME or SH	
<b><u>Name attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The name of the data store.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
NAME	
<b><u>Free Space attribute</u></b>	
<b>Description</b>	The amount of available storage in MB.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
FREE_SPACE	
<b><u>Used Space attribute</u></b>	
<b>Description</b>	The amount of allocated storage in MB.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

USED\_SPACE

**Maximum File Size attribute**

**Description**

The maximum size in KB of a file that might be allocated.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)
- > 2048GB (-2)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MAXIMUM\_FILE\_SIZE or MFS

**Capacity attribute**

**Description**

The storage capacity in MB. This metric does not apply to floppy or CD drives.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CAPACITY

**Percent Used attribute**

**Description**

The percentage of used space in the data store.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PERCENT\_USED or PU

**Percent Free attribute**

**Description**

The percentage of unused space in this data store.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
PERCENT_FREE or PF	
<b>Type attribute</b>	
<b>Description</b>	The file system type of this data store: NFS or VMFS.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
TYPE	
<b>Datastore MOREf attribute</b>	
<b>Description</b>	The internal managed object reference name of this datastore.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
DATASTORE_MOREF or DM	
<b>Datacenter attribute: This attribute is a key attribute.</b>	
<b>Description</b>	The name of this datacenter.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
DATACENTER	
<b>Overall Status attribute</b>	
<b>Description</b>	The overall status for this alarm.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
OVERALL_STATUS or OS	
<b>NodeID attribute</b>	
<b>Description</b>	This attribute is only for IBM-internal use.

<b>Type</b>	String
<b>Warehouse name</b>	NODEID
<b><u>Read Latency attribute</u></b>	
<b>Description</b>	The average amount of time (in milliseconds) taken for a read operation from the datastore.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	READ_LATENCY or RL
<b><u>Write Latency attribute</u></b>	
<b>Description</b>	The average amount of time (in milliseconds) taken for a write operation from the datastore.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	WRITE_LATENCY or WL
<b><u>Include Data In Summarization 0 attribute</u></b>	
<b>Description</b>	This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Value Exceeds Maximum (2147483647)</li> <li>• Value Exceeds Minimum (-2147483648)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Source</b>	The source for this attribute is derived: (Free_Space < 0 )    (Used_Space < 0 )    (Percent_Used < 0 )    (Percent_Free < 0 )? 0 : 1.
<b>Warehouse name</b>	INCLUDE_DATA_IN_SUMMARIZATION_0 or IDIS0
<b><u>Include Data In Summarization 1 attribute</u></b>	
<b>Description</b>	This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**  
Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**  
The source for this attribute is derived:  $(\text{Read\_Latency} < 0) \vee (\text{Write\_Latency} < 0) ? 0 : 1$ .

**Warehouse name**  
INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

## Server Disk attribute group

This attribute group contains information about disk usage for a server.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the Server Disk attribute group:

**Node attribute:** This attribute is a key attribute.

**Description**  
The managed system name of the agent.

**Type**  
String

**Source**  
The source for this attribute is the agent.

**Warehouse name**  
NODE

**Timestamp attribute**

**Description**  
The local time at the agent when the data was collected.

**Type**  
String

**Source**  
The source for this attribute is the agent.

**Warehouse name**  
TIMESTAMP

**Server Hostname attribute:** This attribute is a key attribute.

**Description**  
The host name of the ESX server.

**Type**  
String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
SERVER\_HOSTNAME or SH

**Disk Name attribute:** This attribute is a key attribute.

**Description**  
The name of a virtual disk on the server.



<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	DISK_NAME
<b><u>Read attribute</u></b>	
<b>Description</b>	The amount of data read in the interval for this disk in KBps.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	READ
<b><u>Write attribute</u></b>	
<b>Description</b>	The amount of data written in the interval for this disk in KB per second.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	WRITE
<b><u>Number Read attribute</u></b>	
<b>Description</b>	The number of read operations on the disk in the performance interval.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	NUMBER_READ or NR
<b><u>Number Write attribute</u></b>	
<b>Description</b>	The number of write operations on the disk in the performance interval.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (-1)</li> </ul>

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_WRITE or NW

**BUS Resets attribute**

**Description**

The number of bus resets in the performance interval.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

BUS\_RESETS

**Commands attribute**

**Description**

The number of disk commands issued during the performance interval.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

COMMANDS

**Commands Aborted attribute**

**Description**

The number of disk commands stopped during the performance interval.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

COMMANDS\_ABORTED or CA

**Device Latency attribute**

**Description**

The average amount of time in milliseconds to complete an operation by the physical device.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DEVICE\_LATENCY or DL

**Device Read Latency attribute**

**Description**

The average amount of time in milliseconds that a read operation took by the physical device.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DEVICE\_READ\_LATENCY or DRL

**Device Write Latency attribute****Description**

The average amount of time in milliseconds that a write operation took by the physical device.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DEVICE\_WRITE\_LATENCY or DWL

**Device Total Latency attribute****Description**

The sum of the average amount of time in milliseconds to complete read and write operations by the physical device.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DEVICE\_TOTAL\_LATENCY or DTL

**Kernel Latency attribute****Description**

The average amount of time in milliseconds to complete an operation by the VMware kernel.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

KERNEL\_LATENCY or KL

**Kernel Read Latency attribute**

**Description**

The average amount of time in milliseconds that a read operation took by the VMware kernel.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

KERNEL\_READ\_LATENCY or KRL

**Kernel Write Latency attribute****Description**

The average amount of time in milliseconds that a write operation took by the VMware kernel.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

KERNEL\_WRITE\_LATENCY or KWL

**Kernel Total Latency attribute****Description**

The sum of the average amount of time in milliseconds to complete read and write an operations by the VMware kernel.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

KERNEL\_TOTAL\_LATENCY or KTL

**Queue Latency attribute****Description**

The average amount of time in milliseconds spent in the queue for the VMware kernel per IO command.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

QUEUE\_LATENCY or QL

**Queue Read Latency attribute**

**Description**

The average amount of time in milliseconds that a read operation spent in the queue for the VMware kernel.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

QUEUE\_READ\_LATENCY or QRL

**Queue Write Latency attribute****Description**

The average amount of time in milliseconds that a write operation spent in the queue for the VMware kernel.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

QUEUE\_WRITE\_LATENCY or QWL

**Queue Total Latency attribute****Description**

The sum of the average amount of time in milliseconds spent in the queue for reads and writes in the VMware kernel per IO command.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

QUEUE\_TOTAL\_LATENCY or QTL

**Total Read Latency attribute****Description**

The average total amount of time in milliseconds spent on a read operation for both the physical and kernel layers.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TOTAL\_READ\_LATENCY or TRL

**Total Write Latency attribute**

**Description**

The average total amount of time in milliseconds spent on a write operation for both the physical and kernel layers.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TOTAL\_WRITE\_LATENCY or TWL

**Total Latency attribute****Description**

The average total amount of time spent on an IO operation for both the physical and kernel layers.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TOTAL\_LATENCY or TL

**Backing Datastore attribute****Description**

The name of the data store that backs this server disk if there is one.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Not Applicable (Not Applicable)
- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

BACKING\_DATASTORE or BD

**NodeID attribute****Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

**Include Data In Summarization 0 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Read < 0 ) || (Write < 0 ) || (Number\_Read < 0 ) || (Number\_Write < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

**Include Data In Summarization 1 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Device\_Latency < 0 ) || (Device\_Total\_Latency < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

**Include Data In Summarization 2 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Kernel\_Latency < 0 ) || (Kernel\_Total\_Latency < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_2 or IDIS2

**Include Data In Summarization 3 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived:  $(Queue\_Latency < 0) \vee (Queue\_Total\_Latency < 0) ? 0 : 1$ .

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_3 or IDIS3

**Include Data In Summarization 4 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived:  $(Total\_Read\_Latency < 0) \vee (Device\_Read\_Latency < 0) \vee (Kernel\_Read\_Latency < 0) ? 0 : 1$ .

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_4 or IDIS4

**Include Data In Summarization 5 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived:  $(Total\_Write\_Latency < 0) \vee (Device\_Write\_Latency < 0) \vee (Kernel\_Write\_Latency < 0) ? 0 : 1$ .

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_5 or IDIS5

**Include Data In Summarization 6 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:



- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Total\_Latency < 0 ) || (Queue\_Read\_Latency < 0 ) || (Queue\_Write\_Latency < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_6 or IDIS6

## Server HBA attribute group

This attribute group contains information about the host bus adapters (HBA) of the server.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Server HBA attribute group:

**Node attribute:** This attribute is a key attribute.

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Server Hostname attribute:** This attribute is a key attribute.

**Description**

The host name of the ESX server.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVER\_HOSTNAME or SH

**Bus attribute**

**Description**

The bus number of this HBA.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

BUS

**Device attribute: This attribute is a key attribute.**

**Description**

The device name of this HBA.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DEVICE

**Driver attribute**

**Description**

The driver being used for this HBA.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DRIVER

**Model attribute**

**Description**

The model string for this HBA.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MODEL

**PCI ID attribute**

**Description**

The PCI ID for this HBA.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PCI\_ID

**Status attribute**

**Description**

The operational status for this HBA.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

STATUS

**NodeID attribute****Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

**Read attribute****Description**

The average amount of data that is read (in KB per second) by the storage adapter.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

READ

**Write attribute****Description**

The average amount of data that is written (in KB per second) by the storage adapter.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

WRITE

**Read Latency attribute****Description**

The average amount of time (in milliseconds) over a given sample interval that the storage adapter consumes for a read operation to complete. This average amount of time is the sum of kernel latency and device latency.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

READ\_LATENCY or RL

**Write Latency attribute**

**Description**

The average amount of time (in milliseconds) over a given sample interval that the storage adapter consumes for a write operation to complete. This average amount of time is the sum of kernel latency and device latency.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

WRITE\_LATENCY or WL

**Speed attribute**

**Description**

The current operating speed (in KB per second) of the adapter. This attribute is available for the HostFibreChannelHba HBA type.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SPEED

**Current Link Speed attribute**

**Description**

The current operating link speed (in megabits per second) of the port. This attribute is available for the HostInternetScsiHba HBA type.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CURRENT\_LINK\_SPEED or CLS

**Max Link Speed attribute**

**Description**

The maximum supported link speed (in megabits per second) of the port. This attribute is available for the HostInternetScsiHba HBA type.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MAX\_LINK\_SPEED or MLS

**Storage Adapter Throughput Usage attribute**

**Description**

The I/O rate (in KB per second) of the storage adapter.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

STORAGE\_ADAPTER\_THROUGHPUT\_USAGE or SATU

**HBA Type attribute**

**Description**

The type of Host Bus Adapter (HBA). The valid values are HostBlockHba, HostFibreChannelHba, HostInternetScsiHba, and HostParallelScsiHba.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

HBA\_TYPE

**Include Data In Summarization 0 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Read < 0 ) || (Write < 0 ) || (Read\_Latency < 0 ) || (Write\_Latency < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

**Include Data In Summarization 1 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the

Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Speed < 0 ) || (Current\_Link\_Speed < 0 ) || (Max\_Link\_Speed < 0 ) || (Storage\_Adapter\_Throughput\_Usage < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

## Server Health attribute group

This attribute group contains ESX server health information.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Server Health attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Server Hostname attribute: This attribute is a key attribute.**

**Description**

The host name of the ESX server.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVER\_HOSTNAME or SH

**Sensor Type attribute**

**Description**

The type of sensor.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise

Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
SENSOR\_TYPE or ST

#### **Sensor Name attribute**

**Description**  
The name of the sensor.

**Type**  
String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
SENSOR\_NAME or SN

#### **Sensor Status attribute**

**Description**  
The operational status of the sensor.

**Type**  
String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
SENSOR\_STATUS or SS

#### **Sensor Value attribute**

**Description**  
The value of the sensor.

**Type**  
Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-2147483648)
- Not applicable (-2147483647)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
SENSOR\_VALUE or SV

#### **Sensor Units attribute**

**Description**  
The units of Sensor\_Value.

**Type**  
String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)
- Not applicable (Not applicable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SENSOR\_UNITS or SU

**NodeID attribute**

**Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

## Server Memory attribute group

This attribute group contains information about memory usage for a server.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Server Memory attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Server Hostname attribute: This attribute is a key attribute.**

**Description**

The host name of the ESX server.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVER\_HOSTNAME or SH

**Physical Memory attribute**

**Description**

The amount of physical memory in MB on this server.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the



Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PHYSICAL\_MEMORY or PM

**Memory Usage attribute**

**Description**

The amount of physical memory in use in MB.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MEMORY\_USAGE or MU

**Service Console attribute**

**Description**

The amount of memory reserved by the service console for the server in KB.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVICE\_CONSOLE or SC

**Memory Utilization attribute**

**Description**

The physical memory usage as a percentage of used physical memory divided by physical memory installed.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MEMORY\_UTILIZATION or MU0

**Active Memory attribute**

**Description**

The amount of memory that is actively used in KB.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

ACTIVE\_MEMORY or AM

**Granted Memory attribute**

**Description**

The amount of memory available for use in KB.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

GRANTED\_MEMORY or GM

**Swap Used attribute**

**Description**

The amount of memory used for swap space in KB.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SWAP\_USED

**Free Memory attribute**

**Description**

The amount of physical memory that is currently free in MB.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

FREE\_MEMORY or FM

**Balloon Used attribute**

**Description**

The amount of memory used by the virtual machine memory control system in KB.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

BALLOON\_USED or BU

**Swap In Rate attribute**

**Description**

The rate at which memory is swapped in in kilobytes per second.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SWAP\_IN\_RATE or SIR

**Swap Out Rate attribute****Description**

The rate at which memory is swapped out in kilobytes per second.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SWAP\_OUT\_RATE or SOR

**Swap Total Rate attribute****Description**

The total rate at which memory is swapped in or out in kilobytes per second.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SWAP\_TOTAL\_RATE or STR

**NodeID attribute****Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

**Active Write attribute****Description**

The amount of memory (in KB) that is written to disk.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

ACTIVE\_WRITE or AW

### **Swap In Rate From Host Cache attribute**

#### **Description**

The rate (in KB per second) at which the memory is swapped from the host cache to the active memory.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

SWAP\_IN\_RATE\_HOST\_CACHE or SIRHC

### **Swap Out Rate From Host Cache attribute**

#### **Description**

The rate (in KB per second) at which the memory is swapped from the active memory to the host cache.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

SWAP\_OUT\_RATE\_HOST\_CACHE or SORHC

### **Low Free Threshold attribute**

#### **Description**

The threshold of the free host physical memory (in KB). The ESX server starts recovering the memory from the virtual machines by using ballooning and swapping when the threshold is reached.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

LOW\_FREE\_THRESHOLD or LFT

### **Granted Max Memory attribute**

#### **Description**

The maximum amount of memory (in KB) that can be used by the virtual machine.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

GRANTED\_MAX\_MEMORY or GMM

### **Granted Min Memory attribute**

**Description**

The minimum amount of memory (in KB) that can be used by the virtual machine.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

GRANTED\_MIN\_MEMORY or GMM0

**Include Data In Summarization 0 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Memory\_Utilization < 0 ) || (Active\_Memory < 0 ) || (Granted\_Memory < 0 ) || (Swap\_Used < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

**Include Data In Summarization 1 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Swap\_In\_Rate < 0 ) || (Swap\_Out\_Rate < 0 ) || (Swap\_Total\_Rate < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

**Include Data In Summarization 2 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Active\_Write < 0 ) || (Low\_Free\_Threshold < 0 ) || (Granted\_Max\_Memory < 0 ) || (Balloon\_Used < 0 ) || (Granted\_Min\_Memory < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_2 or IDIS2

**Include Data In Summarization 3 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Memory\_Usage < 0 ) || (Free\_Memory < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_3 or IDIS3

**Include Data In Summarization 4 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Swap\_In\_Rate\_Host\_Cache < 0 ) || (Swap\_Out\_Rate\_Host\_Cache < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_4 or IDIS4

## Server Network attribute group

This attribute group contains information about network usage for a server.

## Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

## Attribute descriptions

The following list contains information about each attribute in the Server Network attribute group:

**Node attribute:** This attribute is a key attribute.

### Description

The managed system name of the agent.

### Type

String

### Source

The source for this attribute is the agent.

### Warehouse name

NODE

**Timestamp attribute**

### Description

The local time at the agent when the data was collected.

### Type

String

### Source

The source for this attribute is the agent.

### Warehouse name

TIMESTAMP

**Server Hostname attribute:** This attribute is a key attribute.

### Description

The host name of the ESX server.

### Type

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

### Warehouse name

SERVER\_HOSTNAME or SH

**NIC Name attribute:** This attribute is a key attribute.

### Description

The name or label of this network interface.

### Type

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

### Warehouse name

NIC\_NAME

**Usage attribute**

### Description

The sum of data transmitted and received in the performance interval in KB per second.

### Type

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

USAGE

**Transmitted attribute**

**Description**

The amount of data transmitted in the performance interval in KB per second.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TRANSMITTED or T

**Received attribute**

**Description**

The amount of data received in the performance interval in KB per second.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

RECEIVED

**Pkts Received attribute**

**Description**

The number of packets received in the performance interval.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PKTS\_RECEIVED or PR

**Pkts Transmitted attribute**

**Description**

The number of packets transmitted in the performance interval.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PKTS\_TRANSMITTED or PT



**Status attribute****Description**

The current status, up or down, of the NIC.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

STATUS

**Link Speed attribute****Description**

The current operating speed of the NIC in MB per second (mbps).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

LINK\_SPEED

**Duplex attribute****Description**

The current operating mode of the NIC.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DUPLEX

**Switch attribute****Description**

The name of the virtual switch that the NIC is configured with.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VIRTUAL\_SWITCH or VS

**Link Utilization attribute****Description**

The percent usage of the NIC relative to the capacity of the link (including duplex).

**Type**

Real number (32-bit gauge) with two decimal places of precision with

enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

LINK\_UTILIZATION or LU

**NodeID attribute**

**Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

**Datacenter attribute**

**Description**

The name of the data center this ESX Server is a member of.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER

**Cluster attribute**

**Description**

The name of the cluster that this ESX server is a member of or unavailable if not a member of any cluster.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CLUSTER

**Transmit Pkts Dropped attribute**

**Description**

The number of transmit packets dropped in the performance interval.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TRANSMIT\_PKTS\_DROPPED or TPD

**Receive Pkts Dropped attribute**

**Description**

The number of receive packets dropped in the performance interval.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

RECEIVE\_PKTS\_DROPPED or RPD

**Pkts Dropped attribute****Description**

The number of packets dropped in the performance interval.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PKTS\_DROPPED or PD

**Physical Address attribute****Description**

The physical address of this NIC.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PHYSICAL\_ADDR or PA

**Include Data In Summarization 0 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Usage < 0 ) || (Transmitted < 0 ) || (Received < 0 ) || (Pkts\_Received < 0 ) || (Pkts\_Transmitted < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

**Include Data In Summarization 1 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived:  $(\text{Link\_Speed} < 0) \mid (\text{Link\_Utilization} < 0)? 0 : 1$ .

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

**Include Data In Summarization 2 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived:  $(\text{Transmit\_Pkts\_Dropped} < 0) \mid (\text{Receive\_Pkts\_Dropped} < 0) \mid (\text{Pkts\_Dropped} < 0)? 0 : 1$ .

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_2 or IDIS2

## Server SAN attribute group

This attribute group contains information about the SAN devices for a server.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Server SAN attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute****Description**

The local time at the agent when the data was collected.

<b>Type</b>	String
<b>Source</b>	The source for this attribute is the agent.
<b>Warehouse name</b>	TIMESTAMP
<b><u>Disk Name attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The name of the disk.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	DISK_NAME
<b><u>Datastore attribute</u></b>	
<b>Description</b>	The name of the associated data store for the disk.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Not applicable (Not applicable)</li> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	DATASTORE
<b><u>Paths attribute</u></b>	
<b>Description</b>	The number of paths the host has to the device.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	PATHS
<b><u>Broken Paths attribute</u></b>	
<b>Description</b>	The number of broken paths the host has to the device.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
BROKEN_PATHS or BP	
<b>Disabled Paths attribute</b>	
<b>Description</b>	The number of disabled paths the host has to the device.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
DISABLED_PATHS or DP	
<b>Path Selection Policy attribute</b>	
<b>Description</b>	The path selection policy the host uses to determine how to access the device.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
PATH_SELECTION_POLICY or PSP	
<b>NodeID attribute</b>	
<b>Description</b>	This attribute is only for IBM-internal use.
<b>Type</b>	String
<b>Warehouse name</b>	NODEID

## Server Virtual Switches attribute group

This attribute group contains information about the virtual switches in the virtual infrastructure.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the Server Virtual Switches attribute group:

**Node attribute: This attribute is a key attribute.**

<b>Description</b>	The managed system name of the agent.
<b>Type</b>	String
<b>Source</b>	The source for this attribute is the agent.
<b>Warehouse name</b>	NODE

### Timestamp attribute

<b>Description</b>	The local time at the agent when the data was collected.
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<b>Type</b>	String
<b>Source</b>	The source for this attribute is the agent.
<b>Warehouse name</b>	TIMESTAMP
<b><u>Datacenter attribute:</u> This attribute is a key attribute.</b>	
<b>Description</b>	The name of the data center that uses this virtual switch.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	DATACENTER
<b><u>Server Hostname attribute:</u> This attribute is a key attribute.</b>	
<b>Description</b>	The host name of the ESX server that the virtual switch belongs to.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	SERVER_HOSTNAME or SH
<b><u>Switch attribute:</u> This attribute is a key attribute.</b>	
<b>Description</b>	The name of the virtual switch.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	SWITCH
<b><u>Network attribute:</u> This attribute is a key attribute.</b>	
<b>Description</b>	The name of the network with which the virtual switch is associated.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	NETWORK

### **Number NICs attribute**

#### **Description**

The number of NICs connected to the virtual switch.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

NUMBER\_OF\_NICS or NON

### **Transmitted attribute**

#### **Description**

The amount of data transmitted in the performance interval in KB per second.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

TRANSMITTED or T

### **Received attribute**

#### **Description**

The amount of data received in the performance interval in KB per second.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

RECEIVED

### **Usage attribute**

#### **Description**

The total usage of the virtual switch.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

USAGE

### **Include Data In Summarization 0 attribute**

#### **Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).



**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Transmitted < 0 ) || (Received < 0 ) || (Usage < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

## Server VM Datastore Utilization attribute group

This attribute group contains information about how each virtual machine is utilizing a data store.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Server VM Datastore Utilization attribute group:

**Node attribute:** This attribute is a key attribute.

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute****Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Name attribute:** This attribute is a key attribute.

**Description**

The name of the data store.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NAME

**DataCenter attribute:** This attribute is a key attribute.

**Description**

The name of the data center that contains this data store.

**Type**  
String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
DATACENTER

#### Virtual Machine attribute

**Description**  
The name of the virtual machine on the data store.

**Type**  
String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
VIRTUAL\_MACHINE or VM

#### Committed attribute

**Description**  
The amount of space in GB, on this data store, that this virtual machine is using.

**Type**  
Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
COMMITTED

#### Uncommitted attribute

**Description**  
The reserved but unused amount of space in GB, on this data store, that this virtual machine can use in the future.

**Type**  
Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
UNCOMMITTED or U

#### Provisioned attribute

**Description**  
The total reserved amount of space in GB, on this data store, that this virtual machine can use.

**Type**  
Real number (32-bit gauge) with three decimal places of precision with

enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PROVISIONED or P

**Unshared attribute**

**Description**

The amount of space in GB, on this data store, occupied by this virtual machine that is not shared with any other virtual machines.

**Type**

Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

UNSHARED

**Percent Committed attribute**

**Description**

The percentage of space on this datastore that is committed as a percentage of the provisioned amount.

**Type**

Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PERCENT\_COMMITTED or PC

**NodeID attribute**

**Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

**Include Data In Summarization 0 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Committed < 0 ) || (Uncommitted < 0 ) || (Provisioned < 0 ) || (Unshared < 0 ) || (Percent\_Committed < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

## SubNode Events attribute group

This attribute group contains events for a server.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the SubNode Events attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Server Hostname attribute: This attribute is a key attribute.**

**Description**

The host name of the ESX server that originated this event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVER\_HOSTNAME or SH

**Event Seq Number attribute: This attribute is a key attribute.**

**Description**

A sequence number for the event.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

EVENT\_SEQ\_NUMBER or ESN

**UserId attribute**

**Description**

The user ID that caused the event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Not applicable (Not applicable)
- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

USERID

**Event Time attribute**

**Description**

The time that the event occurred.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

EVENT\_TIME

**Event attribute**

**Description**

The event data string.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

EVENT

**Compute Resource attribute**

**Description**

The compute resource associated with this event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

COMPUTE\_RESOURCE or CR

**Datacenter attribute**

**Description**

The data center associated with this event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER

**Virtual Machine attribute****Description**

The virtual machine associated with this event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VIRTUAL\_MACHINE or VM

**Virtual Machine UUID attribute****Description**

The UUID of the virtual machine associated with this event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VIRTUAL\_MACHINE\_UUID or VMU

**ESX Server UUID attribute****Description**

The UUID of the ESX server associated with this event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

ESX\_SERVER\_UUID or ESU

**Category attribute****Description**

The severity level associated with the event by VMware.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CATEGORY

**Event Type attribute**

**Description**

The type of event given by VMware.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

EVENT\_TYPE

**Event Text attribute**

**Description**

The full event data string.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

EVENT\_TEXT

**Event Type ID attribute**

**Description**

The type ID of the event given by VMware. This is unavailable unless the event is an extended event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

EVENT\_TYPE\_ID or ETI

**Entity Type attribute**

**Description**

The entity type of the event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	ENTITY_TYPE or ET
<b><u>Include Data In Summarization 0 attribute</u></b>	
<b>Description</b>	This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Value Exceeds Maximum (2147483647)</li> <li>• Value Exceeds Minimum (-2147483648)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Source</b>	The source for this attribute is derived: (Event_Seq_Number < 0 )? 0 : 1.
<b>Warehouse name</b>	INCLUDE_DATA_IN_SUMMARIZATION_0 or IDIS0

## Tasks attribute group

This attribute group provides information about the tasks that are completed on the vCenter server.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the Tasks attribute group:

**Node attribute: This attribute is a key attribute.**

<b>Description</b>	The managed system name of the agent.
<b>Type</b>	String
<b>Source</b>	The source for this attribute is the agent.
<b>Warehouse name</b>	NODE

### **Timestamp attribute**

<b>Description</b>	The local time at the agent when the data was collected.
<b>Type</b>	String
<b>Source</b>	The source for this attribute is the agent.
<b>Warehouse name</b>	TIMESTAMP

**Source Hostname attribute: This attribute is a key attribute.**

<b>Description</b>	The host name of the data source that created the task.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.



<b>Warehouse name</b>	
SOURCE_HOSTNAME or SH	
<b>Name attribute: This attribute is a key attribute.</b>	
<b>Description</b>	The name of the task.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
NAME	
<b>Target Entity attribute</b>	
<b>Description</b>	The name of the target managed entity for the task.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
TARGET_ENTITY or TE	
<b>Status attribute</b>	
<b>Description</b>	The status of the task. The valid values are error and success.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
STATUS	
<b>Initiated By attribute</b>	
<b>Description</b>	The type of the entity that created the task. The valid values are user name, another schedule task name, alarm name, and system.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
INITIATED_BY or IB	
<b>Queue Time attribute</b>	
<b>Description</b>	The date and time when the task was created.

<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	QUEUE_TIME
<b><u>Start Time attribute</u></b>	
<b>Description</b>	The date and time when the task started running.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	START_TIME
<b><u>Completed Time attribute</u></b>	
<b>Description</b>	The date and time when the task was completed.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	COMPLETED_TIME or CT
<b><u>Target Entity Type attribute</u></b>	
<b>Description</b>	The type of the target managed entity for the task.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	TARGET_ENTITY_TYPE or TET
<b><u>Error Message attribute</u></b>	
<b>Description</b>	The reason for the task failure.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul>

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

ERROR\_MESSAGE or EM

## Thread Pool Status attribute group

The Thread Pool Status attribute group contains information that reflects the status of the internal thread pool used to collect data asynchronously.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the Thread Pool Status attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Thread Pool Size attribute**

**Description**

The number of threads currently existing in the thread pool.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NO DATA (-1)
- NO DATA (-100)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

THREAD\_POOL\_SIZE or THPSIZE

**Thread Pool Max Size attribute**

**Description**

The maximum number of threads allowed to exist in the thread pool.

**Type**

Integer (32-bit numeric property) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NO DATA (-1)
- NO DATA (-100)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

THREAD\_POOL\_MAX\_SIZE or TPMAXSZ

**Thread Pool Active Threads attribute**

**Description**

The number of threads in the thread pool currently active doing work.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NO DATA (-1)
- NO DATA (-100)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

THREAD\_POOL\_ACTIVE\_THREADS or TPACTTH

**Thread Pool Avg Active Threads attribute**

**Description**

The average number of threads in the thread pool simultaneously active doing work.

**Type**

Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NO DATA (-1)
- NO DATA (-100)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

THREAD\_POOL\_AVG\_ACTIVE\_THREADS or TPAVGAT

**Thread Pool Min Active Threads attribute**

**Description**

The smallest number of threads in the thread pool that have simultaneously been active doing work.

**Type**

Integer (32-bit counter) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NO DATA (-1)
- NO DATA (-100)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

THREAD\_POOL\_MIN\_ACTIVE\_THREADS or TPMINAT

**Thread Pool Max Active Threads attribute**

**Description**

The peak number of threads in the thread pool that have simultaneously been active doing work.

**Type**

Integer (32-bit counter) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NO DATA (-1)
- NO DATA (-100)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

THREAD\_POOL\_MAX\_ACTIVE\_THREADS or TPMAXAT

**Thread Pool Queue Length attribute**

**Description**

The number of jobs currently waiting in the thread pool queue.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NO DATA (-1)
- NO DATA (-100)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

THREAD\_POOL\_QUEUE\_LENGTH or TPQLGTH

**Thread Pool Avg Queue Length attribute**

**Description**

The average length of the thread pool queue during this run.

**Type**

Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NO DATA (-1)
- NO DATA (-100)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

THREAD\_POOL\_AVG\_QUEUE\_LENGTH or TPAVGQL

**Thread Pool Min Queue Length attribute**

**Description**

The minimum length the thread pool queue has reached.

**Type**

Integer (32-bit counter) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NO DATA (-1)
- NO DATA (-100)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

THREAD\_POOL\_MIN\_QUEUE\_LENGTH or TPMINQL

**Thread Pool Max Queue Length attribute**

**Description**

The peak length the thread pool queue has reached.

**Type**

Integer (32-bit counter) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NO DATA (-1)

- NO DATA (-100)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

THREAD\_POOL\_MAX\_QUEUE\_LENGTH or TPMAXQL

**Thread Pool Avg Job Wait attribute**

**Description**

The average time a job spends waiting on the thread pool queue in seconds.

**Type**

Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NO DATA (-1)
- NO DATA (-100)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

THREAD\_POOL\_AVG\_JOB\_WAIT or TPAVJBW

**Thread Pool Total Jobs attribute**

**Description**

The number of jobs completed by all threads in the pool since agent start.

**Type**

Integer (32-bit counter) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- NO DATA (-1)
- NO DATA (-100)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

THREAD\_POOL\_TOTAL\_JOBS or TPTJOBS

## Topological Events attribute group

This attribute group posts events when ESX servers and virtual machines are created or destroyed, or when virtual machines are relocated using vMotion.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the Topological Events attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

<b>Type</b>	String
<b>Source</b>	The source for this attribute is the agent.
<b>Warehouse name</b>	TIMESTAMP
<b><u>Entity Type attribute</u></b>	
<b>Description</b>	The type of topological entity to which the event applies.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Host System (Host System)</li> <li>• Virtual Machine (Virtual Machine)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	ENTITY_TYPE or ET
<b><u>Event Type attribute</u></b>	
<b>Description</b>	The type of topological event that occurred.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Created (Created)</li> <li>• Destroyed (Destroyed)</li> <li>• Relocated (Relocated)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	EVENT_TYPE
<b><u>Host UUID attribute</u></b>	
<b>Description</b>	The UUID of the host system associated with this event.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	HOST_UUID
<b><u>VM UUID attribute</u></b>	
<b>Description</b>	The UUID of the virtual machine associated with this event.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul>

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_UUID

**Managed System Name attribute**

**Description**

The managed system name associated with this event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MSN

**Name attribute**

**Description**

The name of the virtual machine or host that is producing this topology update.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NAME

**DATASTORE UUID attribute**

**Description**

The Universal Unique ID of the data store that is associated with the event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATASTORE\_UUID or DU

**Server Hostname attribute**

**Description**

The host name of the ESX server that is associated with the event.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVER\_HOSTNAME or SH



## Topology attribute group

This attribute group contains information about the topology of servers and virtual machines.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the Topology attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**NodeName attribute**

**Description**

The name of this node in the tree.

**Type**

String

**Warehouse name**

NODENAME

**NodeID attribute: This attribute is a key attribute.**

**Description**

The identifier for this node in the topology.

**Type**

String

**Warehouse name**

NODEID

**NodeType attribute**

**Description**

The type of node in the tree.

**Type**

String

**Warehouse name**

NODETYPE

**NodeStatus attribute**

**Description**

The status of this node.

**Type**

String

**Warehouse name**

NODESTATUS

**ConnectToNode attribute: This attribute is a key attribute.**

**Description**

Indicates a connection from the NodeID to the node specified here.

<b>Type</b>	String
<b>Warehouse name</b>	CONNECTTONODE or C
<b><u>ConnectionType attribute</u></b>	
<b>Description</b>	The connection type from this node to the parent of this node.
<b>Type</b>	String
<b>Warehouse name</b>	CONNECTIONTYPE or C0
<b><u>Managed System Name attribute</u></b>	
<b>Description</b>	The managed system name that is associated with the data.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	MSN
<b><u>Datacenter attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The name of this data center.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	DATACENTER

## Triggered Alarms attribute group

This attribute group contains information about the alarms in the virtual infrastructure.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the Triggered Alarms attribute group:

**Node attribute: This attribute is a key attribute.**

<b>Description</b>	The managed system name of the agent.
<b>Type</b>	String
<b>Source</b>	The source for this attribute is the agent.
<b>Warehouse name</b>	NODE

### **Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Datacenter attribute: This attribute is a key attribute.**

**Description**

The name of this data center.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER

**Alarm Status attribute**

**Description**

The alarm status for this alarm.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

ALARM\_STATUS or OS

**Alarm Triggered Time attribute**

**Description**

The time that this alarm is triggered.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

ALARM\_TRIGGERED\_TIME or ATT

**Alarm Name attribute: This attribute is a key attribute.**

**Description**

The name of the alarm that got triggered.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	ALARM_NAME
<b><u>Description attribute</u></b>	
<b>Description</b>	The description of this alarm.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	DESCRIPTION or D
<b><u>Triggered Entity attribute</u></b>	
<b>Description</b>	The name of the entity that this alarm was triggered on.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	TRIGGERED_ENTITY or TE
<b><u>Affected Entity attribute</u></b>	
<b>Description</b>	The name of the entity that was affected by this alarm.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	AFFECTED_ENTITY or EN

## vCenters attribute group

This attribute group displays basic information about VMware data sources.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the vCenters attribute group:

**Node attribute: This attribute is a key attribute.**

<b>Description</b>	The managed system name of the agent.
<b>Type</b>	String
<b>Source</b>	The source for this attribute is the agent.
<b>Warehouse name</b>	NODE

### Timestamp attribute

#### Description

The local time at the agent when the data was collected.

#### Type

String

#### Source

The source for this attribute is the agent.

#### Warehouse name

TIMESTAMP

### Configured Address attribute: This attribute is a key attribute.

#### Description

The host address of the data source as entered in the agent data source configuration.

#### Type

String

#### Warehouse name

CONFIGURED\_ADDRESS or CA

### FQDN attribute

#### Description

The fully qualified domain name of the data source.

#### Type

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### Warehouse name

FQDN

### IP Address attribute

#### Description

The IP address of the data source.

#### Type

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### Warehouse name

IP\_ADDRESS

### Web Services Port attribute

#### Description

The port through which the agent communicates with the data source.

#### Type

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### Warehouse name

WEB\_SERVICES\_PORT or WSP

### Agent Connection attribute

**Description**

The current connection status of this agent to the configured data source.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)
- Down (0)
- Up (1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

AGENT\_CONNECTION or AC

**Type attribute****Description**

The type of data source, which can be vCenter or ESX server.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)
- ESX (0)
- vCenter (1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TYPE

**Inventory Age attribute****Description**

The number of seconds elapsed since the last time the inventory was updated.

**Type**

Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

INVENTORY\_AGE or IA

**Current CU Execution Time attribute****Description**

The number of seconds that the currently executing collection units have been executing, divided by the number of currently executing collection units.

**Type**

Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CURRENT\_CU\_EXECUTION\_TIME or CCET

### Average CU Execution Time attribute

#### **Description**

The number of seconds that the previously executed collection units executed, divided by the number of previously executed collection units.

#### **Type**

Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

AVERAGE\_CU\_EXECUTION\_TIME or ACET

### Current CU Queue Time attribute

#### **Description**

The number of seconds that the currently queued collection units have been queued, divided by the number of currently queued collection units.

#### **Type**

Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

CURRENT\_CU\_QUEUE\_TIME or CCQT

### Average CU Queue Time attribute

#### **Description**

The number of seconds that the previously queued collection units were queued, divided by the number of previously queued collection units.

#### **Type**

Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

AVERAGE\_CU\_QUEUE\_TIME or ACQT

### Collection Units attribute

#### **Description**

The total number of collection units.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

COLLECTION\_UNITS or CU

### Queued Collection Units attribute

#### Description

The total number of collection units currently queued.

#### Type

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### Warehouse name

QUEUED\_COLLECTION\_UNITS or QCU

### Executing Collection Units attribute

#### Description

The total number of collection units currently executing.

#### Type

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### Warehouse name

EXECUTING\_COLLECTION\_UNITS or ECU

## Virtual Machines attribute group

This attribute group contains basic information about the virtual machines running on a server.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the Virtual Machines attribute group:

**Node attribute: This attribute is a key attribute.**

#### Description

The managed system name of the agent.

#### Type

String

#### Source

The source for this attribute is the agent.

#### Warehouse name

NODE

### Timestamp attribute

#### Description

The local time at the agent when the data was collected.

#### Type

String

#### Source

The source for this attribute is the agent.

#### Warehouse name

TIMESTAMP

**VM Name attribute: This attribute is a key attribute.**

#### Description

The user-defined display name of this virtual machine.



**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_NAME

**VM Server Name attribute: This attribute is a key attribute.**

**Description**

The host name of the ESX server that runs this virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_SERVER\_NAME or VSN

**Power Status attribute**

**Description**

The current power status of the virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

POWER\_STATUS or PS

**Up Time attribute**

**Description**

The number of seconds since the virtual machine was started.

**Type**

DEFAULT with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

UP\_TIME

**Heartbeats attribute**

**Description**

The number of heartbeats received from the virtual machine.

**Type**

DEFAULT with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

HEARTBEATS

**GuestOS Name attribute**

**Description**

The full name of the guest operating system for this virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

GUESTOS\_NAME or GN

**Guest State attribute**

**Description**

The operational state of the guest operating system installed in this virtual machine. The values can be running, shuttingdown, resetting, standby, notrunning, and unknown.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

GUEST\_STATE or GS

**IP Address attribute**

**Description**

The IP address of this virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

IP\_ADDRESS

**Hostname attribute**

**Description**

The host name of this virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

HOSTNAME

### Num CPUs attribute

#### **Description**

The number of CPUs configured for this virtual machine.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

NUM\_CPUS

### Resource Pool attribute

#### **Description**

The name of the resource pool of which this virtual machine is a member.

#### **Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

RESOURCE\_POOL or RP

### Memory Size attribute

#### **Description**

The memory size of the virtual machine in MB.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

MEMORY\_SIZE or MS

### Memory Limit attribute

#### **Description**

The memory limit of the virtual machine in MB.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

MEMORY\_LIMIT or ML

### Tools Status attribute

#### **Description**

The operational status of the VMware VM Tools package in the guest operating system.

#### **Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise

Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TOOLS\_STATUS or TS

**VM OS Type attribute**

**Description**

The guest family for the operating system.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_OS\_TYPE

**CPU Utilization attribute**

**Description**

The overall CPU usage of this virtual machine during the collection interval.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_UTILIZATION or CU

**CPU Shares attribute**

**Description**

The number of CPU shares, the relative weight, allocated to this virtual machine. This number is the actual value when the shares level has been configured as 'custom'. In general, the more shares a virtual machine has the more resource it gets.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-2)
- Not applicable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_SHARES

**Memory Shares attribute**

**Description**

The number of memory shares, the relative weight, allocated to this virtual machine. This number is the actual value when the shares level has been configured as 'custom'. In general, the more shares a virtual machine has the more resource it gets.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-2)
- Not applicable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MEMORY\_SHARES or MS0

**Fault Tolerance attribute****Description**

An indication of the protection of the virtual machine against hardware failures. This attribute can be configured with a secondary virtual machine or it can be running on a server that is a member of a cluster that is configured for High Availability.

**Type**

Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- None (-1)
- FT Primary (1)
- FT NonPrimary (2)
- HA (3)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

FAULT\_TOLERANCE or FT

**VM Percent Ready attribute****Description**

The CPU percent ready metric across all the virtual machine CPUs.

**Type**

Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_PERCENT\_RDY or VPR

**Universally Unique Identifier attribute****Description**

The UUID (Universally Unique Identifier) for this virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

UUID

**VM MORef attribute**

**Description**

The internal managed object reference name of the virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MOREF

**Datacenter attribute: This attribute is a key attribute.****Description**

The name of this data center.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER

**Overall Status attribute****Description**

The overall status for this alarm.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

OVERALL\_STATUS or OS

**Used CPU MHz attribute****Description**

The total amount of CPU used by this virtual machine during the last sample period measured in MHz.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

USED\_CPU\_MHZ or UCM

**Cluster attribute****Description**

The name of the cluster that this virtual machine is a member of or unavailable if not a member of any cluster.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise

Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
CLUSTER

**NodeID attribute**

**Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**  
NODEID

**CPU Reservation attribute**

**Description**

Minimum amount of CPU in mhz guaranteed to be available to the virtual machine.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
CPU\_RESERVATION or CR

**Memory Reservation attribute**

**Description**

Minimum amount of memory in MB guaranteed to be available to the virtual machine.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
MEMORY\_RESERVATION or MR

**CPU Limit attribute**

**Description**

The CPU limit of the virtual machine in mhz.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
CPU\_LIMIT

**Guest OS Managed System Name attribute**

**Description**

The managed system name of the guest OS agent within the virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

GUESTOS\_MSN or GM

**Number Of Snapshots attribute****Description**

The number of snapshots stored for this virtual machine.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_OF\_SNAPSHOTS or NOS

**VM Template attribute****Description**

Indicates whether this virtual machine is a template instead of a regular virtual machine.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)
- Yes (1)
- No (0)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TEMPLATE

**Snapshot Storage Consumed attribute****Description**

The amount of disk space (in MB) that is used by the virtual machine for the snapshots.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SNAPSHOT\_STORAGE\_CONSUMED or SSC

**Storage DRS Enable attribute****Description**

Indicates whether the Storage DRS is enabled.



<b>Type</b>	<p>Integer with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• True (1)</li> <li>• False (0)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	STORAGE_DRS_ENABLE or SDE
<b><u>Connection State attribute</u></b>	
<b>Description</b>	The connection status of the virtual machine. The valid values are connected, disconnected, inaccessible, invalid, and orphaned.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	CONNECTION_STATE or CS
<b><u>Instance UUID attribute</u></b>	
<b>Description</b>	The virtual center specific 128-bit Universal Unique ID (UUID) of a virtual machine. The UUID is represented as a hexadecimal string. This identifier is used by VirtualCenter to uniquely identify all the virtual machine instances.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	INSTANCE_UUID or IU
<b><u>FT Instance UUID attribute</u></b>	
<b>Description</b>	The instance UUID of the fault tolerance virtual machine.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	FT_INSTANCE_UUID or FIU
<b><u>Include Data In Summarization 0 attribute</u></b>	
<b>Description</b>	This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived:  $(\text{Memory\_Size} < 0) \vee (\text{Memory\_Shares} < 0) \vee (\text{Memory\_Reservation} < 0) ? 0 : 1$ .

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

**Include Data In Summarization 1 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived:  $(\text{CPU\_Shares} < 0) \vee (\text{Num\_CPUs} < 0) \vee (\text{CPU\_Reservation} < 0) ? 0 : 1$ .

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

**Include Data In Summarization 2 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived:  $(\text{CPU\_Utilization} < 0) \vee (\text{Used\_CPU\_MHz} < 0) ? 0 : 1$ .

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_2 or IDIS2

**Include Data In Summarization 3 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (VM\_Percent\_RDY < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_3 or IDIS3

**Include Data In Summarization 4 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Number\_Of\_Snapshots < 0 ) || (Snapshot\_Storage\_Consumed < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_4 or IDIS4

**Include Data In Summarization 5 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Memory\_Limit < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_5 or IDIS5

**Include Data In Summarization 6 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the

Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (CPU\_Limit < 0)? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_6 or IDIS6

## Virtual Switches attribute group

This attribute group contains information about the standard virtual switches in the virtual infrastructure.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the Virtual Switches attribute group:

**Node attribute:** This attribute is a key attribute.

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Datacenter attribute:** This attribute is a key attribute.

**Description**

The name of the data center that uses this virtual switch.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DATACENTER

**Server Hostname attribute:** This attribute is a key attribute.

**Description**

The hostname of the ESX server to which the virtual switch belongs.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise

Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SERVER\_HOSTNAME or SH

**Switch attribute: This attribute is a key attribute.**

**Description**

The name of the virtual switch.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SWITCH

**Number NICs attribute**

**Description**

The number of NICs connected to the virtual switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_OF\_NICS or NON

**Transmitted attribute**

**Description**

The total transmission rate in KBps of the host on this virtual switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TRANSMITTED or T

**Received attribute**

**Description**

The total reception rate in KBps of the host on this virtual switch.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
RECEIVED	
<b>Usage attribute</b>	
<b>Description</b>	The total rate in KBps that the host is transmitting and receiving data on this virtual switch.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
USAGE	
<b>Managed System Name attribute</b>	
<b>Description</b>	The managed system name of the subnode for the ESX server of the virtual switch.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
SUBNODE_MSN or SM	
<b>Include Data In Summarization 0 attribute</b>	
<b>Description</b>	This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Value Exceeds Maximum (2147483647)</li> <li>• Value Exceeds Minimum (-2147483648)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Source</b>	The source for this attribute is derived: (Number_Of_NICs < 0)? 0 : 1.
<b>Warehouse name</b>	
INCLUDE_DATA_IN_SUMMARIZATION_0 or IDIS0	
<b>Include Data In Summarization 1 attribute</b>	
<b>Description</b>	This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p>

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Transmitted < 0 ) || (Received < 0 ) || (Usage < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

## VM CPU attribute group

This attribute group contains information about CPU usage for virtual machines that are powered on.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the VM CPU attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**VM Name attribute: This attribute is a key attribute.**

**Description**

The user-defined display name of this virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_NAME

**VM Server Name attribute: This attribute is a key attribute.**

**Description**

The host name of the ESX server that runs this virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_SERVER\_NAME or VSN

**CPU Number attribute: This attribute is a key attribute.**

**Description**

The virtual CPU number.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CPU\_NUMBER

**Wait Time attribute**

**Description**

The amount of time the CPU spent in the wait state in milliseconds.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

WAIT\_TIME

**Used Time attribute**

**Description**

The amount of time the CPU used in milliseconds.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

USED\_TIME

**Ready Time attribute**

**Description**

The amount of time the CPU spent in the ready state in milliseconds.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

READY\_TIME

**Sys Time attribute**



**Description**

The amount of time the CPU spent in the system state in milliseconds.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SYS\_TIME

**Utilization attribute****Description**

The CPU usage percentage. This value is calculated as user time divided by the sum of used, ready, and wait times.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

UTILIZATION or U

**Percent Ready attribute****Description**

The CPU ready time percentage. This value is calculated as the amount of time the VM spent in the ready state divided by the size of the sample interval.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PERCENT\_RDY or PR

**VM Name CPU Number attribute****Description**

A concatenation of the VM Name and the CPU ID.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_NAME\_CPU\_NUMBER or VNCN

**User Time attribute****Description**

The amount of time the CPU spent in the user (non\_system) state in milliseconds.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the

Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

USER\_TIME

**VM HostName attribute**

**Description**

The host name of the virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_HOSTNAME or VH

**VM OS Type attribute**

**Description**

The family for the guest operating system.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_OS\_TYPE

**NodeID attribute**

**Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

**Include Data In Summarization 0 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Wait\_Time < 0 ) || (Ready\_Time < 0 ) || (Used\_Time < 0 ) || (Utilization < 0 ) || (Percent\_Rdy < 0 ) || (User\_Time < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

## VM Datastore Utilization attribute group

This attribute group contains information about the how each virtual machine is utilizing a data store.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the VM Datastore Utilization attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute****Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Name attribute: This attribute is a key attribute.**

**Description**

The name of this datastore.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NAME

**DataCenter attribute: This attribute is a key attribute.**

**Description**

The name of the data center that contains this datastore.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
DATACENTER	
<b><u>Virtual Machine attribute</u></b>	
<b>Description</b>	The name of the virtual machine on the datastore.
<b>Type</b>	<p>String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
VIRTUAL_MACHINE or VM	
<b><u>Committed attribute</u></b>	
<b>Description</b>	The amount of space in GB, on this datastore, that is being used by this virtual machine.
<b>Type</b>	<p>Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
COMMITTED	
<b><u>Uncommitted attribute</u></b>	
<b>Description</b>	The reserved but unused amount of space in GB, on this datastore, that can be used in the future by this virtual machine.
<b>Type</b>	<p>Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
UNCOMMITTED or U	
<b><u>Provisioned attribute</u></b>	
<b>Description</b>	The total reserved amount of space in GB, on this datastore, that can be used by this virtual machine.
<b>Type</b>	<p>Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>

<b>Warehouse name</b> PROVISIONED or P	
<b>Unshared attribute</b>	
<b>Description</b>	The amount of space in GB, on this datastore, occupied by this virtual machine that is not shared with any other virtual machines.
<b>Type</b>	<p>Real number (32-bit gauge) with three decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b> UNSHARED	
<b>Percent Committed attribute</b>	
<b>Description</b>	The percentage of space on this datastore that is committed as a percentage of the provisioned amount.
<b>Type</b>	<p>Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b> PERCENT_COMMITTED or PC	
<b>Total Read attribute</b>	
<b>Description</b>	The total kilobytes read per second by this vm from this datastore.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b> TOTAL_READ_KBPS or TRK	
<b>Total Write attribute</b>	
<b>Description</b>	The total kilobytes written per second by this vm from this datastore.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b> TOTAL_WRITE_KBPS or TWK	

### **Total IO attribute**

#### **Description**

The sum of total kilobytes read and written per second by this vm from this datastore.

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Warehouse name**

TOTAL\_IO\_KBPS or TIK

### **NodeID attribute**

#### **Description**

This attribute is only for IBM-internal use.

#### **Type**

String

#### **Warehouse name**

NODEID

### **Include Data In Summarization 0 attribute**

#### **Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Source**

The source for this attribute is derived: (Committed < 0 ) || (Uncommitted < 0 ) || (Provisioned < 0 ) || (Unshared < 0 ) || (Percent\_Committed < 0 )? 0 : 1.

#### **Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

### **Include Data In Summarization 1 attribute**

#### **Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

#### **Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### **Source**

The source for this attribute is derived: (Total\_Read\_KBps < 0 ) || (Total\_Write\_KBps < 0 ) || (Total\_IO\_KBps < 0 )? 0 : 1.

**Warehouse name**  
INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

## VM Disk attribute group

This attribute group contains information about disk usage for virtual machines.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the VM Disk attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**  
The managed system name of the agent.

**Type**  
String

**Source**  
The source for this attribute is the agent.

**Warehouse name**  
NODE

**Timestamp attribute**

**Description**  
The local time at the agent when the data was collected.

**Type**  
String

**Source**  
The source for this attribute is the agent.

**Warehouse name**  
TIMESTAMP

**VM Name attribute: This attribute is a key attribute.**

**Description**  
The user-defined display name of this virtual machine.

**Type**  
String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
VM\_NAME

**VM Server Name attribute: This attribute is a key attribute.**

**Description**  
The host name of the ESX server that runs this virtual machine.

**Type**  
String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
VM\_SERVER\_NAME or VSN

**Description attribute: This attribute is a key attribute.**

**Description**  
The disk label and description.

**Type**  
String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
DESCRIPTION or D

#### Access attribute

**Description**  
The disk access (read or write).

**Type**  
String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
ACCESS

#### Capacity attribute

**Description**  
The capacity of the disk in MB.

**Type**  
Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)
- Not applicable (0)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
CAPACITY

#### Removable attribute

**Description**  
Indicates whether the disk is a removable disk.

**Type**  
String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**  
REMOVABLE

#### Connected attribute

**Description**  
Indicates whether the disk is currently connected to the virtual machine.

**Type**  
String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)



Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CONNECTED

**VM HostName attribute**

**Description**

The host name of the virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_HOSTNAME or VH

**VM OS Type attribute**

**Description**

The guest family for the operating system.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_OS\_TYPE

**Disk Shares attribute**

**Description**

The number of disk shares, or the relative weight, allocated to this virtual machine. This is the actual value when the shares level has been configured as 'custom'. In general, the more shares a virtual machine has the more resource it gets.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-2)
- Not Applicable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DISK\_SHARES or DS

**Backing data store attribute**

**Description**

The name of the data store that backs this disk.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Not Applicable (Not Applicable)
- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

BACKING\_DATASTORE or BD

**NodeID attribute**

**Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

## VM Disk Performance attribute group

This attribute group provides information about the performance of the disks that are associated with the virtual machines.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the VM Disk Performance attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Virtual Machine Name attribute: This attribute is a key attribute.**

**Description**

The name of the virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VIRTUAL\_MACHINE or VM

**Disk Name attribute: This attribute is a key attribute.**

**Description**

The name of the disk.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise

Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DISK\_NAME

**Read attribute**

**Description**

The amount of data that is read (in KB per second) from the disk during the collection interval.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

READ

**Write attribute**

**Description**

The amount of data that is written (in KB per second) to the disk during the collection interval.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

WRITE

**Number Read attribute**

**Description**

The number of times the data was read from the disk.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_READ or NR

**Number Write attribute**

**Description**

The number of times the data was written to the disk.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

NUMBER\_WRITE or NW

**VM MRef attribute**

**Description**

The internal managed object reference name of the virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

MOREF

**Include Data In Summarization 0 attribute**

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Read < 0 ) || (Write < 0 ) || (Number\_Read < 0 ) || (Number\_Write < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

## VM Memory attribute group

This attribute group contains information about memory usage for virtual machines.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the VM Memory attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute**

**Description**

The local time at the agent when the data was collected.

<b>Type</b>	String
<b>Source</b>	The source for this attribute is the agent.
<b>Warehouse name</b>	TIMESTAMP
<b><u>VM Name attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The user-defined display name of this virtual machine.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	VM_NAME
<b><u>VM Server Name attribute: This attribute is a key attribute.</u></b>	
<b>Description</b>	The host name of the ESX server that runs this virtual machine.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	VM_SERVER_NAME or VSN
<b><u>Total Size attribute</u></b>	
<b>Description</b>	Total amount of memory allocated to the virtual machine in MB.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	TOTAL_SIZE
<b><u>Max Alloc attribute</u></b>	
<b>Description</b>	Maximum amount of memory in MB that can be used by the virtual machine. The value is -1 if there is no limit.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>• Unavailable (-2)</li> <li>• No limit (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
MAX_ALLOC	
<b><u>Min Alloc attribute</u></b>	
<b>Description</b>	Minimum amount of memory in MB guaranteed to be allocated to the virtual machine.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
MIN_ALLOC	
<b><u>Host Usage attribute</u></b>	
<b>Description</b>	The amount of host (server) memory in MB that is currently being used by the virtual machine.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
HOST_USAGE	
<b><u>Swap To File attribute</u></b>	
<b>Description</b>	The total amount of virtual machine memory that has been swapped out to the swap file in KB.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
SWAP_TO_FILE or STF	
<b><u>Balloon Usage attribute</u></b>	
<b>Description</b>	The amount of memory in KB being used by the VMware balloon driver.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
BALLOON_USAGE or BU	
<b><u>Guest Usage attribute</u></b>	

**Description**

The amount of memory being used by the guest operating system in MB. The value can be between 0 and the configured memory size of the virtual machine.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

GUEST\_USAGE or GU

**Host Util attribute****Description**

The percentage of memory (average) that was used by the virtual machine over the past sample interval. This value is calculated as the percentage of MemoryHostUsage over MemoryTotalSize.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

HOST\_UTIL

**Guest Util attribute****Description**

The percentage of memory (average) that was used by the guest running in this virtual machine over the past sample interval. This value is calculated as the percentage of MemoryGuestUsage over MemoryTotalSize.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

GUEST\_UTIL

**VM HostName attribute****Description**

The host name of the virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_HOSTNAME or VH

**VM OS Type attribute**

**Description**

The guest family for the operating system.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_OS\_TYPE

**Host Free attribute****Description**

The amount of virtual machine memory currently free in MB. This value is calculated as the difference between MemoryTotalSize and MemoryHostUsage.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

HOST\_FREE

**Guest Free attribute****Description**

The amount of guest OS memory currently free in MB. This value is calculated as the difference between MemoryTotalSize and MemoryGuestUsage.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

GUEST\_FREE

**NodeID attribute****Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

**Datacenter attribute: This attribute is a key attribute.****Description**

The name of the data center that contains this virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.



<b>Warehouse name</b>	
DATACENTER	
<b>Usage attribute</b>	
<b>Description</b>	The amount of memory (in percentage) that is used from the total configured or available memory.
<b>Type</b>	<p>Real number (32-bit gauge) with two decimal places of precision with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
USAGE	
<b>Active attribute</b>	
<b>Description</b>	The amount of memory (in MB) that is actively used.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
ACTIVE	
<b>Shared attribute</b>	
<b>Description</b>	The amount of memory (in MB) that is shared with other virtual machines.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
SHARED	
<b>Granted attribute</b>	
<b>Description</b>	The amount of memory (in MB) that is mapped to the virtual machine.
<b>Type</b>	<p>Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:</p> <ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul> <p>Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.</p>
<b>Warehouse name</b>	
GRANTED	
<b>Include Data In Summarization 0 attribute</b>	

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Total\_Size < 0 ) || (Host\_Usage < 0 ) || (Host\_Util < 0 ) || (Guest\_Usage < 0 ) || (Guest\_Util < 0 ) || (Guest\_Free < 0 ) || (Host\_Free < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

**Include Data In Summarization 1 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Min\_Alloc < 0 ) || (Usage < 0 ) || (Swap\_To\_File < 0 ) || (Balloon\_Usage < 0 ) || (Active < 0 ) || (Shared < 0 ) || (Granted < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_1 or IDIS1

**Include Data In Summarization 2 attribute****Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Max\_Alloc < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_2 or IDIS2

## VM Network attribute group

This attribute group contains information about the network usage for the virtual machines on this ESX server.

### Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the VM Network attribute group:

**Node attribute: This attribute is a key attribute.**

#### Description

The managed system name of the agent.

#### Type

String

#### Source

The source for this attribute is the agent.

#### Warehouse name

NODE

### **Timestamp attribute**

#### Description

The local time at the agent when the data was collected.

#### Type

String

#### Source

The source for this attribute is the agent.

#### Warehouse name

TIMESTAMP

**VM Name attribute: This attribute is a key attribute.**

#### Description

The user-defined display name of this virtual machine.

#### Type

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### Warehouse name

VM\_NAME

**VM Server Name attribute: This attribute is a key attribute.**

#### Description

The host name of the ESX server that runs this virtual machine.

#### Type

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

#### Warehouse name

VM\_SERVER\_NAME or VSN

### **Description attribute**

#### Description

The description of this NIC.

#### Type

String with enumerated values. The strings are displayed in the Tivoli Enterprise

Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DESCRIPTION or D

**Physical Address attribute:** This attribute is a key attribute.

**Description**

The physical address of this NIC.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PHYSICAL\_ADDR or PA

**Transmitted attribute**

**Description**

The amount of data transmitted in the sample interval in KB per second.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

TRANSMITTED or T

**Received attribute**

**Description**

The amount of data received in the sample interval in KB per second.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

RECEIVED

**Pkts Transmitted attribute**

**Description**

The number of packets transmitted in the sample interval.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
PKTS_TRANS	
<b><u>Pkts Received attribute</u></b>	
<b>Description</b>	
The number of packets received in the sample interval.	
<b>Type</b>	
Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:	
<ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul>	
Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.	
<b>Warehouse name</b>	
PKTS_RECD	
<b><u>VM HostName attribute</u></b>	
<b>Description</b>	
The host name of the virtual machine.	
<b>Type</b>	
String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:	
<ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul>	
Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.	
<b>Warehouse name</b>	
VM_HOSTNAME or VH	
<b><u>VM OS Type attribute</u></b>	
<b>Description</b>	
The guest family for the operating system.	
<b>Type</b>	
Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:	
<ul style="list-style-type: none"> <li>• Unavailable (-1)</li> </ul>	
Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.	
<b>Warehouse name</b>	
VM_OS_TYPE	
<b><u>Network attribute</u></b>	
<b>Description</b>	
The network name that the virtual NIC is associated with.	
<b>Type</b>	
String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:	
<ul style="list-style-type: none"> <li>• Unavailable (Unavailable)</li> </ul>	
Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.	
<b>Warehouse name</b>	
NETWORK_NAME or NN	
<b><u>Switch attribute</u></b>	
<b>Description</b>	
The name of the virtual switch that interface uses.	

<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	SWITCH
<b><u>NodeID attribute</u></b>	
<b>Description</b>	This attribute is only for IBM-internal use.
<b>Type</b>	String
<b>Warehouse name</b>	NODEID
<b><u>Datacenter attribute</u></b>	
<b>Description</b>	The name of the data center this virtual machine is a member of.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	DATACENTER
<b><u>Cluster attribute</u></b>	
<b>Description</b>	The name of the cluster that this virtual machine is a member of or unavailable if not a member of any cluster.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	CLUSTER
<b><u>Include Data In Summarization 0 attribute</u></b>	
<b>Description</b>	This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Value Exceeds Maximum (2147483647)</li> <li>Value Exceeds Minimum (-2147483648)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Transmitted < 0 ) || (Received < 0 ) || (Pkts\_Trans < 0 ) || (Pkts\_Recd < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

## VM Orphaned Disk attribute group

This attribute group provides information about an orphaned virtual machine disk.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the VM Orphaned Disk attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute****Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**Source attribute: This attribute is a key attribute.**

**Description**

The host name of the data source.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

SOURCE

**DataCenter attribute: This attribute is a key attribute.**

**Description**

The name of the data center that the data store belongs to.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

<b>Warehouse name</b>	
DATACENTER	
<b>Datastore Cluster attribute: This attribute is a key attribute.</b>	
<b>Description</b>	The name of the data store cluster that the data store belongs to.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
DATASTORE_CLUSTER or DC	
<b>Datastore attribute: This attribute is a key attribute.</b>	
<b>Description</b>	The name of the data store that the orphaned virtual machine disk belongs to.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
DATASTORE	
<b>File Path attribute</b>	
<b>Description</b>	The path of the orphaned virtual machine disk.
<b>Type</b>	String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (Unavailable)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
FILE_PATH	
<b>File Size attribute</b>	
<b>Description</b>	The size (in MB) of the orphaned virtual machine disk.
<b>Type</b>	Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined: <ul style="list-style-type: none"> <li>Unavailable (-1)</li> </ul> Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.
<b>Warehouse name</b>	
FILE_SIZE	
<b>Last Modified attribute</b>	
<b>Description</b>	The time when the orphaned virtual machine disk was last modified.



**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

LAST\_MODIFIED or LM

**Owner attribute****Description**

The name of the owner of the orphaned virtual machine disk.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

OWNER

## VM Partition attribute group

This attribute group contains information about disk partitions for virtual machines.

**Historical group**

This attribute group is eligible for use with Tivoli Data Warehouse.

**Attribute descriptions**

The following list contains information about each attribute in the VM Partition attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

NODE

**Timestamp attribute****Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

**Warehouse name**

TIMESTAMP

**VM Name attribute: This attribute is a key attribute.**

**Description**

The user-defined display name of this virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_NAME

**VM Server Name attribute: This attribute is a key attribute.**

**Description**

The host name of the ESX server that runs this virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_SERVER\_NAME or VSN

**Description attribute: This attribute is a key attribute.**

**Description**

The description or label of this disk partition.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

DESCRIPTION or D

**Capacity attribute**

**Description**

The size of the partition in MB.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

CAPACITY

**Free Space attribute**

**Description**

The amount of unused space in MB.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

FREE\_SPACE

**Used Space attribute**

**Description**

The amount of space used in MB.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

USED\_SPACE

**Percent Used attribute****Description**

The percentage usage of used space.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PERCENT\_USED or PU

**Percent Free attribute****Description**

The percentage of space on the partition is unallocated.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

PERCENT\_FREE or PF

**VM HostName attribute****Description**

The host name of the virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_HOSTNAME or VH

**VM OS Type attribute****Description**

The guest family for the operating system.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Warehouse name**

VM\_OS\_TYPE

#### NodeID attribute

**Description**

This attribute is only for IBM-internal use.

**Type**

String

**Warehouse name**

NODEID

#### Include Data In Summarization 0 attribute

**Description**

This attribute is only for IBM-internal use. Indicates whether to include certain attribute data (numbers) in Tivoli Data Warehouse summarization. The valid values are 0 (exclude) and 1 (include).

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Value Exceeds Maximum (2147483647)
- Value Exceeds Minimum (-2147483648)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: (Free\_Space < 0 ) || (Used\_Space < 0 ) || (Percent\_Used < 0 ) || (Percent\_Free < 0 )? 0 : 1.

**Warehouse name**

INCLUDE\_DATA\_IN\_SUMMARIZATION\_0 or IDIS0

## VM Snapshot attribute group

This attribute group is for IBM-internal use only.

### Historical group

This attribute group is not eligible for use with Tivoli Data Warehouse.

### Attribute descriptions

The following list contains information about each attribute in the VM Snapshot attribute group:

**Node attribute: This attribute is a key attribute.**

**Description**

The managed system name of the agent.

**Type**

String

**Source**

The source for this attribute is the agent.

#### Timestamp attribute

**Description**

The local time at the agent when the data was collected.

**Type**

String

**Source**

The source for this attribute is the agent.

## VM SnapshotFileLayout attribute group

This attribute group is for IBM-internal use only.

## Historical group

This attribute group is not eligible for use with Tivoli Data Warehouse.

## Attribute descriptions

The following list contains information about each attribute in the VM SnapshotFileLayout attribute group:

**Node attribute: This attribute is a key attribute.**

### Description

The managed system name of the agent.

### Type

String

### Source

The source for this attribute is the agent.

## **Timestamp attribute**

### Description

The local time at the agent when the data was collected.

### Type

String

### Source

The source for this attribute is the agent.

## VM Snapshots attribute group

This attribute group provides information about the snapshots for the virtual machines.

## Historical group

This attribute group is eligible for use with Tivoli Data Warehouse.

## Attribute descriptions

The following list contains information about each attribute in the VM Snapshots attribute group:

**Node attribute: This attribute is a key attribute.**

### Description

The managed system name of the agent.

### Type

String

### Source

The source for this attribute is the agent.

### Warehouse name

NODE

## **Timestamp attribute**

### Description

The local time at the agent when the data was collected.

### Type

String

### Source

The source for this attribute is the agent.

### Warehouse name

TIMESTAMP

## **Snapshot Name attribute**

### Description

The name of the snapshot.

### Type

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: Snapshot\_Name\_I.

**Warehouse name**

SNAPSHOT\_NAME or SN

**VM Name attribute****Description**

The name of the virtual machine.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: VM\_Name\_I.

**Warehouse name**

VM\_NAME

**Creation Time attribute****Description**

The date and time when the snapshot was created.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: Creation\_Date\_I.

**Warehouse name**

CREATION\_TIME or CT

**Description attribute****Description**

The description of the snapshot.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: Description\_I.

**Warehouse name**

DESCRIPTION or D

**VM State attribute****Description**

The state of the virtual machine when the snapshot was created.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: Virtual\_Machine\_State\_I.

**Warehouse name**

VM\_STATE

**Space Consumed attribute**

**Description**

The amount of disk space (in MB) that is used by the snapshot.

**Type**

Integer (32-bit gauge) with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (-1)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: Space\_Consumed\_I.

**Warehouse name**

SPACE\_CONSUMED or SC

**Snapshot MOREf attribute: This attribute is a key attribute.**

**Description**

The internal managed object reference name of the snapshot.

**Type**

String with enumerated values. The strings are displayed in the Tivoli Enterprise Portal. The warehouse and queries return the values that are shown in parentheses. The following values are defined:

- Unavailable (Unavailable)

Any other value is the value that is returned by the agent in the Tivoli Enterprise Portal.

**Source**

The source for this attribute is derived: ManRef\_I.

**Warehouse name**

SNAPSHOT\_MOREF or SM

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## Disk capacity planning for historical data

Disk capacity planning for a monitoring agent is a prediction of the amount of disk space to be consumed for each attribute group with historical data that is being collected. Required disk storage is an important factor when you are defining data collection rules and your strategy for historical data collection.

The Capacity planning for historical data table provides the following information required to calculate disk space for this monitoring agent:

**Table** Table name as it is displayed in the warehouse database, if the attribute group is configured to be written to the warehouse. The table name listed here corresponds to the table name in “Attribute groups for the monitoring agent” on page 33.

**Attribute group**

Name of the attribute group used to create the table in the warehouse database if it is short enough to fit in the table naming constraints of the database being used for the warehouse. The attribute group name listed here corresponds to the Warehouse table name in “Attribute groups for the monitoring agent” on page 33.

**Bytes per row (agent)**

Estimate of the record length for each row or instance written to the agent disk for historical data collection. This estimate can be used for agent disk space planning purposes.

**Database bytes per row (warehouse)**

Estimate of the record length for detailed records written to the warehouse database, if the attribute group is configured to be written to the warehouse. Detailed records are records that have been uploaded from the agent for long-term historical data collection. This estimate can be used for warehouse disk-space planning purposes.

**Aggregate bytes per row (warehouse)**

Estimate of the record length for aggregate records written to the warehouse database, if the attribute group is configured to be written to the warehouse. Aggregate records are created by the Summarization agent for attribute groups that have been configured for summarization. This estimate can be used for warehouse disk-space planning purposes.

In addition to the information in the tables, you must know the number of rows of data that you plan to collect. An attribute group can have single or multiple rows of data depending on the application environment that is being monitored. For example, if your attribute group is monitoring each processor in your computer and you have a dual processor computer, the number of rows is two.

*Table 1. Capacity planning for historical data logged by the VMware VI agent*

Table	Attribute group	Bytes per row (agent)	Database bytes per row (warehouse)	Aggregate bytes per row (warehouse)
KVMATASKS	KVM_ACTIVE_TASKS	880	885	922
KVMAEVENTS	KVM_AGENT_EVENTS	220	221	258
KVMCLTRDST	KVM_CLUSTERED_DATASTORES	882	893	1098
KVMCLTRRPS	KVM_CLUSTERED_RESOURCE_POOLS	658	668	963
KVMCLTRSRV	KVM_CLUSTERED_SERVERS	628	643	1106
KVMCLTVAPS	KVM_CLUSTERED_VIRTUAL_APPS	846	855	1009
KVMCLTRVMS	KVM_CLUSTERED_VIRTUAL_MACHINES	588	593	720
KVMCLUSTRT	KVM_CLUSTERS	896	1050	2953
KVMCLTRSF	KVM_CLUSTER_DRS_FAULTS	1576	1587	1624
KVMDCTRS	KVM_DATACENTERS	378	426	898
KVMDSTORES	KVM_DATASTORES	1300	1367	2136
KVMDRCLUST	KVM_DATASTORE_CLUSTER	512	545	825
KVMDSHSD	KVM_DATASTORE_HOST_DISKS	576	577	614
KVMSTOPO	KVM_DATASTORE_TOPOLOGY	826	830	867
KVMDIRE	KVM_DIRECTOR	146	145	182
KVMDVPGRPS	KVM_DISTRIBUTED_VIRTUAL_PORTGROUPS	622	636	970
KVMDVSWTCH	KVM_DISTRIBUTED_VIRTUAL_SWITCHES	378	390	826
KVMDVSHLTH	KVM_DISTRIBUTED_VIRTUAL_SWITCH_HEALTH	1076	1084	1121
KVMDVUPLNK	KVM_DISTRIBUTED_VIRTUAL_UPLINKS	858	885	1165
KVMESXPOS	KVM_ESX_PERFORMANCE_OBJECT_STATUS	352	399	664
KVMIRAEVNT	KVM_EVENTS	1968	1985	2034
KVMDAG	KVM_MONITORED_SERVERS	197	198	235



Table 1. Capacity planning for historical data logged by the VMware VI agent (continued)

Table	Attribute group	Bytes per row (agent)	Database bytes per row (warehouse)	Aggregate bytes per row (warehouse)
KVMNETSERV	KVM_NETWORKED_SERVERS	542	547	713
KVMNETVM	KVM_NETWORKED_VIRTUAL_MACHINES	742	749	915
KVMNVSWITC	KVM_NETWORKED_VIRTUAL_SWITCHES	550	557	774
KVMDCNETS	KVM_NETWORKS	534	537	652
KVMPOBJST	KVM_PERFORMANCE_OBJECT_STATUS	352	399	664
KVMRSPOLC	KVM_RESOURCE_POOL_CPU	640	657	1171
KVMRSPOLG	KVM_RESOURCE_POOL_GENERAL	608	617	885
KVMRSPOLM	KVM_RESOURCE_POOL_MEMORY	640	657	1171
KVMSEVERG	KVM_SERVER	2310	2425	3632
KVMSEVERC	KVM_SERVER_CPU	296	311	462
KVMSEVRDS	KVM_SERVER_DATASTORE	716	729	1102
KVMSEVERD	KVM_SERVER_DISK	592	621	1600
KVMSRVHBAS	KVM_SERVER_HBA	670	685	1097
KVMSVRHLTH	KVM_SERVER_HEALTH	780	795	883
KVMSEVERM	KVM_SERVER_MEMORY	368	389	1188
KVMSEVERN	KVM_SERVER_NETWORK	828	858	1333
KVMSRVRSAN	KVM_SERVER_SAN	488	491	645
KVMSRVVSWI	KVM_SERVER_VIRTUAL_SWITCHES	496	501	706
KVMSVMDSUT	KVM_SERVER_VM_DATASTORE_UTILIZATION	500	566	870
KVMSEVERE	KVM_SUBNODE_EVENTS	1904	1920	1969
KVMTASKS	KVM_TASKS	1976	1986	2023
KVMTHPLST	KVM_THREAD_POOL_STATUS	124	168	550
KVMTPEVNT	KVM_TOPOLOGICAL_EVENTS	498	502	539
KVMTPOPO	KVM_TOPOLOGY	826	830	867
KVMALARMS	KVM_TRIGGERED_ALARMS	814	821	858
KVMVCENTER	KVM_VCENERS	444	514	1001
KVMVM_GEN	KVM_VIRTUAL_MACHINES	1716	1769	2517
KVMVSWITCH	KVM_VIRTUAL_SWITCHES	450	456	673
KVMVM_CPU	KVM_VM_CPU	616	627	988
KVMVMDSUTL	KVM_VM_DATASTORE_UTILIZATION	516	586	1019
KVMVM_DISK	KVM_VM_DISK	988	996	1150
KVMVMDKPRF	KVM_VM_DISK_PERFORMANCE	346	350	555
KVMVM_MEM	KVM_VM_MEMORY	652	684	1393
KVMVM_NET	KVM_VM_NETWORK	1100	1112	1356
KVMVMORPDI	KVM_VM_ORPHANED_DISK	780	784	860
KVMVM_PART	KVM_VM_PARTITION	604	612	895
KVMVMSNAP	KVM_VM_SNAPSHOT	76	72	109

Table 1. Capacity planning for historical data logged by the VMware VI agent (continued)

Table	Attribute group	Bytes per row (agent)	Database bytes per row (warehouse)	Aggregate bytes per row (warehouse)
KVMVMSNPFL	KVM_VM_SNAPSHOTFILELAYOUT	76	72	109
KVMVMSNAPS	KVM_VM_SNAPSHOTS	680	683	759

For more information about historical data collection, see “Managing historical data” in the *IBM Tivoli Monitoring Administrator's Guide*.

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## Chapter 5. Situations reference

A situation is a logical expression involving one or more system conditions. Situations are used to monitor the condition of systems in your network. You can manage situations from the Tivoli Enterprise Portal by using the Situation Editor or from the command-line interface using the `tacmd` commands for situations. You can manage private situations in the private configuration XML file.

### About situations

The monitoring agents that you use to monitor your system environment include a set of predefined situations that you can use as-is. You can also create new situations to meet your requirements.

Predefined situations contain attributes that check for system conditions common to many enterprises. Using predefined situations can improve the speed with which you can begin using the IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI. You can change the conditions or values being monitored by a predefined situation to the conditions or values best suited to your enterprise.

You can display predefined situations and create your own situations using the Situation editor. The Situation editor initially lists the situations associated with the Navigator item that you selected. When you click a situation name or create a situation, a panel opens with the following tabs:

#### Formula

Formula describing the condition being tested.

#### Distribution

List of managed systems (operating systems, subsystems, or applications) to which the situation can be distributed. All the VMware VI agent managed systems are assigned by default.

#### Expert advice

Comments and instructions to be read in the event workspace.

#### Action

Command to be sent to the system.

**EIF** Customize forwarding of the event to an Event Integration Facility receiver. (Available when the Tivoli Enterprise Monitoring Server is configured to forward events.)

**Until** Options to close the event after a period of time, or when another situation becomes true.

### Additional information about situations

The *Tivoli Enterprise Portal User's Guide* contains more information about predefined and custom situations and how to use them to respond to alerts.

For a list of the predefined situations and information about each individual situation for this monitoring agent, see "Predefined situations."

---

## Predefined situations

The monitoring agent contains predefined situations, which are organized by Navigator item.

Agent level Navigator items

- VMware VI
  - Not applicable
- Clusters

- KVM\_Cluster\_Effective\_CPU\_Low
- KVM\_Cluster\_CPU\_Util\_High
- KVM\_Cluster\_Effective\_Mem\_Low
- KVM\_Cluster\_Memory\_Util\_High
- KVM\_Cluster\_Effective\_Svrs\_Low
- KVM\_Cluster\_Bad\_Status
- Datastores
  - KVM\_Datastore\_Usage\_High
  - KVM\_Datastore\_Inaccessible
  - KVM\_Datastore\_Bad\_Status
- Events
  - KVM\_Cluster\_Critical\_Event
  - KVM\_Datastore\_Critical\_Event
  - KVM\_VM\_Critical\_Event
- Monitored Servers
  - KVM\_Take\_Action\_Failure
  - KVM\_Collection\_Error
  - KVM\_ESX\_Server\_Unavailable
  - KVM\_Host\_System\_Created
  - KVM\_Host\_System\_Destroyed
  - KVM\_Virtual\_Machine\_Created
  - KVM\_Virtual\_Machine\_Destroyed
  - KVM\_Virtual\_Machine\_Relocated
  - KVM\_Host\_System\_Created2
  - KVM\_Host\_System\_Destroyed2
  - KVM\_Virtual\_Machine\_Created2
  - KVM\_Virtual\_Machine\_Destroyed2
  - KVM\_Virtual\_Machine\_Relocated2
  - KVM\_Connection\_Failure
  - KVM\_Inventory\_Out\_Of\_Date
  - KVM\_Collection\_Time\_Excessive
- Networks
  - Not applicable

#### VMware VI (ESX) subnode

- VMware VI
  - Not applicable
- CPU
  - KVM\_VM\_CPU\_Util\_High
  - KVM\_VM\_CPU\_Ready\_High
- Disk
  - KVM\_Server\_Disk\_Reads\_High
  - KVM\_Server\_Disk\_Writes\_High
  - KVM\_VM\_Disk\_Free\_Low
- ESX Server

- KVM\_Server\_CPU\_Util\_High
- KVM\_Server\_Memory\_Util\_High
- KVM\_ESX\_Server\_Disconnected
- KVM\_Host\_Server\_Bad\_Status
- KVM\_Server\_VMotion\_Event
- KVM\_Server\_Critical\_Event
- KVM\_Server\_VM\_Critical\_Event
- KVM\_Server\_Datastore\_Free\_Low
- KVM\_Server\_HBA\_Fault
- Memory
  - KVM\_VM\_Guest\_Memory\_Util\_High
  - KVM\_VM\_Host\_Memory\_Util\_High
- Network
  - KVM\_Server\_Transmit\_Rate\_High
  - KVM\_Server\_Receive\_Rate\_High
  - KVM\_Server\_NIC\_Down
  - KVM\_VM\_Transmit\_Rate\_High
  - KVM\_VM\_Receive\_Rate\_High
- Resource Pools
  - KVM\_Resource\_Pool\_CPU\_High
  - KVM\_Resource\_Pool\_Memory\_High
- Virtual Machines
  - KVM\_VM\_Powered\_Off
  - KVM\_Snapshots\_High
  - KVM\_VM\_Bad\_Status

---

## Situation descriptions

Each situation description provides information about the situation that you can use to monitor the condition of systems in your network.

The situation descriptions provide the following information:

### Description

Information about the conditions that the situation tests.

### Formula

Syntax that contains one or more logical expressions that describe the conditions for the situation to monitor.

### Distribution

Whether the situation is automatically distributed to instances of the agent or is available for manual distribution.

### Run at startup

Whether the situation starts monitoring when the agent starts.

### Sampling interval

Number of seconds that elapse between one sample of data that the monitoring agent collects for the server and the next sample.

**Situation persistence**

Whether the conditions specified in the situation evaluate to "true" for the defined number of occurrences in a row before the situation is raised. The default of one means that no persistence-checking takes place.

**Severity**

Severity of the predefined events: Warning, Informational, or Critical.

**Clearing conditions**

Controls when a true situation closes: after a period, when another situation is true, or whichever occurs first if both are selected.

**VMware VI Navigator item**

No predefined situations are included for this Navigator item.

**Clusters Navigator item**

The situation descriptions are organized by the Navigator item to which the situations are relevant.

**KVM\_Cluster\_Effective\_CPU\_Low situation****Description**

The effective CPU amount of the cluster is low.

The situation is evaluated for each distinct value of the DATACENTER attribute.

**Formula**

```
*IF *VALUE KVM_CLUSTERS.Percent_Effective_CPU *GE 0 *AND *VALUE
KVM_CLUSTERS.Percent_Effective_CPU *LT 50
```

See "Attributes in each attribute group" on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

1 minute 30 seconds

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Cluster\_CPU\_Util\_High situation****Description**

The CPU utilization of the cluster is high.

The situation is evaluated for each distinct value of the DATACENTER attribute.

**Formula**

```
*IF *VALUE KVM_CLUSTERS.CPU_Utilization *GT 90
```

See "Attributes in each attribute group" on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

1 minute 30 seconds

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Cluster\_Effective\_Mem\_Low situation****Description**

The effective memory of the cluster amount is low.

The situation is evaluated for each distinct value of the DATACENTER attribute.

**Formula**

\*IF \*VALUE KVM\_CLUSTERS.Percent\_Effective\_Memory \*GE 0 \*AND \*VALUE  
KVM\_CLUSTERS.Percent\_Effective\_Memory \*LT 50

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

1 minute 30 seconds

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Cluster\_Memory\_Util\_High situation****Description**

The memory utilization of the cluster is high.

The situation is evaluated for each distinct value of the DATACENTER attribute.

**Formula**

\*IF \*VALUE KVM\_CLUSTERS.Memory\_Utilization \*GT 90

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

1 minute 30 seconds

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Cluster\_Effective\_Svrs\_Low situation****Description**

The number of effective servers in the cluster is low.

The situation is evaluated for each distinct value of the DATACENTER attribute.

**Formula**

\*IF \*VALUE KVM\_CLUSTERS.Percent\_Effective\_Servers \*GE 0 \*AND \*VALUE  
KVM\_CLUSTERS.Percent\_Effective\_Servers \*LT 30

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

1 minute 30 seconds

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Cluster\_Bad\_Status situation**

**Description**

The status of the cluster is not green.

The situation is evaluated for each distinct value of Cluster\_Name.

**Formula**

\*IF \*VALUE KVM\_CLUSTERS.Overall\_Status \*NE 'Unavailable' \*AND \*VALUE  
KVM\_CLUSTERS.Overall\_Status \*NE 'green'

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

## Datastores Navigator item

The situation descriptions are organized by the Navigator item to which the situations are relevant.

**KVM\_Datastore\_Usage\_High situation**

**Description**

The data store is nearing or is at its defined capacity.

The situation is evaluated for each distinct value of the NAME attribute.

**Formula**

\*IF \*VALUE KVM\_DATASTORES.Percent\_Used \*GT 90

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.



**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

30 seconds

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Critical

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Datastore\_Inaccessible situation****Description**

The connectivity status of the data store is currently false.

The situation is evaluated for each distinct value of the NAME attribute.

**Formula**

```
*IF *VALUE KVM_DATASTORES.Accessible *EQ 'No'
```

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

30 seconds

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Datastore\_Bad\_Status situation****Description**

The status of the data store is not green.

The situation is evaluated for each distinct value of the NAME attribute.

**Formula**

```
*IF *VALUE KVM_DATASTORES.Overall_Status *NE 'Unavailable' *AND *VALUE
KVM_DATASTORES.Overall_Status *NE 'green'
```

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

30 seconds

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

### **Clearing conditions**

The situation clears when the condition becomes false.

## **Events Navigator item**

The situation descriptions are organized by the Navigator item to which the situations are relevant.

### **KVM\_Cluster\_Critical\_Event situation**

#### **Description**

An error has occurred on the cluster.

The situation is evaluated for each distinct value of Compute\_Resource.

#### **Formula**

\*IF \*VALUE KVM\_EVENTS.Entity\_Type \*EQ 'Cluster' \*AND \*VALUE KVM\_EVENTS.Category \*EQ 'error'

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

#### **Distribution**

This situation is automatically distributed to instances of this agent.

#### **Run at startup**

Yes

#### **Sampling interval**

None. Data is analyzed when it becomes available.

#### **Situation persistence**

Not Applicable

#### **Error conditions**

Critical

#### **Clearing conditions**

The situation does not clear automatically.

### **KVM\_Datastore\_Critical\_Event situation**

#### **Description**

An error has occurred on the data store.

The situation is evaluated for each distinct value of Datastore.

#### **Formula**

\*IF \*VALUE KVM\_EVENTS.Entity\_Type \*EQ 'Datastore' \*AND \*VALUE KVM\_EVENTS.Category \*EQ 'error'

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

#### **Distribution**

This situation is automatically distributed to instances of this agent.

#### **Run at startup**

Yes

#### **Sampling interval**

None. Data is analyzed when it becomes available.

#### **Situation persistence**

Not Applicable

#### **Error conditions**

Critical

#### **Clearing conditions**

The situation does not clear automatically.

### **KVM\_VM\_Critical\_Event situation**

#### **Description**

An error has occurred on the virtual machine.

The situation is evaluated for each distinct value of Virtual\_Machine.

**Formula**

\*IF \*VALUE KVM\_EVENTS.Entity\_Type \*EQ 'VirtualMachine' \*AND \*VALUE KVM\_EVENTS.Category \*EQ 'error'

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

None. Data is analyzed when it becomes available.

**Situation persistence**

Not Applicable

**Error conditions**

Critical

**Clearing conditions**

The situation does not clear automatically.

## Monitored Servers Navigator item

The situation descriptions are organized by the Navigator item to which the situations are relevant.

### KVM\_Take\_Action\_Failure situation

**Description**

A problem occurred during a Take Action command.

The situation is evaluated for the table.

**Formula**

\*IF \*VALUE KVM\_AGENT\_EVENTS.Subsystem \*EQ Task \*AND \*VALUE KVM\_AGENT\_EVENTS.Severity \*EQ Warning

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

None. Data is analyzed when it becomes available.

**Situation persistence**

Not Applicable

**Error conditions**

Warning

**Clearing conditions**

The situation does not clear automatically.

### KVM\_Collection\_Error situation

**Description**

An ESX server is not responding to performance API queries.

The situation is evaluated for the table.

**Formula**

\*IF \*VALUE KVM\_AGENT\_EVENTS.Message \*EQ 23 \*AND \*VALUE KVM\_AGENT\_EVENTS.Severity \*EQ Warning

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

None. Data is analyzed when it becomes available.

**Situation persistence**

Not Applicable

**Error conditions**

Warning

**Clearing conditions**

The situation does not clear automatically.

**KVM\_ESX\_Server\_Unavailable situation****Description**

An ESX Server is unavailable.

The situation is evaluated for each distinct value of the NODENAME attribute.

**Formula**

```
*IF *VALUE KVM_TOPOLOGY.NodeStatus *NE 'Unavailable' *AND *VALUE  
KVM_TOPOLOGY.NodeStatus *NE 'connected' *AND *VALUE KVM_TOPOLOGY.NodeType *EQ  
'kvm.ESX_Server'
```

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

1 minute 30 seconds

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Host\_System\_Created situation****Description**

A new ESX server was created.

The situation is evaluated for each distinct value of the ET attribute.

**Formula**

```
*IF *VALUE KVM_TOPOLOGICAL_EVENTS.Entity_Type *EQ 'Host System' *AND *VALUE  
KVM_TOPOLOGICAL_EVENTS.Event_Type *EQ 'Created'
```

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

None. Data is analyzed when it becomes available.

**Situation persistence**

Not Applicable

**Error conditions**

Informational

**Clearing conditions**

The situation does not clear automatically.

## **KVM\_Host\_System\_Destroyed situation**

### **Description**

An ESX server was destroyed.

The situation is evaluated for each distinct value of the ET attribute.

### **Formula**

\*IF \*VALUE KVM\_TOPOLOGICAL\_EVENTS.Entity\_Type \*EQ 'Host System' \*AND \*VALUE KVM\_TOPOLOGICAL\_EVENTS.Event\_Type \*EQ 'Destroyed'

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

### **Distribution**

This situation is available for distribution.

### **Run at startup**

No

### **Sampling interval**

None. Data is analyzed when it becomes available.

### **Situation persistence**

Not Applicable

### **Error conditions**

Informational

### **Clearing conditions**

The situation does not clear automatically.

## **KVM\_Virtual\_Machine\_Created situation**

### **Description**

A new virtual machine was created.

The situation is evaluated for each distinct value of the ET attribute.

### **Formula**

\*IF \*VALUE KVM\_TOPOLOGICAL\_EVENTS.Entity\_Type \*EQ 'Virtual Machine' \*AND \*VALUE KVM\_TOPOLOGICAL\_EVENTS.Event\_Type \*EQ 'Created'

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

### **Distribution**

This situation is available for distribution.

### **Run at startup**

No

### **Sampling interval**

None. Data is analyzed when it becomes available.

### **Situation persistence**

Not Applicable

### **Error conditions**

Informational

### **Clearing conditions**

The situation does not clear automatically.

## **KVM\_Virtual\_Machine\_Destroyed situation**

### **Description**

A virtual machine was destroyed.

The situation is evaluated for each distinct value of the ET attribute.

### **Formula**

\*IF \*VALUE KVM\_TOPOLOGICAL\_EVENTS.Entity\_Type \*EQ 'Virtual Machine' \*AND \*VALUE KVM\_TOPOLOGICAL\_EVENTS.Event\_Type \*EQ 'Destroyed'

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

### **Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

None. Data is analyzed when it becomes available.

**Situation persistence**

Not Applicable

**Error conditions**

Informational

**Clearing conditions**

The situation does not clear automatically.

**KVM\_Virtual\_Machine\_Relocated situation****Description**

A virtual machine was relocated.

The situation is evaluated for each distinct value of the ET attribute.

**Formula**

\*IF \*VALUE KVM\_TOPOLOGICAL\_EVENTS.Entity\_Type \*EQ 'Virtual Machine' \*AND \*VALUE KVM\_TOPOLOGICAL\_EVENTS.Event\_Type \*EQ 'Relocated'

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

None. Data is analyzed when it becomes available.

**Situation persistence**

Not Applicable

**Error conditions**

Informational

**Clearing conditions**

The situation does not clear automatically.

**KVM\_Host\_System\_Created2 situation****Description**

A new ESX server was created.

The situation is evaluated for each distinct value of Name.

**Formula**

\*IF \*VALUE KVM\_TOPOLOGICAL\_EVENTS.Entity\_Type \*EQ 'Host System' \*AND \*VALUE KVM\_TOPOLOGICAL\_EVENTS.Event\_Type \*EQ 'Created'

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

None. Data is analyzed when it becomes available.

**Situation persistence**

Not Applicable

**Error conditions**

Informational

**Clearing conditions**

The situation does not clear automatically.

**KVM\_Host\_System\_Destroyed2 situation**

**Description**

An ESX server was destroyed.

The situation is evaluated for each distinct value of Name.

**Formula**

```
*IF *VALUE KVM_TOPOLOGICAL_EVENTS.Entity_Type *EQ 'Host System' *AND *VALUE
KVM_TOPOLOGICAL_EVENTS.Event_Type *EQ 'Destroyed'
```

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

None. Data is analyzed when it becomes available.

**Situation persistence**

Not Applicable

**Error conditions**

Informational

**Clearing conditions**

The situation does not clear automatically.

**KVM\_Virtual\_Machine\_Created2 situation****Description**

A new virtual machine was created.

The situation is evaluated for each distinct value of Name.

**Formula**

```
*IF *VALUE KVM_TOPOLOGICAL_EVENTS.Entity_Type *EQ 'Virtual Machine' *AND *VALUE
KVM_TOPOLOGICAL_EVENTS.Event_Type *EQ 'Created'
```

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

None. Data is analyzed when it becomes available.

**Situation persistence**

Not Applicable

**Error conditions**

Informational

**Clearing conditions**

The situation does not clear automatically.

**KVM\_Virtual\_Machine\_Destroyed2 situation****Description**

A virtual machine was destroyed.

The situation is evaluated for each distinct value of Name.

**Formula**

```
*IF *VALUE KVM_TOPOLOGICAL_EVENTS.Entity_Type *EQ 'Virtual Machine' *AND *VALUE
KVM_TOPOLOGICAL_EVENTS.Event_Type *EQ 'Destroyed'
```

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

None. Data is analyzed when it becomes available.

**Situation persistence**

Not Applicable

**Error conditions**

Informational

**Clearing conditions**

The situation does not clear automatically.

**KVM\_Virtual\_Machine\_Relocated2 situation****Description**

A virtual machine was relocated.

The situation is evaluated for each distinct value of Name.

**Formula**

\*IF \*VALUE KVM\_TOPOLOGICAL\_EVENTS.Entity\_Type \*EQ 'Virtual Machine' \*AND \*VALUE KVM\_TOPOLOGICAL\_EVENTS.Event\_Type \*EQ 'Relocated'

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

None. Data is analyzed when it becomes available.

**Situation persistence**

Not Applicable

**Error conditions**

Informational

**Clearing conditions**

The situation does not clear automatically.

**KVM\_Connection\_Failure situation****Description**

A problem exists with the data source connection.

The situation is evaluated for each distinct value of Configured\_Address.

**Formula**

\*IF \*VALUE KVM\_VCENTERS.Agent\_Connection \*EQ 0

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

30 seconds

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Critical

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Inventory\_Out\_Of\_Date situation**



**Description**

The agent inventory is out of date.

The situation is evaluated for each distinct value of Configured\_Address.

**Formula**

\*IF \*VALUE KVM\_VCENTERS.Inventory\_Age \*GT 180000

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

30 seconds

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Critical

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Collection\_Time\_Excessive situation****Description**

A data collection is taking excessively long.

The situation is evaluated for each distinct value of Configured\_Address.

**Formula**

\*IF \*VALUE KVM\_VCENTERS.Current\_CU\_Execution\_Time \*GT 600000

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

2 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Critical

**Clearing conditions**

The situation clears when the condition becomes false.

**Networks Navigator item**

No predefined situations are included for this Navigator item.

**VMware VI subnode**

The situation descriptions are organized by the Navigator item to which the situations are relevant.

**VMware VI Navigator item**

No predefined situations are included for this Navigator item.

## CPU Navigator item

### KVM\_VM\_CPU\_Util\_High situation

#### Description

The CPU utilization is high.

The situation is evaluated for each distinct value of the VM\_NAME attribute.

#### Formula

\*IF \*VALUE KVM\_VM\_CPU.Utilization \*GT 90

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

#### Distribution

This situation is automatically distributed to instances of this agent.

#### Run at startup

Yes

#### Sampling interval

15 minutes

#### Situation persistence

The number of times the conditions of the situation must occur for the situation to be true is 1.

#### Error conditions

Critical

#### Clearing conditions

The situation clears when the condition becomes false.

### KVM\_VM\_CPU\_Ready\_High situation

#### Description

The CPU percent ready is high.

The situation is evaluated for each distinct value of the VM\_NAME attribute.

#### Formula

\*IF \*VALUE KVM\_VM\_CPU.Percent\_Rdy \*GT 15

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

#### Distribution

This situation is available for distribution.

#### Run at startup

No

#### Sampling interval

15 minutes

#### Situation persistence

The number of times the conditions of the situation must occur for the situation to be true is 1.

#### Error conditions

Warning

#### Clearing conditions

The situation clears when the condition becomes false.

## Disk Navigator item

### KVM\_Server\_Disk\_Reads\_High situation

#### Description

The disk read activity is high.

The situation is evaluated for each distinct value of the SH attribute.

#### Formula

\*IF \*VALUE KVM\_SERVER\_DISK.Read \*GT 5000

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Server\_Disk\_Writes\_High situation****Description**

The disk write activity is high.

The situation is evaluated for each distinct value of the SH attribute.

**Formula**

\*IF \*VALUE KVM\_SERVER\_DISK.Write \*GT 5000

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_VM\_Disk\_Free\_Low situation****Description**

The virtual machine disk partition free space is low.

The situation is evaluated for each distinct value of the VM\_NAME attribute.

**Formula**

\*IF \*VALUE KVM\_VM\_PARTITION.Percent\_Free \*GE 0 \*AND \*VALUE  
KVM\_VM\_PARTITION.Percent\_Free \*LT 10

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**ESX Server Navigator item****KVM\_Server\_CPU\_Util\_High situation****Description**

The CPU utilization is high.

The situation is evaluated for each distinct value of the SH attribute.

**Formula**

\*IF \*VALUE KVM\_SERVER.Overall\_CPU\_Util \*GE 90

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Server\_Memory\_Util\_High situation****Description**

The memory utilization is high.

The situation is evaluated for each distinct value of the SH attribute.

**Formula**

\*IF \*VALUE KVM\_SERVER.Overall\_Memory\_Util \*GE 90

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_ESX\_Server\_Disconnected situation****Description**

An ESX Server is not connected.

The situation is evaluated for each distinct value of the SH attribute.

**Formula**

```
*IF *VALUE KVM_SERVER.Connection_State *NE 'Unavailable' *AND *VALUE
KVM_SERVER.Connection_State *NE 'connected' *AND *VALUE
KVM_SERVER.Maintenance_Mode *NE Yes
```

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

1 minute 30 seconds

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Host\_Server\_Bad\_Status situation****Description**

The status of the host server is not green.

The situation is evaluated for each distinct value of Server\_Hostname.

**Formula**

```
*IF *VALUE KVM_SERVER.Overall_Status *NE 'Unavailable' *AND *VALUE
KVM_SERVER.Overall_Status *NE 'green'
```

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Server\_VMotion\_Event situation****Description**

A VMotion event has been detected.

The situation is evaluated for each distinct value of Event\_Text.

**Formula**

```
*IF *VALUE KVM_SUBNODE_EVENTS.Event_Type *EQ 'VmMigratedEvent' *OR *VALUE
KVM_SUBNODE_EVENTS.Event_Type *EQ 'DrsVmMigratedEvent'
```

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

None. Data is analyzed when it becomes available.

**Situation persistence**

Not Applicable

**Error conditions**

Informational

**Clearing conditions**

The situation does not clear automatically.

**KVM\_Server\_Critical\_Event situation****Description**

An error has occurred on the ESX server.

The situation is evaluated for each distinct value of Server\_Hostname.

**Formula**

\*IF \*VALUE KVM\_SUBNODE\_EVENTS.Entity\_Type \*EQ 'HostSystem' \*AND \*VALUE KVM\_SUBNODE\_EVENTS.Category \*EQ 'error'

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

None. Data is analyzed when it becomes available.

**Situation persistence**

Not Applicable

**Error conditions**

Critical

**Clearing conditions**

The situation does not clear automatically.

**KVM\_Server\_VM\_Critical\_Event situation****Description**

An error has occurred on the virtual machine.

The situation is evaluated for each distinct value of Virtual\_Machine.

**Formula**

\*IF \*VALUE KVM\_SUBNODE\_EVENTS.Entity\_Type \*EQ 'VirtualMachine' \*AND \*VALUE KVM\_SUBNODE\_EVENTS.Category \*EQ 'error'

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

None. Data is analyzed when it becomes available.

**Situation persistence**

Not Applicable

**Error conditions**

Critical

**Clearing conditions**

The situation does not clear automatically.

**KVM\_Server\_Datastore\_Free\_Low situation**

**Description**

The data store free space is low.

The situation is evaluated for each distinct value of the SH attribute.

**Formula**

```
*IF *VALUE KVM_SERVER_DATASTORE.Percent_Free *GE 0 *AND *VALUE
KVM_SERVER_DATASTORE.Percent_Free *LT 10
```

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Server\_HBA\_Fault situation****Description**

An ESX server host bus adapter has a fault.

The situation is evaluated for each distinct value of Device.

**Formula**

```
*IF *VALUE KVM_SERVER_HBA.Status *EQ 'fault'
```

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**Memory Navigator item****KVM\_VM\_Guest\_Memory\_Util\_High situation****Description**

The virtual machine guest memory usage is high.

The situation is evaluated for each distinct value of the VM\_NAME attribute.

**Formula**

```
*IF *VALUE KVM_VM_MEMORY.Guest_Util *GT 90
```

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_VM\_Host\_Memory\_Util\_High situation****Description**

The virtual machine host memory usage is high.

The situation is evaluated for each distinct value of the VM\_NAME attribute.

**Formula**

\*IF \*VALUE KVM\_VM\_MEMORY.Host\_Util \*GT 90

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**Network Navigator item****KVM\_Server\_Transmit\_Rate\_High situation****Description**

The transmit rate is high for the server.

The situation is evaluated for each distinct value of the SH attribute.

**Formula**

\*IF \*VALUE KVM\_SERVER\_NETWORK.Transmitted \*GT 5000

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.



**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Server\_Receive\_Rate\_High situation****Description**

The receive rate is high for the server.

The situation is evaluated for each distinct value of the SH attribute.

**Formula**

\*IF \*VALUE KVM\_SERVER\_NETWORK.Received \*GT 5000

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Server\_NIC\_Down situation****Description**

The host NIC adapter is not operational.

The situation is evaluated for each distinct value of NIC\_Name.

**Formula**

\*IF \*VALUE KVM\_SERVER\_NETWORK.Status \*EQ 'down' \*AND \*VALUE  
KVM\_SERVER\_NETWORK.Virtual\_Switch \*NE 'Unavailable'

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_VM\_Transmit\_Rate\_High situation****Description**

The transmit rate is high for the virtual machine.

The situation is evaluated for each distinct value of the VM\_NAME attribute.

**Formula**

\*IF \*VALUE KVM\_VM\_NETWORK.Transmitted \*GT 5000

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_VM\_Receive\_Rate\_High situation**

**Description**

The receive rate is high for the virtual machine.

The situation is evaluated for each distinct value of the VM\_NAME attribute.

**Formula**

\*IF \*VALUE KVM\_VM\_NETWORK.Received \*GT 5000

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**Resource Pools Navigator item**

**KVM\_Resource\_Pool\_CPU\_High situation**

**Description**

The CPU utilization is high.

The situation is evaluated for each distinct value of the SH attribute.

**Formula**

\*IF \*VALUE KVM\_RESOURCE\_POOL\_CPU.Percent\_Overall\_Usage \*GE 90

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Resource\_Pool\_Memory\_High situation****Description**

The memory utilization is high.

The situation is evaluated for each distinct value of the SH attribute.

**Formula**

\*IF \*VALUE KVM\_RESOURCE\_POOL\_MEMORY.Percent\_Overall\_Usage \*GE 90

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is automatically distributed to instances of this agent.

**Run at startup**

Yes

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**Virtual Machines Navigator item****KVM\_VM\_Powered\_Off situation****Description**

The virtual machine is powered off.

The situation is evaluated for each distinct value of the VM\_NAME attribute.

**Formula**

\*IF \*VALUE KVM\_VIRTUAL\_MACHINES.Power\_Status \*EQ 'poweredOff'

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Informational

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_Snapshots\_High situation****Description**

The number of snapshots is high.

The situation is evaluated for each distinct value of the VM\_NAME attribute.

**Formula**

\*IF \*VALUE KVM\_VIRTUAL\_MACHINES.Number\_Of\_Snapshots \*GE 32

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

**KVM\_VM\_Bad\_Status situation**

**Description**

The status of the virtual machine is not green.

The situation is evaluated for each distinct value of VM\_Name.

**Formula**

\*IF \*VALUE KVM\_VIRTUAL\_MACHINES.Overall\_Status \*NE 'Unavailable' \*AND \*VALUE KVM\_VIRTUAL\_MACHINES.Overall\_Status \*NE 'green'

See “Attributes in each attribute group” on page 37 for descriptions of the attributes in this formula.

**Distribution**

This situation is available for distribution.

**Run at startup**

No

**Sampling interval**

15 minutes

**Situation persistence**

The number of times the conditions of the situation must occur for the situation to be true is 1.

**Error conditions**

Warning

**Clearing conditions**

The situation clears when the condition becomes false.

---

## Chapter 6. Take Action commands reference

Take Action commands can be run from the portal client or included in a situation or a policy.

### About Take Action commands

When included in a situation, the command runs when the situation becomes true. A Take Action command in a situation is also referred to as *reflex automation*. When you enable a Take Action command in a situation, you automate a response to system conditions. For example, you can use a Take Action command to send a command to restart a process on the managed system or to send a text message to a cell phone.

In advanced automation, policies are used to take actions, schedule work, and automate manual tasks. A policy comprises a series of automated steps called activities that are connected to create a workflow. After an activity is completed, the Tivoli Enterprise Portal receives return-code feedback, and advanced automation logic responds with subsequent activities that are prescribed by the feedback.

A basic Take Action command shows the return code of the operation in a message box that is displayed after the action is completed or in a log file. After you close this window, no further information is available for this action.

### Additional information about Take Action commands

For more information about working with Take Action commands, see “Take Action commands” in the *Tivoli Enterprise Portal User’s Guide*.

For a list of the Take Action commands for this monitoring agent and a description of each command, see “Predefined Take Action commands” and the information for each individual command.

---

## Predefined Take Action commands

Not all agents have predefined Take Action commands. But you can create Take Action commands for any agent.

This monitoring agent contains the following Take Action commands:

- PowerOffVM
- PowerOnVM

---

## Take Action command descriptions

Each Take Action command description provides information you can use to decide whether to run the Take Action command or whether to include the Take Action command in a situation or a policy.

The descriptions of the Take Action commands provide the following information:

### Description

Actions the command performs on the system to which it is sent, and the permissions required for the Take Action command to function.

### Return codes

Information that the Take Action command returns.

## PowerOffVM action

This action attempts to power off a virtual machine. Two parameters are required for this action: the host name of the ESX server and the name of the virtual machine (the display name, not the virtual machine host name).

### System command

To include the Take Action command in a situation or workflow policy, use the following syntax for the system command:

```
POWEROFFVM \  
  
    [KVM_VIRTUAL_MACHINES.VM_Name]
```

You can use attribute substitution to supply the Take Action command arguments from the situation, for example:

```
POWEROFFVM \  
  
    [&{KVM_VIRTUAL_MACHINES.VM_Name}]
```

You can also use attribute substitution in a workflow policy though the format is slightly different:

```
POWEROFFVM \  
  
    [&WaitOnSituation:KVM_VIRTUAL_MACHINES.VM_Name]
```

### Command arguments

- **Name:** KVM\_VIRTUAL\_MACHINES.VM\_Name
  - **Description:** Name of the virtual machine to be powered off.
  - **Default:** ""

### Destination systems

\_EnDDESTINATIONS\_NONE\_OR\_LIST\_EnD

### Return codes

- Return Code: 8
  - Return Code Type: TIMED\_OUT
  - Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
  - Message ID: KVM1019
  - Message: WARNING::NO MESSAGE FOUND FOR THIS RETURN CODE!!!!
- Return Code: 12
  - Return Code Type: INSUFFICIENT\_USER\_AUTHORITY
  - Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
  - Message ID: KVM1020
  - Message: WARNING::NO MESSAGE FOUND FOR THIS RETURN CODE!!!!
- Return Code: 0
  - Return Code Type: OK
  - Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
  - Message ID: KVM5004I
  - Message: The request to power off the virtual machine was sent successfully.
- Return Code: 1
  - Return Code Type: NOT\_RUNNING
  - Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
  - Message ID: KVM5005I
  - Message: The virtual machine is powered off.
- Return Code: 2
  - Return Code Type: GENERAL\_ERROR
  - Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
  - Message ID: KVM5006E
  - Message: Could not perform the requested power off action.
- Return Code: 3
  - Return Code Type: GENERAL\_ERROR

- Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
- Message ID: KVM5007E
- Message: The ESX server name specified is invalid or could not be found.
- Return Code: 4
  - Return Code Type: GENERAL\_ERROR
  - Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
  - Message ID: KVM5008E
  - Message: One of the required parameters for this action was not specified.
- Return Code: 5
  - Return Code Type: GENERAL\_ERROR
  - Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
  - Message ID: KVM5009E
  - Message: An unknown action was specified for this request.
- Return Code: 6
  - Return Code Type: GENERAL\_ERROR
  - Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
  - Message ID: KVM5045E
  - Message: The specified virtual machine was not found.

## PowerOnVM action

This action attempts to power on a virtual machine. Two parameters are required for this action: the host name of the ESX server and the name of the virtual machine (the display name, not the virtual machine host name).

### System command

To include the Take Action command in a situation or workflow policy, use the following syntax for the system command:

```
POWERONVM \
    [KVM_VIRTUAL_MACHINES.VM_Name]
    [KVM_VIRTUAL_MACHINES.VM_Server_Name]
```

You can use attribute substitution to supply the Take Action command arguments from the situation, for example:

```
POWERONVM \
    [&{KVM_VIRTUAL_MACHINES.VM_Name}] \
    [&{KVM_VIRTUAL_MACHINES.VM_Server_Name}]
```

You can also use attribute substitution in a workflow policy though the format is slightly different:

```
POWERONVM \
    [&WaitOnSituation:KVM_VIRTUAL_MACHINES.VM_Name] \
    [&WaitOnSituation:KVM_VIRTUAL_MACHINES.VM_Server_Name]
```

### Command arguments

- **Name:** KVM\_VIRTUAL\_MACHINES.VM\_Name
  - **Description:** Name of the virtual machine to be powered on.
  - **Default:** ""
- **Name:** KVM\_VIRTUAL\_MACHINES.VM\_Server\_Name
  - **Description:** Name of the target virtual machine server.
  - **Default:** ""

### Destination systems

\_EnDDESTINATIONS\_NONE\_OR\_LIST\_EnD

### Return codes

- Return Code: 8
  - Return Code Type: TIMED\_OUT
  - Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
  - Message ID: KVM1019
  - Message: WARNING::NO MESSAGE FOUND FOR THIS RETURN CODE!!!!
- Return Code: 12
  - Return Code Type: INSUFFICIENT\_USER\_AUTHORITY
  - Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
  - Message ID: KVM1020
  - Message: WARNING::NO MESSAGE FOUND FOR THIS RETURN CODE!!!!
- Return Code: 0
  - Return Code Type: OK
  - Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
  - Message ID: KVM5001I
  - Message: The request to power on the virtual machine was sent successfully.
- Return Code: 1
  - Return Code Type: ALREADY\_RUNNING
  - Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
  - Message ID: KVM5002I
  - Message: The virtual machine is already powered on.
- Return Code: 2
  - Return Code Type: GENERAL\_ERROR
  - Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
  - Message ID: KVM5003E
  - Message: Could not perform the requested power on action.
- Return Code: 3
  - Return Code Type: GENERAL\_ERROR
  - Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
  - Message ID: KVM5007E
  - Message: The ESX server name specified is invalid or could not be found.
- Return Code: 4
  - Return Code Type: GENERAL\_ERROR
  - Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
  - Message ID: KVM5008E
  - Message: One of the required parameters for this action was not specified.
- Return Code: 5
  - Return Code Type: GENERAL\_ERROR
  - Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
  - Message ID: KVM5009E
  - Message: An unknown action was specified for this request.
- Return Code: 6
  - Return Code Type: GENERAL\_ERROR
  - Operating systems: [linux26,linux26\_zseries\_64,linux\_x86\_64,windows,wix64]
  - Message ID: KVM5045E
  - Message: The specified virtual machine was not found.



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## Chapter 7. Policies reference

Policies are used as an advanced automation technique for implementing more complex workflow strategies than you can create through simple automation. All agents do not provide predefined policies, but you can create policies for any agent.

A *policy* is a set of automated system processes that can take actions, schedule work for users, or automate manual tasks. You use the Workflow Editor to design policies. You control the order in which the policy executes a series of automated steps, which are also called *activities*. Policies are connected to create a workflow. After an activity is completed, the Tivoli Enterprise Portal receives return-code feedback, and advanced automation logic responds with subsequent activities prescribed by the feedback.

For more information about working with policies, see “Automation with policies” in the *Tivoli Enterprise Portal User’s Guide*.

For information about using the Workflow Editor, see the *IBM Tivoli Monitoring Administrator’s Guide* or the Tivoli Enterprise Portal online help.

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### Predefined policies

This monitoring agent contains predefined workflow policies that interact with Tivoli Application Dependency Discovery Manager systems to keep the VMware topology up-to-date between scheduled discoveries performed by the Tivoli Application Dependency Discovery Manager sensors.

All these predefined policies are, by default, configured to send requests to the Tivoli Application Dependency Discovery Manager system identified by the name of VMWARE-TADDM in IBM Tivoli Monitoring.

In order to create the VMWARE-TADDM Tivoli Application Dependency Discovery Manager system in IBM Tivoli Monitoring, see the instructions listed in the section on initialization of Tivoli Application Dependency Discovery Manager policies in the Tivoli Enterprise Portal User’s Guide.

After the VMWARE-TADDM Tivoli Application Dependency Discovery Manager system is created in IBM Tivoli Monitoring, complete the following steps to enable the predefined policies to run:

1. Click the **Workflow Editor** icon.
2. Select a VMware Workflow policy and select the **Auto start** check box.
3. Ensure the policy is configured.
4. To save your changes, click **OK** or **Apply**.

This monitoring agent contains the following policies:

- KVM\_VM\_Created
- KVM\_VM\_Deleted
- KVM\_VM\_Relocated
- KVM\_VMotion

### KVM\_VM\_Created

This policy sends a create request to Tivoli Application Dependency Discovery Manager when a new virtual machine is created.

The create request is sent so that the corresponding virtual machine CDM object is created in the Tivoli Application Dependency Discovery Manager database. This policy is triggered by the KVM\_Virtual\_Machine\_Created situation.

This policy includes two workflow activities:

**On Demand Report activity**

Used to collect additional information about the virtual machine being created that is not present in the situation processed, for example, the virtual machine name.

**Send a Tivoli Application Dependency Discovery Manager Update activity**

Used to send a create update to Tivoli Application Dependency Discovery Manager. The payload consists of the data contained in the situation processed and the data returned by the On Demand Report.

## **KVM\_VM\_Deleted**

This policy sends a delete request to Tivoli Application Dependency Discovery Manager when a new virtual machine is deleted.

The delete request is sent so that the corresponding virtual machine CDM object is deleted from the Tivoli Application Dependency Discovery Manager database. This policy is triggered by the KVM\_Virtual\_Machine\_Deleted situation.

This policy consists of a single workflow activity:

**Send a Tivoli Application Dependency Discovery Manager Update activity**

Used to send a delete update to Tivoli Application Dependency Discovery Manager. The payload consists of the data contained in the situation processed.

## **KVM\_VM\_Relocated**

This policy sends a move request to Tivoli Application Dependency Discovery Manager when a virtual machine disk storage is moved.

The move request is sent so that the virtualizes relationship of the corresponding virtual machine CDM object is updated in the Tivoli Application Dependency Discovery Manager database. This policy is triggered by the KVM\_Virtual\_Machine\_Relocated situation.

This policy consists of a single workflow activity:

**Send a Tivoli Application Dependency Discovery Manager Update activity**

Used to send a move update to Tivoli Application Dependency Discovery Manager. The payload consists of the data contained in the situation processed.

## **KVM\_VMotion**

This policy sends a move request to Tivoli Application Dependency Discovery Manager when a virtual machine is moved to execute somewhere else.

The move request is sent so that the virtualizes relationship of the corresponding virtual machine CDM object is updated in the Tivoli Application Dependency Discovery Manager database. This policy is triggered by the KVM\_Server\_VMotion situation.

This policy consists of a single workflow activity:

**Send a Tivoli Application Dependency Discovery Manager Update activity**

Used to send a move update to Tivoli Application Dependency Discovery Manager. The payload consists of the data contained in the situation processed.

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## Chapter 8. Troubleshooting

Problems can be related to IBM Tivoli Monitoring or the specific agent that you are using.

For general troubleshooting information, see the *IBM Tivoli Monitoring Troubleshooting Guide*. For other problem-solving options, see “Support information” on page 356.

You can resolve some problems by ensuring that your system matches the system requirements listed in the Prerequisites topic for the agent in the information center, or in the Requirements topic of the agent user's guide.

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

- “Gathering product information for IBM Software Support”
- “Using logging” on page 324
- “Consulting the lists of identified problems and workarounds” on page 324

### 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 2.

*Table 2. 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 325 for lists of all trace log files and their locations.  For general information about the IBM Tivoli Monitoring environment, see the <i>Tivoli Enterprise Portal User's Guide</i> .
VMware Virtual Center 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: <ul style="list-style-type: none"><li>• IBM Tivoli Monitoring. Also provide the patch level, if available.</li><li>• IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI</li></ul>
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 <i>install_dir/bin</i> directory, where <i>install_dir</i> 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 the “`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\\_\(general\)](http://www.ibm.com/support/entry/portal/Open_service_request/Software/Software_support_(general))).

## Using logging

Logging is the primary troubleshooting feature in the VMware VI agent. *Logging* refers to the text messages and trace data that is generated by the VMware VI 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 “Trace logging” 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 and configuration
- General usage and operation
- Display of monitoring data
- Take Action commands

Information about symptoms and detailed workarounds for these types of problems is located in “Problems and workarounds” on page 335.

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

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## 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 located in a logs subdirectory on the host computer. See the following information to learn how to configure and use trace logging:

- “Principal trace log files” on page 325
- “Examples: Using trace logs” on page 329
- “Setting RAS trace parameters by using the GUI” on page 330

**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 3 provides the names, locations, and descriptions of IBM Tivoli Monitoring general RAS1 log files. The log file names for the VMware VI agent adhere to the following naming convention:

### Windows systems

*hostname\_productcode\_instance-name\_program\_HEXtimestamp-nn.log*

### Linux and UNIX systems

*hostname\_productcode\_instance-name\_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 Monitoring for Virtual Environments Agent for VMware VI, the product code is vm.

*instance-name*

Instance name of the agent.

*program*

Name of the program being run.

*HEXtimestamp*

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

*nn*

Rolling log suffix.

## Principal trace log files

Trace log files are located on various systems.

Table 3 contains locations, file names, and descriptions of trace logs that can help determine the source of problems with agents.

Table 3. Trace log files for troubleshooting agents

System where log is located	File name and path	Description
On the Tivoli Enterprise Monitoring Server	<ul style="list-style-type: none"><li>• <b>Windows:</b> The IBM Tivoli Monitoring <i>timestamp.log</i> file in the <i>install_dir\InstallITM</i> path</li><li>• <b>UNIX:</b> The <i>candle_installation.log</i> file in the <i>install_dir/logs</i> path</li><li>• <b>Linux:</b> The <i>candle_installation.log</i> file in the <i>install_dir/logs</i> path</li></ul>	Provides details about products that are installed. <b>Note:</b> Trace logging is enabled by default. A configuration step is not required to enable this tracing.
On the Tivoli Enterprise Monitoring Server	The <i>Warehouse_Configuration.log</i> file is in the following location on Windows systems: <i>install_dir\InstallITM</i>	Provides details about the configuration of data warehousing for historical reporting.

Table 3. Trace log files for troubleshooting agents (continued)

System where log is located	File name and path	Description
On the Tivoli Enterprise Monitoring Server	<p>The name of the RAS log file is as follows:</p> <ul style="list-style-type: none"> <li>• <b>Windows:</b> <i>install_dir\logs\hostname_ms_timestamp-nn.log</i></li> <li>• <b>UNIX:</b> <i>install_dir/logs/hostname_ms_timestamp-nn.log</i></li> <li>• <b>Linux:</b> <i>install_dir/logs/hostname_ms_timestamp-nn.log</i></li> </ul> <p><b>Note:</b> File names for RAS1 logs include a hexadecimal time stamp.</p> <p>Also on UNIX systems, a log with a decimal time stamp is provided: <i>hostname_productcode_timestamp.log</i> and <i>hostname_productcode_timestamp.pid nnnnn</i> in the <i>install_dir/logs</i> path, where <i>nnnnn</i> is the process ID number.</p>	Traces activity on the monitoring server.
On the Tivoli Enterprise Portal Server	<p>The name of the RAS log file is as follows:</p> <ul style="list-style-type: none"> <li>• <b>Windows:</b> <i>install_dir\logs\hostname_cq_HEXtimestamp-nn.log</i></li> <li>• <b>UNIX:</b> <i>install_dir/logs/hostname_cq_HEXtimestamp-nn.log</i></li> <li>• <b>Linux:</b> <i>install_dir/logs/hostname_cq_HEXtimestamp-nn.log</i></li> </ul> <p><b>Note:</b> File names for RAS1 logs include a hexadecimal time stamp.</p> <p>Also on UNIX systems, a log with a decimal time stamp is provided: <i>hostname_productcode_timestamp.log</i> and <i>hostname_productcode_timestamp.pidnnnnn</i> in the <i>install_dir/logs</i> path, where <i>nnnnn</i> is the process ID number.</p>	Traces activity on the portal server.
On the Tivoli Enterprise Portal Server	<p>The teps_odbc.log file is located in the following path:</p> <ul style="list-style-type: none"> <li>• <b>Windows:</b> <i>install_dir\Install\ITM</i></li> <li>• <b>UNIX:</b> <i>install_dir/logs</i></li> <li>• <b>Linux:</b> <i>install_dir/logs</i></li> </ul>	When you enable historical reporting, this log file traces the status of the warehouse proxy agent.

Table 3. 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	<p>The RAS1 log files are as follows:</p> <ul style="list-style-type: none"> <li>• <b>VMware VI agent log:</b> <i>hostname_vm_instance_HEXtimestamp-nn.log.</i></li> <li>• <b>VMware VI Data Provider log:</b> : <i>kvm_data_provider_instance_n.log.</i></li> <li>• <b>Windows:</b> <i>hostname_vm_instance_name_kvmaagent_HEXtimestamp-nn.log</i> in the <i>install_dir\tmaitm6\logs</i> directory</li> <li>• <b>UNIX:</b> <i>hostname_vm_instance_name_kvmaagent_HEXtimestamp-nn.log</i> in the <i>install_dir/logs</i> directory</li> <li>• <b>Linux:</b> <i>hostname_vm_instance_name_kvmaagent_HEXtimestamp-nn.log</i> in the <i>install_dir/logs</i> directory</li> </ul> <p>These logs are in the following directories:</p> <ul style="list-style-type: none"> <li>• <b>Windows:</b> <i>install_dir\tmaitm6\logs</i></li> <li>• <b>UNIX:</b> <i>install_dir/logs</i></li> <li>• <b>Linux:</b> <i>install_dir/logs</i></li> </ul> <p>On Linux systems, the following additional logs are provided:</p> <ul style="list-style-type: none"> <li>– <i>hostname_vm_timestamp.log</i></li> <li>– <i>hostname_vm_timestamp.pidnnnnn</i> in the <i>install_dir/logs</i> path, where <i>nnnnn</i> is the process ID number</li> </ul>	Traces activity of the monitoring agent.

Table 3. 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	<p>The agent operations log files are as follows:</p> <p><i>instance_hostname</i>VM.LG0 is the current log created when the agent was started.</p> <p><i>instance_hostname</i>_VM.LG1 is the backup of the previous log.</p> <p>These logs are in the following directory depending on the operating system that you are using:</p> <ul style="list-style-type: none"> <li>• <b>Windows:</b> <i>install_dir</i>\tmaitm6\logs</li> <li>• <b>Linux:</b> <i>install_dir</i>/logs</li> <li>• <b>UNIX:</b> <i>install_dir</i>/logs</li> </ul>	<p>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.</p> <p>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 <i>previous</i> monitoring session:</p> <ul style="list-style-type: none"> <li>• Status of connectivity with the monitoring server</li> <li>• Situations that were running</li> <li>• The success or failure status of Take Action commands</li> </ul>
On the computer that hosts the monitoring agent	<p>The Take Action command log files are as follows:</p> <ul style="list-style-type: none"> <li>• <i>host_vm_instance_takeactioncommand</i>.log</li> </ul> <p>The logs are in the following directories:</p> <ul style="list-style-type: none"> <li>• <b>Windows:</b> <i>install_dir</i>\tmaitm6\logs</li> <li>• <b>UNIX:</b> <i>install_dir</i> /logs</li> <li>• <b>Linux:</b> <i>install_dir</i> /logs</li> </ul>	<p>Traces activity each time a Take Action command runs. For example, when a hypothetical <b>start_command</b> Take Action command runs, IBM Tivoli Monitoring generates a <i>start_command.log</i> file.</p>
On the computer that hosts the monitoring agent	<p>The Take Action command log files are as follows:</p> <ul style="list-style-type: none"> <li>• <i>kvm_data_provider_actions_instance_n</i>.log</li> </ul> <p>The logs are in the following directories:</p> <ul style="list-style-type: none"> <li>• <b>Windows:</b> <i>install_dir</i>\tmaitm6\logs</li> <li>• <b>UNIX:</b> <i>install_dir</i>/logs</li> <li>• <b>Linux:</b> <i>install_dir</i>/logs</li> </ul>	<p>Traces activity each time a Take Action command runs. All predefined Take Action commands are logged into this file.</p>
<p>Definitions of variables:</p> <ul style="list-style-type: none"> <li>• <i>timestamp</i> is a time stamp with a format that includes year (y), month (m), day (d), hour (h), and minute (m), as follows: <b>yyyymmdd hhmm</b></li> <li>• <i>HEXtimestamp</i> is a hexadecimal representation of the time at which the process was started.</li> <li>• <i>install_dir</i> represents the directory path where you installed the IBM Tivoli Monitoring component. <i>install_dir</i> can represent a path on the computer that hosts the monitoring system, the monitoring agent, or the portal.</li> <li>• <i>instance</i> refers to the name of the database instance that you are monitoring.</li> <li>• <i>instance_name</i> refers to the name of the agent instance.</li> <li>• <i>hostname</i> refers to the name of the computer on which the IBM Tivoli Monitoring component runs.</li> <li>• <i>nn</i> 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.</li> <li>• <i>productcode</i> specifies the product code, for example, um for Universal Agent or nt for Windows systems.</li> </ul>		



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*.

## Examples: Using trace logs

You can open trace logs in a text editor to learn some basic facts about your IBM Tivoli Monitoring environment.

IBM Software Support applies specialized knowledge to analyze trace logs to determine the source of problems. The following examples are from the Tivoli Enterprise Monitoring Server log.

### Example one

This excerpt shows the typical log for a failed connection between a monitoring agent and a monitoring server with the host name **server1a**:

```
(Thursday, August 11, 2005, 08:21:30-{94C}kdc10cl.c,105,"KDCL0_ClientLookup") status=1c020006,
"location server unavailable", ncs/KDC1_STC_SERVER_UNAVAILABLE
(Thursday, August 11, 2005, 08:21:35-{94C}kraarreg.cpp,1157,"LookupProxy") Unable to connect to
broker at ip.pipe:: status=0, "success", ncs/KDC1_STC_OK
(Thursday, August 11, 2005, 08:21:35-{94C}kraarreg.cpp,1402,"FindProxyUsingLocalLookup") Unable
to find running CMS on CT_CMSLIST <IP.PIPE:#server1a>
```

### Example two

The following excerpts from the trace log *for the monitoring server* show the status of an agent, identified here as "Remote node." The name of the computer where the agent is running is **SERVER5B**:

```
(42C039F9.0000-6A4:kpxreqhb.cpp,649,"HeartbeatInserter") Remote node SERVER5B:VM is ON-LINE.
. . .
(42C3079B.0000-6A4:kpxreqhb.cpp,644,"HeartbeatInserter") Remote node SERVER5B:VM is OFF-LINE.
```

See the following key points about the preceding excerpts:

- The monitoring server appends the **VM** product code to the server name to form a unique name (SERVER5B:VM ) for this instance of the IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI. By using this unique name, you can distinguish multiple monitoring products that might be running on **SERVER5B**.
- The log shows when the agent started (ON-LINE) and later stopped (OFF-LINE) in the environment.
- For the sake of brevity, an ellipsis (...) represents the series of trace log entries that were generated while the agent was running.
- Between the ON-LINE and OFF-LINE log entries, the agent was communicating with the monitoring server.
- The ON-LINE and OFF-LINE log entries are always available in the trace log. All trace levels that are described in "Setting RAS trace parameters by using the GUI" on page 330 provide these entries.

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

1. In the Windows **Start** menu, click **Program Files > IBM Tivoli Monitoring > Manage Tivoli Enterprise Monitoring Services**. The Manage Tivoli Enterprise Monitoring Services window is displayed.
2. Right-click a component and click **Advanced > View Trace Log** in the menu. For example, if you want to view the trace log of the IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI, right-click the name of that agent in the window. You can also use the viewer to access remote logs.

**Note:** The viewer converts time stamps in the logs to a format that is easier to read.

**Note:** The `kvmvici` log is not listed in the Manage Tivoli Enterprise Monitoring Services **View Trace Log** option. Each instance of the Monitoring Agent for VMware VI creates 2 log files:

- The `kvmagent` log, `hostname_vm_instance_HEXtimestamp-nn.log`, shows in the Windows Manage Tivoli Enterprise Monitoring Services interface when you right-click on the Monitoring Agent for VMware VI instance and select **Advanced - View Trace Log**.
- The `kvmvici` log, `hostname_vm_kvmvici_HEXtimestamp-nn.log`, is not listed. This log is created by the VMware VI custom data provider, and typically contains the most useful information.

## 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 324 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 Monitoring for Virtual Environments Agent for VMware VI uses RAS1 tracing and generates the logs described in Table 3 on page 325. The default RAS1 trace level is ERROR.

#### Procedure

1. Open the Manage Tivoli Enterprise Monitoring Services window.
  2. Select **Advanced > Edit Trace Params**. 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:kvm ALL)`
    - Maximum error tracing. `KBB_RAS1=ERROR (UNIT:kvm 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 3 on page 325 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.

## Manually setting RAS trace parameters

You can manually edit the RAS1 trace logging parameters.

### About this task

The VMware VI agent uses RAS1 tracing and generates the logs described in Table 3 on page 325. The default RAS1 trace level is ERROR.

### Procedure

1. Open the trace options file:
  - **Windows systems:**  
`install_dir\tmaitm6\KVMENV_instance name`
  - **UNIX systems:**  
`install_dir /config/vm_instance name.config`
2. Edit the line that begins with **KBB\_RAS1=** to set trace logging preferences. For example, if you want detailed trace logging, set the **Maximum Tracing** option: **KBB\_RAS1=ERROR (UNIT:kvm ALL) (UNIT:kra ALL)**
3. Edit the line that begins with **KBB\_RAS1\_LOG=** to manage the generation of log files:
  - **MAXFILES:** The total number of files that are to be kept for all startups of a specific program. When this value is exceeded, the oldest log files are discarded. The default value is 9.
  - **LIMIT:** The maximum size, in megabytes (MB) of a RAS1 log file. The default value is 5.
  - IBM Software Support might guide you to modify the following parameters:
    - **COUNT:** The number of log files to keep in the rolling cycle of one program startup. The default is 3.
    - **PRESERVE:** The number of files that are not to be reused in the rolling cycle of one program startup. The default value is 1.

**Note:** The **KBB\_RAS1\_LOG** parameter also provides for the specification of the log file directory, log file name, and the inventory control file directory and name. Do not modify these values or log information can be lost.

4. Restart 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 3 on page 325 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.

## Dynamic modification of trace settings

You can dynamically modify the trace settings for an IBM Tivoli Monitoring component, such as, Tivoli Enterprise Monitoring Server, Tivoli Enterprise Portal Server, most monitoring agents, and other components. You can access these components, except for a few monitoring agents, from the tracing utility.

Dynamic modification of the trace settings is the most efficient method, because you can do it without restarting the component. Settings take effect immediately. Modifications by this method are not persistent.

**Note:** When the component is restarted, the trace settings are read again from the .env file. Dynamically modifying these settings does not change the settings in the .env files. To modify these trace settings permanently, modify them in the .env files.

### ras1

Run this command to modify the trace settings for a Tivoli Monitoring component.

The syntax is as follows:

```
ras1 set|list (UNIT|COMP: class_name ANY|ALL|Detail|ERROR|Flow|INPUT|Metrics|OUTPUT|STATE)
{(UNIT|COMP: class_name ANY|ALL|Detail|ERROR|Flow|INPUT|Metrics|OUTPUT|STATE)}
```

You can specify more than one component class to which to apply the trace settings.

## Command options

### set

Turns on or off tracing depending upon the value of its parameters. If the parameter is **ANY**, it turns it off. All other parameters turn on tracing based on the specified type or level.

### list

Displays the default level and type of tracing that is set by default.

## Parameters

The parameters that determine the component classes to which to apply the trace settings are as follows:

### COMP: *class\_name*

Modifies the trace setting for the name of the component class, as specified by *class\_name*, for example, COMP:KDH. The output contains trace for the specified class.

### UNIT: *class\_name*

Modifies the trace setting for any unit that starts with the specified *class\_name* value, for example, UNIT: kra. The output contains trace for any unit that begins with the specified filter pattern.

The parameters that determine the trace level and type are as follows:

#### **ALL**

Displays all trace levels, including every trace point defined for the component. This setting might result in a large amount of trace, so specify other parameters to exclude unwanted trace. You might require the **ALL** parameter to isolate a problem, which is the equivalent to setting "Error Detail Flow State Input Output Metrics".

#### **ANY**

Turns off tracing.

#### **Detail**

Displays detailed information about each function.

When entered with the `list` option, the trace is tagged with `Det`.

#### **ERROR**

Logs internal error conditions.

When entered with the `list` option, the trace is tagged with `ER`. The output can also be tagged with `EVERYE+EVERYU+ER`.

#### **Flow**

Displays control flow data for each function entry and exit.

When entered with the `list` option, the trace is tagged with `Fl`.

#### **INPUT**

Displays input data for each function.

When entered with the `list` option, the trace is tagged with `IN`.

#### **Metrics**

Displays metrics on each function.

When entered with the `list` option, the trace is tagged with `ME`.

#### **OUTPUT**

Displays output data for each function.

When entered with the `list` option, the trace is tagged with `OUT`.

#### **State**

Displays the status for each function.

When entered with the `list` option, the trace is tagged with `St`.

## **Example**

If you enter `ras1 set (COMP:KDH ALL) (COMP:ACF1 ALL) (COMP:KDE ALL)`, the trace utility turns on all levels of tracing for all the files and functions for which KDH, ACF1, and KDE are the classes.

```
kbbcre1.c, 400, May 29 2007, 12:54:43, 1.1, *
kbbcrn1.c, 400, May 29 2007, 12:54:42, 1.1, *
kdhb1de.c, 400, May 29 2007, 12:59:34, 1.1, KDH
kdh0med.c, 400, May 29 2007, 12:59:24, 1.1, KDH
kdhsrej.c, 400, May 29 2007, 13:00:06, 1.5, KDH
kdhb1fh.c, 400, May 29 2007, 12:59:33, 1.1, KDH
kdhb1oe.c, 400, May 29 2007, 12:59:38, 1.2, KDH
kdhs1ns.c, 400, May 29 2007, 13:00:08, 1.3, KDH
kbbacd1.c, 400, May 29 2007, 12:54:27, 1.2, ACF1
kbbac1c.c, 400, May 29 2007, 12:54:27, 1.4, ACF1
kbbac1i.c, 400, May 29 2007, 12:54:28, 1.11, ACF1
vkdhscfn.c, 400, May 29 2007, 13:00:11, 1.1, KDH
kdhserq.c, 400, May 29 2007, 12:59:53, 1.1, KDH
kdhb1pr.c, 400, May 29 2007, 12:59:39, 1.1, KDH
kdhsgh.c, 400, May 29 2007, 12:59:49, 1.1, KDH
```

```
kdh0uts.c, 400, May 29 2007, 12:59:23, 1.1, KDH
kdhsrsp.c, 400, May 29 2007, 13:00:13, 1.2, KDH
kdhs1rp.c, 400, May 29 2007, 13:00:12, 1.1, KDH
kdhscsv.c, 400, May 29 2007, 12:59:58, 1.9, KDH
kdebbac.c, 400, May 29 2007, 12:56:50, 1.10, KDE
...
```

## Turning on tracing

To use the tracing utility, you must use a local logon credential for the computer. This tracing method uses the IBM Tivoli Monitoring Service Console. Access the Service Console by using a web browser.

### About this task

When you start the Service Console, information is displayed about the components that are currently running on that computer. For example, these components are listed as follows:

- Tivoli Enterprise Portal Server: `cnp`
- Monitoring Agent for Windows OS: `nt`
- Tivoli Enterprise Monitoring Server: `ms`

After you log on, you can type a question mark (?) to display a list of the supported commands. Use the **ras1** command to modify trace settings. If you type this command in the field provided in the Service Console window and click **Submit**, the help for this command is displayed.

### Procedure

1. Open a web browser and enter the URL to access the Service Console.

```
http://hostname:1920
```

where *hostname* is the IP address or host name of the computer on which the IBM Tivoli Monitoring component is running.

2. Click the hyperlink associated with the component for which you want to modify its trace settings.

**Note:** In the previous view, if you want to modify tracing for the Tivoli Enterprise Monitoring Server, select **IBM Tivoli Monitoring Service Console** under **Service Point: system.your host name\_ms**.

3. Enter a user ID and password to access the system. This ID is any valid user that has access to the system.
4. Enter the command to turn on the required level of trace for the specified component classes or units.

```
ras1 set (UNIT|COMP: class_name ALL|Flow|ERROR|Detail|INPUT|Metrics|OUTPUT|STATE)
{(UNIT|COMP: class_name ALL|Flow|ERROR|Detail|INPUT|Metrics|OUTPUT|STATE)}
```

For example, to turn on the control flow trace for the KDE, the command is:

```
ras1 (COMP:KDE Flow)
```

## Turning off tracing

You can use the IBM Tivoli Monitoring Service Console to run the **ras1** command and dynamically turn off tracing.

### Procedure

1. Open a web browser and enter the URL to access the Service Console.

```
http://hostname:1920
```

where *hostname* is the IP address or host name of the computer on which the IBM Tivoli Monitoring component is running.

2. Click the hyperlink associated with the component for which you want to modify its trace settings.

3. Enter a user ID and password to access the system. This ID is any valid user that has access to the system.
4. Enter the command to turn off the required level of trace for the specified component classes or units.  

```
rasl set (UNIT|COMP: class_name ANY)
{(UNIT|COMP: class_name ANY)}
```

For example, to turn off tracing for the kbbcrd class of the Windows OS agent, the command is:

```
rasl set (UNIT:kbbcrd ANY)
```

## Setting trace parameters for the Tivoli Enterprise Console server

In addition to the trace information captured by IBM Tivoli Monitoring, you can also collect additional trace information for the Tivoli Enterprise Console components that gather event server metrics.

### About this task

To collect this information, modify the `.tec_diag_config` file on the Tivoli Enterprise Console event server. Use the steps in the following procedure to modify the event server trace parameters.

### Procedure

1. Open the `$BINDIR/TME/TEC/.tec_diag_config` file in an ASCII editor.
2. Locate the entries that configure trace logging for the agent components on the event server. Two entries are included, one for `tec_reception` and one for `tec_rule`:

```
# to debug Agent Utils
tec_reception Agent_Utils  error  /tmp/tec_reception
SP
# to debug Agent Utils
tec_rule Agent_Utils  error  /tmp/tec_rule
```

3. To gather additional trace information, modify these entries to specify a trace level of `trace2`:

```
# to debug Agent Utils
tec_reception Agent_Utils  trace2  /tmp/tec_reception
SP
# to debug Agent Utils
tec_rule Agent_Utils  trace2  /tmp/tec_rule
```

4. In addition, modify the `Highest_level` entries for `tec_rule` and `tec_reception`:

```
tec_reception Highest_level  trace2
SP
tec_rule Highest_level trace2
```

---

## Problems and workarounds

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

**Note:** You can resolve some problems by ensuring that your system matches the system requirements listed in the Prerequisites topic for the agent in the IBM Tivoli Monitoring for Virtual Environments Information Center.

**Note:** You can resolve some problems by ensuring that your system matches the system requirements listed in Agent installation and configuration.

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.



The problems and solutions in Table 4 can occur during installation, configuration, and uninstallation of the agent.

Table 4. Problems and solutions for installation and configuration

Problem	Solution
<p>(UNIX only) During a command-line installation, you choose to install a component that is currently installed, and you see the following warning: WARNING - you are about to install the SAME version of <i>component_name</i> where <i>component_name</i> is the name of the component that you are attempting to install.</p> <p><b>Note:</b> This problem affects UNIX command-line installations. If you monitor only Windows environments, you see this problem if you choose to install a product component (for example, a monitoring server) on a UNIX system.</p>	<p>You must exit and restart the installation process. You cannot return to the list where you selected components to install. When you run the installer again, do not attempt to install any component that is currently installed.</p>
<p>Diagnosing problems with product browse settings (Windows systems only).</p>	<p>When you have problems with browse settings, complete the following steps:</p> <ol style="list-style-type: none"> <li>1. Click <b>Start &gt; Programs &gt; IBM Tivoli Monitoring &gt; Manage Tivoli Enterprise Monitoring Services</b>. The Manage Tivoli Enterprise Monitoring Services window is displayed.</li> <li>2. Right-click the Windows agent and select <b>Browse Settings</b>. A text window is displayed.</li> <li>3. Click <b>Save As</b> and save the information in the text file.</li> </ol> <p>If requested, you can forward this file to IBM Software Support for analysis.</p>
<p>A message similar to "Unable to find running CMS on CT_CMSLIST" in the log file is displayed.</p>	<p>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:</p> <ul style="list-style-type: none"> <li>• Do multiple network interface cards (NICs) exist on the system?</li> <li>• 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.</li> </ul>
<p>The system is experiencing high CPU usage.</p>	<p><b>Agent process:</b> View the memory usage of the KVMCMA process. If CPU usage seems to be excessive, restart the monitoring agent.</p> <p><b>Network cards:</b> 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.</p>



Table 4. Problems and solutions for installation and configuration (continued)

Problem	Solution
Data source certificate is lost after upgrading from version 6.1 of the VMware agent to a later version.	Certificates in configured data sources must be added again after upgrading to display data in the Tivoli Enterprise Portal.
While installing the VMware agent in silent mode where a <i>candle_home</i> directory already exists, the InstallShield application (installer) ignores the path of the installation directory mentioned in the response file (Windows systems only).	If any IBM Tivoli Monitoring component is already installed on a computer using Windows, all subsequent IBM Tivoli Monitoring installations go into the existing <i>candle_home</i> directory, regardless of what you specify.
Installation on RHEL Linux 64-bit systems uses the <b>install.sh</b> command script. Running this script fails with a runGSKit failure: Return error code: 99.	<p>GSKit is called by <b>install.sh</b> and fails when runGSKit calls verifyInstall. Review the &lt;InstallDirectory&gt;/logs/candle_installation.log file and look for references to runGSKit.</p> <p>For example, output similar to the following might be present:</p> <pre>runGSKit: ----- Running command: /opt/IBM/ITM/li6243/gs/bin/private_verifyinstall /opt/IBM/ITM/li6243/gs/bin/gsk7ver: error while loading shared libraries: libstdc++.so.5: cannot open shared object file: No such file or directory Error: Verify Failed Expected Details of gskit in /opt/IBM/ITM/li6243/gs runGSKit: return code from command is 99 runGSKit: ----- End of running command ----- runGSKit: error Return error code: 99 runGSKit: error GSKit check failure, script: /opt/IBM/ITM/li6243/gs/bin/private_verifyinstall runGSKit: error li6243 - GSK check error, verifyInstall test failed</pre> <p>In the previous example, the 32-bit version of the libstdc++.so.5 file is not present. This file comes from the compat-libstdc++-33-3.2.3-XX.i686.rpm package, which is not installed on 64-bit RHEL systems by default. When this package is installed, the problem no longer occurs.</p>
After installation, the VMware VI agent instance fails to start. The following message is displayed in the agent log: (4CF55620.003F-1:kbbssge.c,52,"BSS1_GetEnv") KBB_SIG1="-asyncoff -syncoff -dumpoff" (4CF55620.0040-1:signalmanager.cpp,170, "startManagerThread") Error starting signal manager thread. Return code = 11; Resource temporarily unavailable. Use the return code and message to investigate the failure. Agent is terminating.	The probable cause of the problem is the public domain Korn shell, <b>pdksh</b> . Uninstall the <b>pdksh</b> shell and install the <b>ksh</b> rpm that is included on the Linux installation media.

Table 4. 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.	<p>Check the GL component version by running <code>kincinfo -t GL</code> from a Windows command line. Example:</p> <pre>%CANDLE_HOME%\Install\ITM\kincinfo -t GL</pre> <p>If the GL component version is 06.23.00.00 or 06.23.01.00, take one of the following actions:</p> <ul style="list-style-type: none"> <li>• <b>Preferred action:</b> Upgrade the Windows OS Agent to Version 6.2.3 Fix Pack 2.</li> <li>• <b>Alternate action:</b> 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 (<a href="http://pic.dhe.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.itm.doc_6.2.3fp1/itm623FP1_install199.htm#acpinstall">http://pic.dhe.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.itm.doc_6.2.3fp1/itm623FP1_install199.htm#acpinstall</a>).</li> </ul>
<p>When you run the prerequisite checker on a computer with the Linux operating system where the instance of VMware VI agent is running, the result displays the memory requirement for the VMware VI agent as 512 MB.</p> <p><b>Note:</b> The expected memory requirement for the Linux operating system must be 0 MB when an instance of the VMware VI agent is running. The memory requirement for the Linux operating system must be 512 MB when the VMware VI agent instance is not running.</p>	No solution is available for this problem.

Table 5. General problems and solutions for uninstallation

Problem	Solution
On Windows systems, uninstallation of IBM Tivoli Monitoring fails to uninstall the entire environment.	<p>Be sure that you follow the general uninstallation process described in the <i>IBM Tivoli Monitoring Installation and Setup Guide</i>:</p> <ol style="list-style-type: none"> <li>1. Remove Tivoli Enterprise Monitoring Server Application support by completing the following steps: <ol style="list-style-type: none"> <li>a. Use Manage Tivoli Enterprise Monitoring Services.</li> <li>b. Select <b>Tivoli Enterprise Monitoring Server</b>.</li> <li>c. Right-click and select <b>Advanced</b>.</li> <li>d. Select <b>Remove TEMS application support</b>.</li> <li>e. Select the agent to remove its application support.</li> </ol> </li> <li>2. Uninstall the monitoring agents first, as in the following examples: <ul style="list-style-type: none"> <li>• Uninstall a single monitoring agent for a specific database.</li> <li>-OR-</li> <li>• Uninstall all instances of a monitoring product, such as IBM Tivoli Monitoring for Databases.</li> </ul> </li> <li>3. Uninstall IBM Tivoli Monitoring.</li> </ol>

Table 5. General problems and solutions for uninstallation (continued)

Problem	Solution
The way to remove inactive managed systems (systems whose status is OFFLINE) from the Navigator tree in the portal is not obvious.	<p>Use the following steps to remove, but not uninstall, an offline managed system from the Navigator tree:</p> <ol style="list-style-type: none"> <li>1. Click the <b>Enterprise</b> icon in the Navigator tree.</li> <li>2. Right-click, and then click <b>Workspace &gt; Managed System Status</b>.</li> <li>3. Right-click the offline managed system, and select <b>Clear offline entry</b>.</li> </ol> <p>To uninstall the monitoring agent, use the procedure described in the <i>IBM Tivoli Monitoring Installation and Setup Guide</i>.</p>
IBM Tivoli Monitoring might not be able to generate a unique name for monitoring components because of the truncation of names that the product automatically generates.	<p>If the agent supports multiple instances, IBM Tivoli Monitoring automatically creates a name for each monitoring component by concatenating the subsystem name, host name, and product code separated by colons (<i>subsystem_name:hostname:KVM</i>).</p> <p><b>Note:</b> When you monitor a multinode system, such as a database, IBM Tivoli Monitoring adds a subsystem name to the concatenated name, typically a database instance name.</p> <p>The length of the name that IBM Tivoli Monitoring generates is limited to 32 characters. Truncation can result in multiple components having the same 32-character name. If this problem happens, shorten the <i>hostname</i> portion of the name as follows:</p> <ol style="list-style-type: none"> <li>1. Open the configuration file for the monitoring agent, which is located in the following path: <ul style="list-style-type: none"> <li>• <b>On Windows:</b> <i>install_dir\tmaitm6\Kproduct_codeCMA.INI</i>. For example, the product code for the Monitoring Agent for Windows OS is NT. The file name is KNTCMA.INI.</li> <li>• <b>On UNIX and Linux:</b> <i>itm_home/config/product_code.ini</i> and <i>product_code.config</i>. For example, the file names for the Monitoring Agent for UNIX OS is <i>ux.ini</i> and <i>ux.config</i>.</li> </ul> </li> <li>2. Find the line that begins with CTIRA_HOSTNAME=.</li> <li>3. Type a new name for host name that is a unique, shorter name for the host computer. The final concatenated name including the subsystem name, new host name, and KVM, cannot be longer than 32 characters. <p><b>Note:</b> You must ensure that the resulting name is unique with respect to any existing monitoring component that was previously registered with the Tivoli Enterprise Monitoring Server.</p> </li> <li>4. Save the file.</li> <li>5. Restart the agent.</li> </ol>

Table 5. General problems and solutions for uninstallation (continued)

Problem	Solution
<p>When configuring multiple instances of the monitoring agent, multiple instances that have the same instance name and monitor the same ESX Server (directly or through a Virtual Center) do not have a unique ESX subnode name created. Only one of the instances is displayed in the Tivoli Enterprise Portal.</p> <p>For example: Instance ABC on Host1 monitors ESX1. Instance ABC on Host2 monitors the VC that Manages ESX1 Both instances have an ESX subnode called VM:ABC-ESX1:ESX.</p>	<p>During configuration of an instance, ensure that the instance name is unique. For example, include the host name of the system in the instance name.</p>
<p>The software inventory tag for the agent on UNIX and Linux systems is not removed during uninstallation of the agent.</p>	<p>After uninstalling the agent, manually remove the file named <i>full name of agent.cmptag</i> from the \$CANDLEHOME/properties/version/ directory.</p>
<p>When configuring multiple instances of the monitoring agent, multiple instances that have the same instance name and monitor the same ESX Server (directly or through a Virtual Center) do not have a unique ESX subnode name created. Only one of the instances is displayed in the Tivoli Enterprise Portal.</p> <p>For example: Instance ABC on Host1 monitors ESX1. Instance ABC on Host2 monitors the VC that Manages ESX1 Both instances have an ESX subnode called VM:ABC-ESX1:ESX.</p>	<p>During configuration of an instance, ensure that the instance name is unique. For example, include the host name of the system in the instance name.</p>
<p>After installation, the VMware VI agent instance fails to start. The following message appears in the agent log:</p> <pre>(4CF55620.003F-1:kbssge.c,52,"BSS1_GetEnv") KBB_SIG1="-asyncoff -syncoff -dumpoff" (4CF55620.0040-1:signalmanager.cpp,170, "startManagerThread") Error starting signal manager thread. Return code = 11; Resource temporarily unavailable. Use the return code and message to investigate the failure. Agent is terminating.</pre>	<p>The probable cause of the problem is the public domain Korn shell, <b>pdksh</b>. Uninstall the <b>pdksh</b> shell and install the <b>ksh</b> rpm that is included on the Linux installation media.</p>

Table 5. General problems and solutions for uninstallation (continued)

Problem	Solution
<p>When the agent is installed using group deployment, deploygroup was run multiple times. The group deployment starts and completes successfully, but there were multiple entries in the Deploy Status Summary workspace on the Tivoli Enterprise Portal. When the command tried to install multiple times, the additional installations were queued and then were in failed state though the agent was deployed successfully.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• When the bundle group contains a single bundle and the deployment group contains more than one member (managed system of the same type as AIX® or Linux), the deployment is successful on both systems.</li> <li>• When the bundle group contains more than one bundle and the deploy group contains single or multiple members, the deployment will be executed on each group member (managed system) depending on the members present in the bundle group and deploy group.</li> <li>• The command creates a transaction for each XX bundle for each target system; the bundle matching the operating system for the deployment member is processed successfully; and remaining transactions were in a queued or failed state.</li> </ul>	<p>There is no solution at this time.</p>

## Remote deployment troubleshooting

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

Table 6 contains problems and solutions related to remote deployment.

Table 6. Remote deployment problems and solutions

Problem	Solution
<p>While you are using the remote deployment feature to install the IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI, 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 <i>IBM Tivoli Monitoring Installation and Setup Guide</i>.)</p>	<p>Do not close or modify this window. It is part of the installation process and is dismissed automatically.</p>
<p>The removal of a monitoring agent fails when you use the remote removal process in the Tivoli Enterprise Portal desktop or browser.</p>	<p>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.</p>

Table 6. Remote deployment problems and solutions (continued)

Problem	Solution
Remote deployment reports success, but the VMware VI agent does not connect to the Tivoli Enterprise Monitoring Server. Also, the agent is deployed to the Tivoli Enterprise Monitoring Agent, but cannot be started locally.	Instance names can be 1 – 32 characters in length, and only alphanumeric characters are allowed. (a-z A-Z and 0-9). No spaces, dashes, underscores, or other characters are allowed. Illegal characters in the instance name cause the deployed agent to be nonfunctional.
Remote deployment in silent mode fails if Instance Name contains illegal characters. No windows are displayed and success is claimed, but the remote instance does not start. Manually restarting the agent on the remote computer gives the following error: “Unable to start service, see EventLog for information”. No trace is generated.	
The remotely deployed VMware VI agent instance is deployed and the instance connects to the Tivoli Enterprise Monitoring Server, but no ESX server subnodes are discovered.	The SSL signer certificate for the data source must be added to the <code>kvm.truststore</code> file on the agent system to be able to connect to the data source using SSL.
The VMware VI agent is configured to communicate with the data source using <code>SSL=YES</code> .	
The remotely deployed VMware VI agent instance is deployed and the instance connects to the Tivoli Enterprise Monitoring Server, but no ESX server subnodes are discovered.	By default, VMware Virtual Infrastructure only supports using the <code>https</code> (SSL) protocol for communication. See your VMware Virtual infrastructure documentation for details about Enabling <code>http</code> (non-SSL) access on the VMware Virtual Center or ESX Server.
The VMware VI agent is configured to communicate with the data source using <code>SSL=NO</code> .	
No option is available to remotely deploy a second instance of the VMware VI agent to Windows systems through the portal.	Use the command line to remotely deploy a second instance of the VMware VI agent.
Remote deployment of the agent to a 64-bit Windows server fails with a time out problem. Subsequent retries fail with a file not transmitted error.	The 64-bit Window OS agent was installed at the endpoint using the IBM Tivoli Monitoring local installer instead <b>createNode</b> command. If an <b>addSystem</b> command is used to deploy a 64-bit agent, the installation process loops continuously. This looping is caused by a perceived 32/64 bit compatibility (AC) component not being installed correctly. The install process running at the endpoint must be manually terminated. The remote deployment can now be executed by installing the AC component either locally or remotely. The agent can now be successfully deployed by running the <b>addSystem</b> command. If the agent installation is done locally, a pop-up menu is displayed indicating the 32/64 compatability component must be installed.

## Agent troubleshooting

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

Table 7 on page 343 contains problems and solutions that can occur with the agent after it is installed.

Table 7. Agent problems and solutions

Problem	Solution
Log data accumulates too rapidly.	Check the RAS trace option settings, which are described in “Setting RAS trace parameters by using the GUI” on page 330. The trace option settings that you can set on the KBB_RAS1= and KDC_DEBUG= lines potentially generate large amounts of data.
The VMware VI agent connects to the Tivoli Enterprise Monitoring Server, and is displayed in the Tivoli Enterprise Portal navigation tree, but only the top-level nodes are displayed: VMware VI Agent, Monitored Servers, and Events. No Monitored Servers are discovered and no ESX Server subnodes are displayed in the navigation tree.	Verify the environment variable: 1. Verify that the <b>KFW_TOPOLOGY_MUST_USE_FULL_NAME_AFFINITIES</b> environment variable has been added to the Tivoli Enterprise Portal Server Environment Configuration File and the Tivoli Enterprise Portal Server has been restarted.
No row is displayed in the Agent Events table stating that an SSL error occurred in the Connection subsystem.	2. See Chapter 2, “Agent installation and configuration,” on page 7.
The VMware VI agent connects to the Tivoli Enterprise Monitoring Server, and is displayed in the Tivoli Enterprise Portal navigation tree, but only the top-level nodes are displayed: VMware VI Agent, Monitored Servers, and Events. No Monitored Servers are discovered and no ESX Server subnodes are displayed in the navigation tree.	Verify SSL enablement: 1. Verify that the VMware data source certificates have been added to the certificate truststore for the agent. 2. Use the <b>keytool -list</b> command to see the certificates that have been added to the certificate truststore for the agent.
A row is displayed in the Agent Events table stating that an SSL error occurred in Connection subsystem.	Windows: <code>keytool -list -v -keystore %CANDLE_HOME%\tmaitm6\kvm.truststore -storepass ITVMWAREVI</code>  Linux: <code>keytool -list -v -keystore install_dir/li6263/vm/etc/kvm.truststore -storepass ITVMWAREVI</code>  See “Enabling SSL communication with VMware VI data sources” on page 12 for additional information.
Informational log entries are displayed in the Virtual Center System Log (vxpd) when requesting data from the Virtual Center through the Virtual Infrastructure API.	These entries can be eliminated by selecting only log warnings and errors; otherwise, these information logs accumulate and can cause the log to wrap more than is typical.
The VMware VI agent is configured not to use SSL. No ESX Subnodes are discovered.	By default, VMware Virtual infrastructure only supports using the https (SSL) protocol for communication. See your VMware Virtual infrastructure documentation for details on Enabling http (non-SSL) access.
The log for the Monitoring Agent for VMware VI has many occurrences of “Received a NULL SNTEntry for subnode <i>ESX Managed System Name</i> . Skipping.”	This message is an indication that data was received from a Virtual Center for an ESX Server that is no longer connected. You can eliminate this message by ensuring that ESX Servers that are no longer managed by a Virtual Center are “removed” from the Virtual Center.



Table 7. Agent problems and solutions (continued)

Problem	Solution
The Tivoli Enterprise Portal suddenly shows ESX Servers as offline.	<p>The Monitoring Agent for VMware VI might query the VMware Virtual Center or VMware ESX Server for large amounts of data, depending on the size of the VMware environment. Keep the number of Monitoring Agent for VMware VI instances that is configured for the same VMware Virtual Center or VMware ESX Server data source to a minimum, preferably one. Keeping this number to a minimum keeps the VMware servers from running out of connection resources. In large VMware environments, it might be necessary to increase the number of ephemeral ports available to the VMware Virtual Center application, and decrease the TIMED_WAIT value for TCP connections.</p> <p>KB 1003679 describes this problem that occurs with the 2.0.2 Virtual Center and has been fixed in the 2.5 version.</p>
The Monitoring Agent for VMware VI cannot connect, or can no longer connect to an ESX Server data source.	The ESX Server hostd process might have gone down. If so, restart the hostd process using the <b>service vmware-mgmt restart</b> command. VMware SR 1102374551 describes this problem.
The IBM Systems Director workspace might not render IBM Systems Director web UI scrollbars correctly.	This problem occurs when a Systems Director dialog box is displayed in front of a base view and causes a dialog box (foreground) scroll bar to render on top of the base (background) scroll bar. In this scenario, the foreground scroll bar actions are passed to the background view. Moving the foreground dialog box so these scroll bars are no longer on top of each other resolves this situation. It might be necessary to resize the Tivoli Enterprise Portal window to ensure that the dialog box can be moved far enough.
The Monitoring Agent for VMware VI is not configured to connect to its data source using SSL. No ESX subnodes are discovered.	Check the RAS trace option settings, which are described in “Setting RAS trace parameters by using the GUI” on page 330. The trace options settings that you can set on the KBB_RAS1= and KDC_DEBUG= lines potentially generate large amounts of data. Setting the data provider log level to FINE, FINER, FINEST, or ALL can create this problem.
<p>When using the <b>itmcmd agent</b> commands to start or stop this monitoring agent, you receive the following error message:</p> <p>MKCIIN0201E Specified product is not configured.</p>	<p>Include the command option <b>-o</b> to specify the instance to start or stop. The instance name must match the name used for configuring the agent. For example:</p> <pre>./itmcmd agent -o Test1 start vm</pre> <p>For more information about using the itmcmd commands, see the <i>IBM Tivoli Monitoring Command Reference</i>.</p>



Table 7. Agent problems and solutions (continued)

Problem	Solution
A configured and running instance of the monitoring agent is not displayed in the Tivoli Enterprise Portal, but other instances of the monitoring agent on the same system are displayed in the portal.	<p>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.</p> <p>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 <b>netstat</b> command).</p> <p>A Tivoli process derives the physical port for IP.PIPE communications based on the configured, well-known port for the hub Tivoli Enterprise Monitoring Server. (This well-known port or BASE_PORT is configured by using the 'PORT:' keyword on the <b>KDC_FAMILIES / KDE_TRANSPORT</b> environment variable and defaults to '1918'.)</p> <p>The physical port allocation method is defined as <math>(BASE\_PORT + 4096 * N)</math>, where <math>N=0</math> for a Tivoli Enterprise Monitoring Server process and <math>N=\{1, 2, \dots, 15\}</math> for another type of monitoring server process. Two architectural limits result as a consequence of the physical port allocation method:</p> <ul style="list-style-type: none"> <li>• No more than one Tivoli Enterprise Monitoring Server reporting to a specific Tivoli Enterprise Monitoring Server hub can be active on a system image.</li> <li>• No more than 15 IP.PIPE processes can be active on a single system image.</li> </ul> <p>A single system image can support any number of Tivoli Enterprise Monitoring Server processes (address spaces) if each Tivoli Enterprise Monitoring Server on that image reports to a different hub. By definition, one Tivoli Enterprise Monitoring Server hub is available per monitoring enterprise, so this architecture limit has been reduced to one Tivoli Enterprise Monitoring Server per system image.</p> <p>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.</p> <p>Continued on next row.</p>

Table 7. 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 <b>KDC_FAMILIES / KDE_TRANSPORT</b> 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.)
I cannot find my queries.	Agents that include subnodes display their queries within the element in the Query Editor list that represents the location of the attribute group. The queries are most often found under the name of the subnode, not the name of the agent.
No data is available on the Tivoli Enterprise Portal.  The Java data provider stopped responding and you observe the following details: <ul style="list-style-type: none"> <li>The agent data provider log file, <code>kvm_data_provider_INSTANCE_NAME_0.log</code>, displays <code>java.lang.OutOfMemoryError</code> exceptions.</li> <li>The agent data provider startup log file, <code>kvm_data_provider_INSTANCE_NAME_startup.log</code>, displays the following error:  <pre>JVMDUMP006I Processing dump event "systhrow", detail "java/lang/OutOfMemoryError" - please wait. - Java data provider creates a file named javacore.date.time.number.txt in the CANDLEHOME\tmaitm6 directory, and this file contains the string java/lang/OutOfMemoryError</pre> </li> </ul>	To resolve this problem, complete the following steps: <ol style="list-style-type: none"> <li>1. Stop the agent instance, and check whether the data provider Java process is stopped.  <b>Important:</b> If the Java process that is running the data provider does not stop, end the Java process specific to the data provider.</li> <li>2. Increase the heap size for the Java data provider.  For more information about increasing the Java heap size, see "Increasing the Java heap size" on page 17.</li> <li>3. Restart agent instance.</li> </ol>

## Workspace troubleshooting

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

Table 8 on page 347 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.	<p>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:</p> <ol style="list-style-type: none"> <li>1. In the Windows <b>Start</b> menu, click <b>Run</b>.</li> <li>2. Type perfmon.exe in the <b>Open</b> field of the Run window. The Performance window is displayed.</li> <li>3. Click the plus sign (+) in the toolbar. The Add Counters window is displayed.</li> <li>4. Look for <b>Process</b> in the <b>Performance object</b> menu.</li> <li>5. Complete one of the following actions: <ul style="list-style-type: none"> <li>• If you see <b>Process</b> 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.</li> <li>• If you do not see <b>Process</b> in the menu, use the Microsoft utility from the Microsoft.com Operations website to enable the PerfProc performance object. The <b>Process</b> performance object becomes visible in the <b>Performance object</b> menu of the Add Counters windows, and IBM Tivoli Monitoring is able to detect Availability data.</li> </ul> </li> <li>6. Restart the monitoring agent.</li> </ol>
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.
At the end of each view, you see the following Historical workspace KFWITM220E error: Request failed during execution.	Ensure that you configure all groups that supply data to the view. In the Historical Configuration view, ensure that data collection is started for all groups that supply data to the view.

Table 8. Workspace problems and solutions (continued)

Problem	Solution
You start collection of historical data but the data cannot be seen.	<p>Use the following managing options for historical data collection:</p> <ul style="list-style-type: none"> <li>• 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 <i>Managing historical data</i> in the <i>IBM Tivoli Monitoring Administrator's Guide</i>. By setting a more frequent interval for data collection, you reduce the load on the system incurred every time data is uploaded.</li> <li>• 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 <i>Managing historical data</i> in the <i>IBM Tivoli Monitoring Administrator's Guide</i>.</li> </ul>
Historical data collection is unavailable because of incorrect queries in the Tivoli Enterprise Portal.	<p>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.</p> <p>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).</p> <p>To ensure support of historical data collection, do not use the Sort By, Group By, or First/Last functions in your queries.</p> <p>For information about the historical data collection function, See <i>Managing historical data</i> in the <i>IBM Tivoli Monitoring Administrator's Guide</i> or the Tivoli Enterprise Portal online help .</p>
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.
The VMware VI agent does not display aggregate metrics for CPU on SMP virtual machines.	<p>VMware Virtual Infrastructure does not provide detailed aggregate virtual machine CPU metrics.</p> <p>The OS agents provide aggregated CPU metrics for SMP systems. You can install the IBM Tivoli Monitoring OS agent on the virtual machine to get these metrics.</p>

Table 8. Workspace problems and solutions (continued)

Problem	Solution
The Virtual Center Events view in the Events Workspace does not return data.	If the VMware VI agent instance is configured with only ESX Server data sources, no data is returned in the Virtual Center Events view. Only VMware Events and Alarms related to a Virtual Center are displayed in this view. ESX Server Events and Alarms are displayed in the Events view in the ESX Server workspace.
The Virtual Machine Partitions View in the Disk workspace shows only one partition on a Linux Virtual machine.	The VMware VI agent appears to return only data for physical, non-removable devices for this property. The agent displays only the data returned from VMware. Install the IBM Tivoli Monitoring: Linux OS Agent on the Linux Virtual System for access to complete File System metrics.
The workspace for the VMware VI Agent Navigator node is undefined.	When multiple instances of the VMware VI agent are defined on a system, the top-level node becomes VMware VI Agent. The VMware VI Agent workspace is undefined at this node. A node for each instance is created called <i>Instance:Hostname:VM</i> . A workspace that is called <i>Instance:Hostname:VM</i> is associated with the instance node. This workspace is comparable to the VMware VI Agent workspace.
No ESX Server subnodes are displayed in the navigation tree.	See Table 7 on page 343.
The dynamic links that connect to the OS agent workspaces are disabled.	When the OS type cannot be determined for the virtual machine, VMware Tools might not be installed or running. Ensure that VMware Tools is installed on the virtual machine. On Linux systems, the VMware Tools do not start until at least the first login to the virtual machine, so ensure that you have logged in to the virtual machine.
Clicking a dynamic link returns the following message: KFWITM081E: The link target cannot be found. The link definition might be incorrect or the target is unavailable.	Ensure that the appropriate OS monitoring agent (on Windows or Linux systems) is installed on the targeted virtual machine. Next, verify that the OS monitoring agent is running and that it is configured to connect to the same Tivoli Enterprise Monitoring Server to which the VMware VI agent is connected. You can navigate to the OS monitoring agent for the virtual machines directly in the same Tivoli Enterprise Portal from which you access the VMware VI agent.

Table 8. Workspace problems and solutions (continued)

Problem	Solution
A delay occurs in seeing workspace data when the VMware VI agent is first started.	<p>When the VMware VI agent is first started, it collects information about the hierarchy and organization of the virtualized environments it monitors. This information includes which ESX servers, virtual machines, resource pools, data stores, and clusters are available and how they are related to one another. This information is referred to as the <i>data source inventory</i>. Depending on the size of the monitored environment, network bandwidth and the computational power of the agent system, and the VMware data source, this initial collection of the inventory can take anywhere from a few seconds to a few minutes. After initial collection is complete, a message displays in the data provider log stating how long initial inventory collection took, and attribute group data collection can proceed.</p> <p>Collecting inventory information when the agent is started significantly decreases the amount of time subsequent data collections take and also reduces the overall network utilization of the agent.</p>
A metric value on a workspace is suddenly unavailable.	At times, not all requested ESX server properties are returned by the Virtual Center. This issue has been limited to a particular ESX Server and is not a persistent condition.
When different versions of the VMware VI agent are configured to the same Tivoli Enterprise Monitoring Server, certain workspace links might not function as expected.	This problem is a limitation in VMware VI V6.1.2. All links function as expected for 6.2.1 versions of the agent.

Table 8. Workspace problems and solutions (continued)

Problem	Solution
Workspace links for the Linux OS agent running on ESX hosts return an error even though a Linux OS agent is installed and running on the ESX server and the Linux OS agent is listed as ONLINE in the Managed System list shown in the Tivoli Enterprise Portal client from which the VMware VI agent is visible. The following error is displayed: KFWITM081E The link target cannot be found. The link definition might be incorrect or the target is unavailable.	<p>If you have installed a version of the IBM Tivoli Monitoring: Linux OS agent before IBM Tivoli Monitoring V6.2.0, you might encounter truncated Managed System names. If so, you can either uninstall the earlier Linux OS agent and reinstall the 6.2.0 version, or use the following instructions to restore the expected Managed System name for the truncated Managed System name of the Linux OS agent.</p> <p>IBM Tivoli Monitoring might not be able to generate a unique name for monitoring components because of the truncation of names that the product automatically generates.</p> <p>IBM Tivoli Monitoring automatically creates a name for each monitoring component by concatenating the host name and product code separated by colons (<i>hostname:LZ</i>).</p> <p><b>Note:</b> When you monitor a multinode system, such as a database, IBM Tivoli Monitoring adds a subsystem name to the concatenated name, typically a database instance name.</p> <p>The length of the name that IBM Tivoli Monitoring generates is limited to 32 characters. Truncation can result in multiple components having the same 32-character name. If this problem happens, shorten the <i>hostname</i> portion of the name as follows:</p> <ol style="list-style-type: none"> <li>1. Open the configuration file for the monitoring agent, which is located in the following path: <i>install_dir/config/lz.ini</i>. <b>Note:</b> When you modify the <i>lz.ini</i> file, your configuration changes affect only the instance of the Monitoring Agent for Linux OS that is running on the computer. If you want your configuration changes to affect all agents that run on the computer, modify the <i>install_dir/config/env.config</i> file.</li> <li>2. Find the line the begins with CTIRA_HOSTNAME=.</li> <li>3. Type a new name for the host name that is a unique, shorter name for the host computer. The final concatenated name including the subsystem name, new host name, and LZ cannot be longer than 32 characters. <b>Note:</b> You must ensure that the resulting name is unique with respect to any existing monitoring component that was previously registered with the Tivoli Enterprise Monitoring Server.</li> <li>4. Save the file and restart the agent.</li> </ol> <p>If you cannot find the CTIRA_HOSTNAME environment variable, you must add it to the configuration file of the monitoring agent:</p> <ul style="list-style-type: none"> <li>• On Windows systems, use the <b>Advanced &gt; Edit Variables</b> option.</li> <li>• On UNIX and Linux systems, add the variable to the <i>config/product_code.ini</i> file.</li> </ul>

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 <i>Installing and enabling application support in the IBM Tivoli Monitoring Installation and Setup Guide</i> .
The VMware VI subnode navigator item does not show the All Orphaned Virtual Machine workspace when the agent support is updated from V7.1 or earlier.	To resolve this problem, restart the Tivoli Enterprise Portal Server to view the updated or new workspace on the VMware VI navigator item.

## Situation troubleshooting

Problems can occur with situations and situation configuration.

Table 9 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 330. For example, trace logs grow rapidly when you apply the ALL logging option.
Monitoring activity requires too many system resources.	“Disk capacity planning for historical data” on page 287 describes 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 <b>Free Memory</b> falls under 10 percent of <b>Total Memory</b> 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. <b>Note:</b> The Situation Editor provides alternatives to math operators. In the example, you can select the % <b>Memory Free</b> attribute and avoid the need for math operators.
You want to change the appearance of situations when they are displayed in the navigation tree.	<ol style="list-style-type: none"> <li>1. Right-click an item in the navigation tree.</li> <li>2. Click <b>Situations</b> in the menu. The Situation Editor window is displayed.</li> <li>3. Select the situation that you want to modify.</li> <li>4. Use the <b>State</b> menu to set the status and appearance of the Situation when it triggers. <b>Note:</b> The <b>State</b> setting is not related to severity settings in the Tivoli Enterprise Console.</li> </ol>
The VMware VI agent group in the Situation Editor is empty.	The VMware VI node in the Situation Editor contains all the default KVM situations because they use attributes from the attribute groups that are associated with the VMware VI subnodes. By default, the VMware VI agent node in the Situation Editor is empty because no default KVM situations use attributes from the attribute groups that are associated with the VMware VI agent subnodes.



Table 9. Situation problems and solutions (continued)

Problem	Solution
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 <i>KpcENV</i> file for the agent (where <i>pc</i> is the two-letter product code): <code>CDP_NT_EVENT_LOG_CACHE_TIMEOUT=3600</code>  This variable determines how long events from the NT Event Log are kept.
For a situation that uses the 'MISSING' operator and is distributed to a remote agentless monitoring subnode, no indication is displayed in the Tivoli Enterprise Portal or in the Situation Event Console when the situation becomes true.	The MISSING predicate is currently not supported on subnodes. If a situation with a MISSING predicate is distributed to a subnode, the agent cannot tell which subnode or node the event is occurring on. It inserts the system name as the origin node for the event and returns. When the event reaches the Tivoli Enterprise Portal Server, the origin node does not match the system name of the subnode where the situation is associated, so the event is dropped.
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 <i>IBM Tivoli Monitoring Installation and Setup Guide</i> .
The monitoring interval is too long.	Access the Situation Editor view for the situation that you want to modify. Check the <b>Sampling interval</b> area in the <b>Formula</b> 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 <b>Stop Situation</b> . 2. Right-click the situation and select <b>Start Situation</b> . <b>Note:</b> You can permanently avoid this problem by selecting the <b>Run at Startup</b> check box of the Situation Editor view for a specific situation.
The situation is not displayed.	Click the <b>Action</b> 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.
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 <b>Distribution</b> tab and check the distribution settings for the situation.

Table 9. Situation problems and solutions (continued)

Problem	Solution
The situation does not fire.	<p>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.</p> <p>In the <b>Formula</b> tab, analyze predicates as follows:</p> <ol style="list-style-type: none"> <li>1. Click the <b>fx</b> icon in the <b>Formula</b> area. The Show formula window is displayed. <ol style="list-style-type: none"> <li>a. Confirm the following details in the <b>Formula</b> area of the window: <ul style="list-style-type: none"> <li>• The attributes that you intend to monitor are specified in the formula.</li> <li>• The situations that you intend to monitor are specified in the formula.</li> <li>• The logical operators in the formula match your monitoring goal.</li> <li>• The numeric values in the formula match your monitoring goal.</li> </ul> </li> <li>b. (Optional) Select the <b>Show detailed formula</b> check box to see the original names of attributes in the application or operating system that you are monitoring.</li> <li>c. Click <b>OK</b> to dismiss the Show formula window.</li> </ol> </li> <li>2. (Optional) In the <b>Formula</b> area of the <b>Formula</b> 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. <p><b>Note:</b> 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.</p> </li> </ol> <p>For additional information about situations that do not fire, see <i>Situations are not firing</i> in the <i>IBM Tivoli Monitoring Troubleshooting Guide</i>.</p>
Situation events are not displayed in the Events Console view of the workspace.	<p>Associate the situation with a Navigator item.</p> <p><b>Note:</b> The situation does not need to be displayed in the workspace. It is sufficient that the situation is associated with any Navigator item.</p>
You do not have access to a situation.	<p><b>Note:</b> You must have administrator privileges to complete these steps.</p> <ol style="list-style-type: none"> <li>1. Click <b>Edit &gt; Administer Users</b> to access the Administer Users window.</li> <li>2. In the <b>Users</b> area, select the user whose privileges you want to modify.</li> <li>3. In the <b>Permissions</b> tab, <b>Applications</b> tab, and <b>Navigator Views</b> tab, select the permissions or privileges that correspond to the user role.</li> <li>4. Click <b>OK</b>.</li> </ol>

Table 9. Situation problems and solutions (continued)

Problem	Solution
A managed system seems to be offline.	<ol style="list-style-type: none"> <li>1. Select <b>Physical View</b> and click the Enterprise Level of the navigator tree.</li> <li>2. Click <b>View &gt; Workspace &gt; Managed System Status</b> to see a list of managed systems and their status.</li> <li>3. If a system is offline, check network connectivity and the status of the specific system or application.</li> </ol>
When the KVM_Server_VMotion_Event situation is triggered and you click the link for the situation to view the situation details, the situation does not open in the Tivoli Enterprise Portal.	Upgrade IBM Tivoli Monitoring to IBM Tivoli Monitoring V6.3.

## Take Action commands troubleshooting

Problems can occur with Take Action commands.

Table 10 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 3 on page 325.

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 352. If the Take Action command fails, for general information about troubleshooting Take Action commands, see the <i>IBM Tivoli Monitoring Troubleshooting Guide</i> .

## Discovery Library Adapter for the agent troubleshooting

Problems can occur when using the Discovery Library Adapter for the VMware VI agent.

Table 11 contains problems and solutions that can occur when using the Discovery Library Adapter for IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI. For additional information about troubleshooting for the Discovery Library Adapter, see the IBM Tivoli Application Dependency Discovery Manager Information Center ([http://publib.boulder.ibm.com/infocenter/tivihelp/v10r1/topic/com.ibm.taddm.doc\\_7.2/welcome\\_page/welcome.html](http://publib.boulder.ibm.com/infocenter/tivihelp/v10r1/topic/com.ibm.taddm.doc_7.2/welcome_page/welcome.html)).

Table 11. Discovery Library Adapter for VMware VI agent problems and solutions

Problem	Solution
Importing DLA into a clear (no data) IBM Tivoli Application Dependency Discovery Manager (TADDMM) server does not create the relationship and associations between the Virtual Center and the ESX servers. The Application Infrastructure Topology does not show the ESX Servers.	DLAs do not create the logical relationships required to populate the Application Infrastructure Topology. To create logical relationships, run the appropriate sensor to discover or create them in TADDMM.

Table 11. Discovery Library Adapter for VMware VI agent problems and solutions (continued)

Problem	Solution
When running the <b>loadidlml</b> command to load the DLA book into TADDM when the DLA book is generated for a VMware agent running on Windows 2000, the command fails with a parsing error.	If you are monitoring Windows 2000 systems with non-OS agents that have DLA templates, you cannot use the IBM Tivoli Monitoring DLA.
When running the <b>loadidlml</b> command to load the DLA book into TADDM when the DLA book is generated for a VMware agent running on a system other than Windows 2000, the command fails with a parsing error.	You must have an OS agent installed and running on the same system on which the VMware agent is installed.
After loading the IDML book for the VMware VI agent into Tivoli Business Service Manager, the VMware entities are not automatically displayed in the Tivoli Business Service Manager console.	<p>CDM classes for the VMware VI agent are currently not available in Tivoli Business Service Manager V4.2.1 Fix Pack 1. As a result, after loading the IDML book for the VMware VI agent into Tivoli Business Service Manager, the VMware entities are not automatically displayed in the Tivoli Business Service Manager console, but require that you add VMware VI agent classes to Tivoli Business Service Manager manually as follows:</p> <ol style="list-style-type: none"> <li>1. Open the Tivoli Business Service Manager console, click <b>Administration &gt; Service Configuration</b>, and select the Service Component Repository from the drop-down list in the right panel.</li> <li>2. In the Service Navigation panel, click <b>Component Registry &gt; Servers &gt; Clusters</b>.</li> <li>3. Click <b>Clusters</b>.</li> <li>4. In the Service Editor panel, click the <b>Additional</b> tab and edit the <b>classnamefilter</b> text box to add comma-separated fields for the VMware classes you want to add. The string might look something like the following:  <pre>'cdm:sys.ComputerSystem', 'cdm:sys.vmware.VmwareUnitaryComputerSystem', 'cdm:sys.vmware.VMwareESX', 'cdm:sys.vmware.VirtualCenter', 'cdm:sys.vmware.DataCenter', 'cdm:sys.vmware.DataStore'</pre> </li> <li>5. Click <b>Save</b> to save the setting changes. The VMware entities (such as clusters, virtual centers, and virtual machines) are displayed in the Tivoli Business Service Manager console.</li> </ol>

## 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 Wiki (<http://www.ibm.com/developerworks/servicemanagement/apm/index.html>). Feel free to contribute to this wiki.

### 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>).

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## Informational, warning, and error messages overview

Messages relay information about how the system or application is performing and can alert you to exceptional conditions when they occur.

Messages are sent to an output destination, such as a file, database, or console screen.

If you receive a warning or error message, you can do one of the following actions:

- Follow the instructions listed in the Detail window of the message if this information is included there.
- Consult the message details listed in this topic to see what action you can take to correct the problem.
- Consult the message log for message ID, text, time, and date of the message, as well as other data you can use to diagnose the problem.

## Message format

The message format contains a message ID and text, an explanation, and an operator response.

IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI messages have the following format:

Message ID and text  
Explanation  
Operator Response

The message ID has the following format:

`CCC####severity`

where:

**CCC** Prefix that indicates the component to which the message applies. The following components are used:

**KVM** General VMware VI agent messages

**####** Number of the message

*severity*

Severity of the message. Three levels of severity are used:

- |          |   |
|----------|---|
| <b>I</b> | Informational messages provide feedback about something that happened in the product or system that might be important. These messages can provide guidance when you are requesting a specific action from the product. |
| <b>W</b> | Warning messages call your attention to an exception condition. The condition might not be an error but can cause problems if not resolved.   |
| <b>E</b> | Error messages indicate that an action cannot be completed because of a user or system error. These messages require user response.   |

The *Text* of the message provides a general statement regarding the problem or condition that occurred. The *Explanation* provides additional information about the message and the possible cause for the condition. The *Operator Response* provides actions to take in response to the condition, particularly for error messages (messages with the "E" suffix).

**Note:** Many message texts and explanations contain variables, such as the specific name of a server or application. Those variables are represented in this topic as symbols, such as "&1." Actual messages contain values for these variables.

## Agent messages

The following messages apply to IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI.

### KVM5001I

The request to power on the virtual machine was sent successfully.

**Explanation:**

The virtual machine was successfully powered on, or it is in the process of powering on.

**Operator response:**

None.

### KVM5002I

The virtual machine is already powered on.

**Explanation:**

The virtual machine is already powered on.

**Operator response:**

None.

### KVM5003E

Could not perform the requested power on action.

**Explanation:**

The task could not be performed as requested.

**Operator response:**

Check whether one or both of these connections exist: the Virtual Center has a connection to the ESX Server, or there is a network connection between the monitoring agent and the Virtual Center or ESX Server.

### KVM5004I

The request to power off the virtual machine was sent successfully.

**Explanation:**

The virtual machine was successfully powered off, or it is in the process of powering off.

**Operator response:**

None.

### KVM5005I

The virtual machine is powered off.

**Explanation:**

The virtual machine is powered off.

**Operator response:**

None.

### KVM5006E

Could not perform the requested power off action.

**Explanation:**

The task could not be performed as requested.

**Operator response:**

Check whether one or both of these connections exist: the Virtual Center has a connection to the ESX Server, or there is a connection between the agent and the Virtual Center or ESX Server.

**KVM5007E**

The ESX server name specified is invalid or could not be found.

**Explanation:**

The task could not be performed as requested.

**Operator response:**

Check the name of the ESX server and ensure that it is specified correctly when executing this action.

**KVM5008E**

One of the required parameters for this action was not specified.

**Explanation:**

The task could not be performed as requested.

**Operator response:**

Check that both the ESX server name and the name of the virtual machine were specified.

**KVM5009E**

An unknown action was specified for this request.

**Explanation:**

The task could not be performed as requested.

**Operator response:**

Check that the action was specified correctly.

**KVM5040E**

Data source not found in the environment.

**Explanation:**

At least one data source must be defined or configured.

**Operator response:**

Check the configuration of the agent and restart.

**KVM5041E**

Unable to log in to data source.

**Explanation:**

The user ID or password supplied were not authenticated by the data source.

**Operator response:**

Check the user ID and password in the agent configuration and restart.

**KVM5042E**

The data source host could not be found on the network or a connection could not be made.

**Explanation:**

A connection could not be made to a data source configured for data collection.

**Operator response:**

Check the host name of the data sources configured for the agent. Ensure that a good network connection exists.

**KVM5043E**

Monitored server unavailable.

**Explanation:**

A data collection request was issued for a server that is no longer available.

**Operator response:**

This condition is typically temporary and clears itself. If it does not clear, contact your support representative.

**KVM5044E**

Data provider is recovering from a communications error.

**Explanation:**

A communications error occurred with a data source. The agent is resetting.

**Operator response:**

None.

**KVM5045E**

The specified virtual machine was not found.

**Explanation:**

The task could not be performed as requested.

**Operator response:**

Check that the name of the virtual machine was specified correctly.



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## Appendix A. Event mapping

The Tivoli Event Integration Facility (EIF) interface is used to forward situation events to Tivoli Netcool/OMNIBus or Tivoli Enterprise Console.

EIF events specify an event class, and the event data is specified as name-value pairs that identify the name of an event slot and the value for the slot. An event class can have subclasses. IBM Tivoli Monitoring provides the base event class definitions and a set of base slots that are included in all monitoring events. Agents extend the base event classes to define subclasses that include agent-specific slots. For VMware VI agent events, the event classes correspond to the agent attribute groups, and the agent-specific slots correspond to the attributes in the attribute group.

The situation editor in the Tivoli Enterprise Portal can be used to perform custom mapping of data to EIF slots instead of using the default mapping described in this topic. For more information about EIF slot customization, see the *Tivoli Enterprise Portal User's Guide*.

Tivoli Enterprise Console requires that event classes and their slots are defined in BAROC (Basic Recorder of Objects in C) files. Each agent provides a BAROC file that contains event class definitions for the agent and is installed on the Tivoli Enterprise Monitoring Server in the TECLIB directory (`install_dir/cms/TECLIB` for Windows systems and `install_dir/tables/TEMS_hostname/TECLIB` for UNIX systems) when application support for the agent is installed. The BAROC file for the agent and the base BAROC files provided with Tivoli Monitoring must also be installed onto the Tivoli Enterprise Console. For details, see "Setting up event forwarding to Tivoli Enterprise Console" in the *IBM Tivoli Monitoring Installation and Setup Guide*.

Each of the event classes is a child of KVM\_Base and is defined in the `kvm.baroc` (version 7.2 Fix Pack 2) file. The KVM\_Base event class can be used for generic rules processing for any event from the IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI.

For events that are generated by situations in the Active Tasks attribute group, events are sent by using the ITM\_KVM\_ACTIVE\_TASKS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- source\_hostname: STRING
- source\_hostname\_enum: STRING
- name: STRING
- name\_enum: STRING
- target\_entity: STRING
- target\_entity\_enum: STRING
- kvm\_status: STRING
- kvm\_status\_enum: STRING
- initiated\_by: STRING
- initiated\_by\_enum: STRING
- cancelable: INTEGER
- cancelable\_enum: STRING
- queue\_time: STRING
- queue\_time\_enum: STRING
- start\_time: STRING

- start\_time\_enum: STRING
- target\_entity\_type: STRING
- target\_entity\_type\_enum: STRING

For events that are generated by situations in the Agent Events attribute group, events are sent by using the ITM\_KVM\_AGENT\_EVENTS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- kvm\_source: STRING
- managed\_system: STRING
- subsystem: INTEGER
- subsystem\_enum: STRING
- kvm\_severity: INTEGER
- kvm\_severity\_enum: STRING
- message: INTEGER
- message\_enum: STRING

For events that are generated by situations in the Cluster DRS Faults attribute group, events are sent by using the ITM\_KVM\_CLUSTER\_DRS\_FAULTS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- kvm\_source: STRING
- kvm\_source\_enum: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- cluster: STRING
- cluster\_enum: STRING
- fault\_name: STRING
- fault\_name\_enum: STRING
- reason: STRING
- reason\_enum: STRING
- fault\_message: STRING
- fault\_message\_enum: STRING
- source\_hostname: STRING
- source\_hostname\_enum: STRING
- target\_hostname: STRING
- target\_hostname\_enum: STRING
- virtual\_machine: STRING
- virtual\_machine\_enum: STRING
- ft\_virtual\_machine: STRING
- ft\_virtual\_machine\_enum: STRING
- drs\_type: STRING
- drs\_type\_enum: STRING

For events that are generated by situations in the Clustered Datastores attribute group, events are sent by using the ITM\_KVM\_CLUSTERED\_DATASTORES event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- cluster: STRING
- cluster\_enum: STRING
- datastore: STRING
- datastore\_enum: STRING
- overall\_status: STRING
- overall\_status\_enum: STRING
- accessible: INTEGER
- accessible\_enum: STRING
- capacity: INTEGER
- capacity\_enum: STRING
- percent\_used: INTEGER
- percent\_used\_enum: STRING
- type: STRING
- type\_enum: STRING
- remote\_host\_address: STRING
- remote\_host\_address\_enum: STRING
- remote\_path: STRING
- remote\_path\_enum: STRING
- msn: STRING
- msn\_enum: STRING
- nodeid: STRING
- connected\_hosts: INTEGER
- connected\_hosts\_enum: STRING
- connected\_vms: INTEGER
- connected\_vms\_enum: STRING

For events that are generated by situations in the Clustered Resource Pools attribute group, events are sent by using the ITM\_KVM\_CLUSTERED\_RESOURCE\_POOLS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- cluster\_name: STRING
- cluster\_name\_enum: STRING
- pool\_name: STRING
- pool\_name\_enum: STRING
- max\_cpu\_usage: INTEGER
- max\_cpu\_usage\_enum: STRING
- cpu\_usage: INTEGER
- cpu\_usage\_enum: STRING
- max\_memory\_usage: INTEGER

- max\_memory\_usage\_enum: STRING
- memory\_usage: INTEGER
- memory\_usage\_enum: STRING
- percent\_cpu\_usage: INTEGER
- percent\_cpu\_usage\_enum: STRING
- percent\_memory\_usage: INTEGER
- percent\_memory\_usage\_enum: STRING
- overall\_status: STRING
- overall\_status\_enum: STRING
- nodeid: STRING
- nodetype: STRING

For events that are generated by situations in the Clustered Servers attribute group, events are sent by using the ITM\_KVM\_CLUSTERED\_SERVERS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- cluster\_name: STRING
- cluster\_name\_enum: STRING
- server\_hostname: STRING
- server\_hostname\_enum: STRING
- server\_cpu\_utilization: INTEGER
- server\_cpu\_utilization\_enum: STRING
- server\_memory\_utilization: INTEGER
- server\_memory\_utilization\_enum: STRING
- cpu\_effective\_contribution: INTEGER
- cpu\_effective\_contribution\_enum: STRING
- cpu\_total\_contribution: INTEGER
- cpu\_total\_contribution\_enum: STRING
- cpu\_effective\_utilization: INTEGER
- cpu\_effective\_utilization\_enum: STRING
- cpu\_total\_utilization: INTEGER
- cpu\_total\_utilization\_enum: STRING
- mem\_effective\_contribution: INTEGER
- mem\_effective\_contribution\_enum: STRING
- mem\_total\_contribution: INTEGER
- mem\_total\_contribution\_enum: STRING
- memory\_effective\_utilization: INTEGER
- memory\_effective\_utilization\_enum: STRING
- memory\_total\_utilization: INTEGER
- memory\_total\_utilization\_enum: STRING
- msn\_name: STRING
- msn\_name\_enum: STRING
- overall\_status: STRING

- overall\_status\_enum: STRING
- nodeid: STRING

For events that are generated by situations in the Clustered Virtual Apps attribute group, events are sent by using the ITM\_KVM\_CLUSTERED\_VIRTUAL\_APPS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- cluster\_name: STRING
- cluster\_name\_enum: STRING
- virtual\_app\_name: STRING
- virtual\_app\_name\_enum: STRING
- virtual\_machine\_name: STRING
- virtual\_machine\_name\_enum: STRING
- destroy\_with\_parent: INTEGER
- destroy\_with\_parent\_enum: STRING
- waiting\_for\_guest: INTEGER
- waiting\_for\_guest\_enum: STRING
- start\_action: STRING
- start\_action\_enum: STRING
- stop\_action: STRING
- stop\_action\_enum: STRING
- start\_delay: INTEGER
- start\_delay\_enum: STRING
- stop\_delay: INTEGER
- stop\_delay\_enum: STRING
- start\_order: INTEGER
- start\_order\_enum: STRING
- moref: STRING
- moref\_enum: STRING
- nodeid: STRING

For events that are generated by situations in the Clustered Virtual Machines attribute group, events are sent by using the ITM\_KVM\_CLUSTERED\_VIRTUAL\_MACHINES event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- cluster\_name: STRING
- cluster\_name\_enum: STRING
- vm\_name: STRING
- vm\_name\_enum: STRING
- cpu\_utilization: INTEGER

- cpu\_utilization\_enum: STRING
- memory\_utilization: INTEGER
- memory\_utilization\_enum: STRING
- msn\_name: STRING
- msn\_name\_enum: STRING
- overall\_status: STRING
- overall\_status\_enum: STRING
- nodeid: STRING

For events that are generated by situations in the Clusters attribute group, events are sent by using the ITM\_KVM\_CLUSTERS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- cluster\_name: STRING
- cluster\_name\_enum: STRING
- drs\_enabled: INTEGER
- drs\_enabled\_enum: STRING
- ha\_enabled: INTEGER
- ha\_enabled\_enum: STRING
- number\_servers: INTEGER
- number\_servers\_enum: STRING
- effective\_servers: INTEGER
- effective\_servers\_enum: STRING
- number\_cpus: INTEGER
- number\_cpus\_enum: STRING
- total\_memory: REAL
- total\_memory\_enum: STRING
- effective\_memory: REAL
- effective\_memory\_enum: STRING
- total\_cpu: REAL
- total\_cpu\_enum: STRING
- effective\_cpu: REAL
- effective\_cpu\_enum: STRING
- number\_vmotions: INTEGER
- number\_vmotions\_enum: STRING
- overall\_status: STRING
- overall\_status\_enum: STRING
- cpu\_utilization: REAL
- cpu\_utilization\_enum: STRING
- memory\_utilization: REAL
- memory\_utilization\_enum: STRING
- cpu\_00\_10: INTEGER
- cpu\_00\_10\_enum: STRING

- cpu\_10\_20: INTEGER
- cpu\_10\_20\_enum: STRING
- cpu\_20\_30: INTEGER
- cpu\_20\_30\_enum: STRING
- cpu\_30\_40: INTEGER
- cpu\_30\_40\_enum: STRING
- cpu\_40\_50: INTEGER
- cpu\_40\_50\_enum: STRING
- cpu\_50\_60: INTEGER
- cpu\_50\_60\_enum: STRING
- cpu\_60\_70: INTEGER
- cpu\_60\_70\_enum: STRING
- cpu\_70\_80: INTEGER
- cpu\_70\_80\_enum: STRING
- cpu\_80\_90: INTEGER
- cpu\_80\_90\_enum: STRING
- cpu\_90\_100: INTEGER
- cpu\_90\_100\_enum: STRING
- memory\_00\_10: INTEGER
- memory\_00\_10\_enum: STRING
- memory\_10\_20: INTEGER
- memory\_10\_20\_enum: STRING
- memory\_20\_30: INTEGER
- memory\_20\_30\_enum: STRING
- memory\_30\_40: INTEGER
- memory\_30\_40\_enum: STRING
- memory\_40\_50: INTEGER
- memory\_40\_50\_enum: STRING
- memory\_50\_60: INTEGER
- memory\_50\_60\_enum: STRING
- memory\_60\_70: INTEGER
- memory\_60\_70\_enum: STRING
- memory\_70\_80: INTEGER
- memory\_70\_80\_enum: STRING
- memory\_80\_90: INTEGER
- memory\_80\_90\_enum: STRING
- memory\_90\_100: INTEGER
- memory\_90\_100\_enum: STRING
- percent\_effective\_servers: INTEGER
- percent\_effective\_servers\_enum: STRING
- percent\_effective\_cpu: INTEGER
- percent\_effective\_cpu\_enum: STRING
- percent\_effective\_memory: INTEGER
- percent\_effective\_memory\_enum: STRING
- number\_vms: INTEGER

- number\_vms\_enum: STRING
- number\_vms\_on: INTEGER
- number\_vms\_on\_enum: STRING
- datacenter\_moref: STRING
- datacenter\_moref\_enum: STRING
- cluster\_moref: STRING
- cluster\_moref\_enum: STRING
- datastores\_total\_space: INTEGER
- datastores\_total\_space\_enum: STRING
- datastores\_total\_free\_space: INTEGER
- datastores\_total\_free\_space\_enum: STRING
- nodeid: STRING
- servers\_in\_maintenance\_mode: INTEGER
- servers\_in\_maintenance\_mode\_enum: STRING
- total\_vm\_configured\_memory: REAL
- total\_vm\_configured\_memory\_enum: STRING
- total\_vm\_provisioned\_space: REAL
- total\_vm\_provisioned\_space\_enum: STRING
- physical\_nics: INTEGER
- physical\_nics\_enum: STRING
- physical\_nics\_down: INTEGER
- physical\_nics\_down\_enum: STRING

For events that are generated by situations in the Datacenters attribute group, events are sent by using the ITM\_KVM\_DATACENTERS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- total\_servers: INTEGER
- total\_servers\_enum: STRING
- effective\_servers: INTEGER
- effective\_servers\_enum: STRING
- percent\_effective\_servers: REAL
- percent\_effective\_servers\_enum: STRING
- total\_memory: INTEGER
- total\_memory\_enum: STRING
- effective\_memory: INTEGER
- effective\_memory\_enum: STRING
- memory\_utilization: REAL
- memory\_utilization\_enum: STRING
- total\_cpu: INTEGER
- total\_cpu\_enum: STRING
- effective\_cpu: INTEGER
- effective\_cpu\_enum: STRING
- cpu\_utilization: REAL



- cpu\_utilization\_enum: STRING
- overall\_status: STRING
- overall\_status\_enum: STRING
- nodeid: STRING

For events that are generated by situations in the Datastore Cluster attribute group, events are sent by using the ITM\_KVM\_DATASTORE\_CLUSTER event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- datastore\_cluster: STRING
- datastore\_cluster\_enum: STRING
- config\_status: STRING
- config\_status\_enum: STRING
- overall\_status: STRING
- overall\_status\_enum: STRING
- default\_intravm\_affinity: INTEGER
- default\_intravm\_affinity\_enum: STRING
- io\_load\_balance\_enabled: INTEGER
- io\_load\_balance\_enabled\_enum: STRING
- load\_balance\_interval: INTEGER
- load\_balance\_interval\_enum: STRING
- datastore\_count: INTEGER
- datastore\_count\_enum: STRING

For events that are generated by situations in the Datastore Host Disks attribute group, events are sent by using the ITM\_KVM\_DATASTORE\_HOST\_DISKS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- host: STRING
- host\_enum: STRING
- datastore: STRING
- datastore\_enum: STRING
- disk: STRING
- disk\_enum: STRING
- nodeid: STRING

For events that are generated by situations in the Datastore Topology attribute group, events are sent by using the ITM\_KVM\_DATASTORE\_TOPOLOGY event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- nodename: STRING
- nodeid: STRING

- nodetype: STRING
- nodestatus: STRING
- connecttonode: STRING
- connectiontype: STRING
- msn: STRING
- msn\_enum: STRING
- datacenter: STRING
- datacenter\_enum: STRING

For events that are generated by situations in the Datastores attribute group, events are sent by using the ITM\_KVM\_DATASTORES event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- name: STRING
- name\_enum: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- type: STRING
- type\_enum: STRING
- overall\_status: STRING
- overall\_status\_enum: STRING
- accessible: INTEGER
- accessible\_enum: STRING
- remote\_host\_address: STRING
- remote\_host\_address\_enum: STRING
- remote\_path: STRING
- remote\_path\_enum: STRING
- url: STRING
- url\_enum: STRING
- capacity: INTEGER
- capacity\_enum: STRING
- used\_space: INTEGER
- used\_space\_enum: STRING
- free\_space: INTEGER
- free\_space\_enum: STRING
- percent\_used: INTEGER
- percent\_used\_enum: STRING
- percent\_free: INTEGER
- percent\_free\_enum: STRING
- maximum\_file\_size: INTEGER
- maximum\_file\_size\_enum: STRING
- connected\_hosts: INTEGER
- connected\_hosts\_enum: STRING
- connected\_vms: INTEGER
- connected\_vms\_enum: STRING

- connected\_clusters: INTEGER
- connected\_clusters\_enum: STRING
- msn: STRING
- msn\_enum: STRING
- total\_read\_kbps: INTEGER
- total\_read\_kbps\_enum: STRING
- total\_write\_kbps: INTEGER
- total\_write\_kbps\_enum: STRING
- total\_io\_kbps: INTEGER
- total\_io\_kbps\_enum: STRING
- datastore\_moref: STRING
- datastore\_moref\_enum: STRING
- netapp\_volume\_name: STRING
- netapp\_volume\_name\_enum: STRING
- overcommitted: INTEGER
- overcommitted\_enum: STRING
- percent\_overcommitted: REAL
- percent\_overcommitted\_enum: STRING
- nodeid: STRING
- snapshot\_storage\_consumed: REAL
- snapshot\_storage\_consumed\_enum: STRING
- percent\_snapshot\_storage\_consumed: REAL
- percent\_snapshot\_storage\_consumed\_enum: STRING
- datastore\_cluster: STRING
- datastore\_cluster\_enum: STRING

For events that are generated by situations in the Director attribute group, events are sent by using the ITM\_KVM\_DIRECTOR event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- directorserver: STRING
- directorport: STRING
- usetepcredential: STRING

For events that are generated by situations in the Distributed Virtual Portgroups attribute group, events are sent by using the ITM\_KVM\_DISTRIBUTED\_VIRTUAL\_PORTGROUPS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- switch\_name: STRING
- switch\_name\_enum: STRING
- portgroup\_name: STRING
- portgroup\_name\_enum: STRING
- overall\_status: STRING

- overall\_status\_enum: STRING
- type: STRING
- type\_enum: STRING
- blocked: STRING
- blocked\_enum: STRING
- inbound\_shaping\_enabled: STRING
- inbound\_shaping\_enabled\_enum: STRING
- inbound\_shaping\_average\_bandwidth: INTEGER
- inbound\_shaping\_average\_bandwidth\_enum: STRING
- inbound\_shaping\_burst\_size: INTEGER
- inbound\_shaping\_burst\_size\_enum: STRING
- inbound\_shaping\_peak\_bandwidth: INTEGER
- inbound\_shaping\_peak\_bandwidth\_enum: STRING
- outbound\_shaping\_enabled: STRING
- outbound\_shaping\_enabled\_enum: STRING
- outbound\_shaping\_average\_bandwidth: INTEGER
- outbound\_shaping\_average\_bandwidth\_enum: STRING
- outbound\_shaping\_burst\_size: INTEGER
- outbound\_shaping\_burst\_size\_enum: STRING
- outbound\_shaping\_peak\_bandwidth: INTEGER
- outbound\_shaping\_peak\_bandwidth\_enum: STRING
- vlan\_type: STRING
- vlan\_type\_enum: STRING
- vlan\_id: INTEGER
- vlan\_id\_enum: STRING

For events that are generated by situations in the Distributed Virtual Switches attribute group, events are sent by using the ITM\_KVM\_DISTRIBUTED\_VIRTUAL\_SWITCHES event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- switch\_name: STRING
- switch\_name\_enum: STRING
- overall\_status: STRING
- overall\_status\_enum: STRING
- number\_of\_portgroups: INTEGER
- number\_of\_portgroups\_enum: STRING
- number\_of\_uplinks: INTEGER
- number\_of\_uplinks\_enum: STRING
- number\_of\_hosts: INTEGER
- number\_of\_hosts\_enum: STRING
- number\_of\_vms: INTEGER
- number\_of\_vms\_enum: STRING
- number\_of\_ports: INTEGER

- number\_of\_ports\_enum: STRING
- max\_number\_of\_ports: INTEGER
- max\_number\_of\_ports\_enum: STRING
- transmitted: INTEGER
- transmitted\_enum: STRING
- received: INTEGER
- received\_enum: STRING
- usage: INTEGER
- usage\_enum: STRING

For events that are generated by situations in the Distributed Virtual Uplinks attribute group, events are sent by using the ITM\_KVM\_DISTRIBUTED\_VIRTUAL\_UPLINKS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- switch\_name: STRING
- switch\_name\_enum: STRING
- portgroup\_name: STRING
- portgroup\_name\_enum: STRING
- uplink\_name: STRING
- uplink\_name\_enum: STRING
- overall\_status: STRING
- overall\_status\_enum: STRING
- component\_state: STRING
- component\_state\_enum: STRING
- host\_system: STRING
- host\_system\_enum: STRING
- nic: STRING
- nic\_enum: STRING
- transmitted: INTEGER
- transmitted\_enum: STRING
- received: INTEGER
- received\_enum: STRING
- usage: INTEGER
- usage\_enum: STRING
- link\_status: STRING
- link\_status\_enum: STRING
- link\_speed: INTEGER
- link\_speed\_enum: STRING
- duplex: STRING
- duplex\_enum: STRING
- subnode\_msn: STRING
- subnode\_msn\_enum: STRING
- link\_utilization: REAL

- link\_utilization\_enum: STRING

For events that are generated by situations in the ESX Performance Object Status attribute group, events are sent by using the ITM\_KVM\_ESX\_PERFORMANCE\_OBJECT\_STATUS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- query\_name: STRING
- object\_name: STRING
- object\_type: INTEGER
- object\_type\_enum: STRING
- object\_status: INTEGER
- object\_status\_enum: STRING
- error\_code: INTEGER
- error\_code\_enum: STRING
- last\_collection\_start: STRING
- last\_collection\_start\_enum: STRING
- last\_collection\_finished: STRING
- last\_collection\_finished\_enum: STRING
- last\_collection\_duration: REAL
- average\_collection\_duration: REAL
- average\_collection\_duration\_enum: STRING
- refresh\_interval: INTEGER
- number\_of\_collections: INTEGER
- cache\_hits: INTEGER
- cache\_misses: INTEGER
- cache\_hit\_percent: REAL
- intervals\_skipped: INTEGER

For events that are generated by situations in the Events attribute group, events are sent by using the ITM\_KVM\_EVENTS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- source\_hostname: STRING
- source\_hostname\_enum: STRING
- event\_seq\_number: INTEGER
- event\_seq\_number\_enum: STRING
- userid: STRING
- userid\_enum: STRING
- event\_time: STRING
- event\_time\_enum: STRING
- event: STRING
- event\_enum: STRING
- compute\_resource: STRING
- compute\_resource\_enum: STRING
- datacenter: STRING

- datacenter\_enum: STRING
- virtual\_machine: STRING
- virtual\_machine\_enum: STRING
- virtual\_machine\_uuid: STRING
- virtual\_machine\_uuid\_enum: STRING
- category: STRING
- category\_enum: STRING
- event\_type: STRING
- event\_type\_enum: STRING
- event\_text: STRING
- event\_text\_enum: STRING
- event\_type\_id: STRING
- event\_type\_id\_enum: STRING
- entity\_type: STRING
- entity\_type\_enum: STRING
- datastore: STRING
- datastore\_enum: STRING
- datastore\_uuid: STRING
- datastore\_uuid\_enum: STRING

For events that are generated by situations in the Monitored Servers attribute group, events are sent by using the ITM\_KVM\_MONITORED\_SERVERS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- subnode\_msn: STRING
- subnode\_affinity: STRING
- subnode\_type: STRING
- subnode\_resource\_name: STRING
- subnode\_version: STRING

For events that are generated by situations in the Networked Servers attribute group, events are sent by using the ITM\_KVM\_NETWORKED\_SERVERS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- network: STRING
- network\_enum: STRING
- switch: STRING
- switch\_enum: STRING
- server\_hostname: STRING
- server\_hostname\_enum: STRING
- transmitted: INTEGER
- transmitted\_enum: STRING
- received: INTEGER
- received\_enum: STRING

- usage: INTEGER
- usage\_enum: STRING
- subnode\_msn: STRING
- subnode\_msn\_enum: STRING

For events that are generated by situations in the Networked Virtual Machines attribute group, events are sent by using the ITM\_KVM\_NETWORKED\_VIRTUAL\_MACHINES event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- network: STRING
- network\_enum: STRING
- switch: STRING
- switch\_enum: STRING
- server\_hostname: STRING
- server\_hostname\_enum: STRING
- virtual\_machine: STRING
- virtual\_machine\_enum: STRING
- vm\_nic: STRING
- vm\_nic\_enum: STRING
- transmitted: INTEGER
- transmitted\_enum: STRING
- received: INTEGER
- received\_enum: STRING
- usage: INTEGER
- usage\_enum: STRING
- subnode\_msn: STRING
- subnode\_msn\_enum: STRING

For events that are generated by situations in the Networked Virtual Switches attribute group, events are sent by using the ITM\_KVM\_NETWORKED\_VIRTUAL\_SWITCHES event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- server\_hostname: STRING
- server\_hostname\_enum: STRING
- switch: STRING
- switch\_enum: STRING
- network: STRING
- network\_enum: STRING
- number\_of\_nics: INTEGER
- number\_of\_nics\_enum: STRING



- transmitted: INTEGER
- transmitted\_enum: STRING
- received: INTEGER
- received\_enum: STRING
- usage: INTEGER
- usage\_enum: STRING
- subnode\_msn: STRING
- subnode\_msn\_enum: STRING

For events that are generated by situations in the Networks attribute group, events are sent by using the ITM\_KVM\_NETWORKS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- network: STRING
- network\_enum: STRING
- overall\_status: STRING
- overall\_status\_enum: STRING
- network\_type: STRING
- network\_type\_enum: STRING
- number\_of\_hosts: INTEGER
- number\_of\_hosts\_enum: STRING
- number\_of\_vms: INTEGER
- number\_of\_vms\_enum: STRING
- distributed\_switch: STRING
- distributed\_switch\_enum: STRING

For events that are generated by situations in the Performance Object Status attribute group, events are sent by using the ITM\_KVM\_PERFORMANCE\_OBJECT\_STATUS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- query\_name: STRING
- object\_name: STRING
- object\_type: INTEGER
- object\_type\_enum: STRING
- object\_status: INTEGER
- object\_status\_enum: STRING
- error\_code: INTEGER
- error\_code\_enum: STRING
- last\_collection\_start: STRING
- last\_collection\_start\_enum: STRING
- last\_collection\_finished: STRING
- last\_collection\_finished\_enum: STRING
- last\_collection\_duration: REAL

- average\_collection\_duration: REAL
- average\_collection\_duration\_enum: STRING
- refresh\_interval: INTEGER
- number\_of\_collections: INTEGER
- cache\_hits: INTEGER
- cache\_misses: INTEGER
- cache\_hit\_percent: REAL
- intervals\_skipped: INTEGER

For events that are generated by situations in the Resource Pool CPU attribute group, events are sent by using the ITM\_KVM\_RESOURCE\_POOL\_CPU event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- server\_hostname: STRING
- server\_hostname\_enum: STRING
- parent\_name: STRING
- parent\_name\_enum: STRING
- pool\_name: STRING
- pool\_name\_enum: STRING
- expandable: INTEGER
- expandable\_enum: STRING
- limit: INTEGER
- limit\_enum: STRING
- reservation: INTEGER
- reservation\_enum: STRING
- share\_level: STRING
- share\_level\_enum: STRING
- shares: INTEGER
- shares\_enum: STRING
- max\_usage: INTEGER
- max\_usage\_enum: STRING
- cpu\_usage: INTEGER
- cpu\_usage\_enum: STRING
- reservation\_used: INTEGER
- reservation\_used\_enum: STRING
- reservation\_used\_vm: INTEGER
- reservation\_used\_vm\_enum: STRING
- unreserved: INTEGER
- unreserved\_enum: STRING
- unreserved\_vm: INTEGER
- unreserved\_vm\_enum: STRING
- percent\_reserved\_vms: INTEGER
- percent\_reserved\_vms\_enum: STRING
- percent\_overall\_usage: INTEGER
- percent\_overall\_usage\_enum: STRING

- nodeid: STRING

For events that are generated by situations in the Resource Pool General attribute group, events are sent by using the ITM\_KVM\_RESOURCE\_POOL\_GENERAL event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- server\_hostname: STRING
- server\_hostname\_enum: STRING
- parent\_name: STRING
- parent\_name\_enum: STRING
- pool\_name: STRING
- pool\_name\_enum: STRING
- number\_vms: INTEGER
- number\_vms\_enum: STRING
- number\_vms\_on: INTEGER
- number\_vms\_on\_enum: STRING
- number\_child\_pools: INTEGER
- number\_child\_pools\_enum: STRING
- cpu\_usage: INTEGER
- cpu\_usage\_enum: STRING
- memory\_usage: INTEGER
- memory\_usage\_enum: STRING
- kvm\_status: STRING
- kvm\_status\_enum: STRING
- nodeid: STRING

For events that are generated by situations in the Resource Pool Memory attribute group, events are sent by using the ITM\_KVM\_RESOURCE\_POOL\_MEMORY event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- server\_hostname: STRING
- server\_hostname\_enum: STRING
- parent\_name: STRING
- parent\_name\_enum: STRING
- pool\_name: STRING
- pool\_name\_enum: STRING
- expandable: INTEGER
- expandable\_enum: STRING
- limit: INTEGER
- limit\_enum: STRING
- reservation: INTEGER
- reservation\_enum: STRING
- share\_level: STRING
- share\_level\_enum: STRING

- shares: INTEGER
- shares\_enum: STRING
- max\_usage: INTEGER
- max\_usage\_enum: STRING
- memory\_usage: INTEGER
- memory\_usage\_enum: STRING
- reservation\_used: INTEGER
- reservation\_used\_enum: STRING
- reservation\_used\_vm: INTEGER
- reservation\_used\_vm\_enum: STRING
- unreserved: INTEGER
- unreserved\_enum: STRING
- unreserved\_vm: INTEGER
- unreserved\_vm\_enum: STRING
- percent\_reserved\_vms: INTEGER
- percent\_reserved\_vms\_enum: STRING
- percent\_overall\_usage: INTEGER
- percent\_overall\_usage\_enum: STRING
- nodeid: STRING

For events that are generated by situations in the Server attribute group, events are sent by using the ITM\_KVM\_SERVER event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- server\_hostname: STRING
- server\_hostname\_enum: STRING
- system\_up\_time: INTEGER
- system\_up\_time\_enum: STRING
- connection\_state: STRING
- connection\_state\_enum: STRING
- product: STRING
- product\_enum: STRING
- build\_number: STRING
- build\_number\_enum: STRING
- version: STRING
- version\_enum: STRING
- vmotion\_enabled: STRING
- vmotion\_enabled\_enum: STRING
- overall\_status: STRING
- overall\_status\_enum: STRING
- number\_vms: INTEGER
- number\_vms\_enum: STRING
- number\_vms\_on: INTEGER
- number\_vms\_on\_enum: STRING
- physical\_cpus: INTEGER

- physical\_cpus\_enum: STRING
- nics: INTEGER
- nics\_enum: STRING
- physical\_memory: INTEGER
- physical\_memory\_enum: STRING
- overall\_cpu\_util: INTEGER
- overall\_cpu\_util\_enum: STRING
- overall\_memory\_util: INTEGER
- overall\_memory\_util\_enum: STRING
- avg\_vm\_cpu\_percent\_rdy: REAL
- avg\_vm\_cpu\_percent\_rdy\_enum: STRING
- uuid: STRING
- uuid\_enum: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- datacenter\_moref: STRING
- datacenter\_moref\_enum: STRING
- total\_cpu\_mhz: INTEGER
- total\_cpu\_mhz\_enum: STRING
- cluster: STRING
- cluster\_enum: STRING
- datastore\_space: INTEGER
- datastore\_space\_enum: STRING
- used\_datastore: INTEGER
- used\_datastore\_enum: STRING
- maintenance\_mode: INTEGER
- maintenance\_mode\_enum: STRING
- nodeid: STRING
- total\_vm\_configured\_memory: REAL
- total\_vm\_configured\_memory\_enum: STRING
- total\_vm\_provisioned\_space: REAL
- total\_vm\_provisioned\_space\_enum: STRING
- fully\_qualified\_name: STRING
- fully\_qualified\_name\_enum: STRING
- cpu\_packages: INTEGER
- cpu\_packages\_enum: STRING
- processor\_family: STRING
- processor\_family\_enum: STRING
- system\_vendor: STRING
- system\_vendor\_enum: STRING
- system\_model: STRING
- system\_model\_enum: STRING
- bios\_date: STRING
- bios\_date\_enum: STRING
- hyperthreading\_enabled: INTEGER

- hyperthreading\_enabled\_enum: STRING
- performance\_error\_rate: INTEGER
- performance\_error\_rate\_enum: STRING
- performance\_error\_pct: REAL
- performance\_error\_pct\_enum: STRING
- latency: REAL
- latency\_enum: STRING
- demand: INTEGER
- demand\_enum: STRING
- used\_cpu\_mhz: INTEGER
- used\_cpu\_mhz\_enum: STRING
- energy\_usage: INTEGER
- energy\_usage\_enum: STRING
- power\_usage: INTEGER
- power\_usage\_enum: STRING
- power\_capacity: INTEGER
- power\_capacity\_enum: STRING
- ip\_address: STRING
- ip\_address\_enum: STRING
- serial\_number: STRING
- serial\_number\_enum: STRING
- storage\_adapter\_max\_latency: INTEGER
- storage\_adapter\_max\_latency\_enum: STRING
- storage\_path\_max\_latency: INTEGER
- storage\_path\_max\_latency\_enum: STRING
- power\_state: STRING
- power\_state\_enum: STRING

For events that are generated by situations in the Server CPU attribute group, events are sent by using the ITM\_KVM\_SERVER\_CPU event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- server\_hostname: STRING
- server\_hostname\_enum: STRING
- cpu\_number: INTEGER
- cpu\_number\_enum: STRING
- cpu\_utilization: INTEGER
- cpu\_utilization\_enum: STRING
- nodeid: STRING
- core\_utilization: REAL
- core\_utilization\_enum: STRING

For events that are generated by situations in the Server DataStore attribute group, events are sent by using the ITM\_KVM\_SERVER\_DATASTORE event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING

- server\_hostname: STRING
- server\_hostname\_enum: STRING
- name: STRING
- name\_enum: STRING
- free\_space: INTEGER
- free\_space\_enum: STRING
- used\_space: INTEGER
- used\_space\_enum: STRING
- maximum\_file\_size: INTEGER
- maximum\_file\_size\_enum: STRING
- capacity: INTEGER
- capacity\_enum: STRING
- percent\_used: INTEGER
- percent\_used\_enum: STRING
- percent\_free: INTEGER
- percent\_free\_enum: STRING
- type: STRING
- type\_enum: STRING
- datastore\_moref: STRING
- datastore\_moref\_enum: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- overall\_status: STRING
- overall\_status\_enum: STRING
- nodeid: STRING
- read\_latency: INTEGER
- read\_latency\_enum: STRING
- write\_latency: INTEGER
- write\_latency\_enum: STRING

For events that are generated by situations in the Server Disk attribute group, events are sent by using the ITM\_KVM\_SERVER\_DISK event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- server\_hostname: STRING
- server\_hostname\_enum: STRING
- disk\_name: STRING
- disk\_name\_enum: STRING
- read: INTEGER
- read\_enum: STRING
- write: INTEGER
- write\_enum: STRING
- number\_read: INTEGER
- number\_read\_enum: STRING
- number\_write: INTEGER

- number\_write\_enum: STRING
- bus\_resets: INTEGER
- bus\_resets\_enum: STRING
- commands: INTEGER
- commands\_enum: STRING
- commands\_aborted: INTEGER
- commands\_aborted\_enum: STRING
- device\_latency: INTEGER
- device\_latency\_enum: STRING
- device\_read\_latency: INTEGER
- device\_read\_latency\_enum: STRING
- device\_write\_latency: INTEGER
- device\_write\_latency\_enum: STRING
- device\_total\_latency: INTEGER
- device\_total\_latency\_enum: STRING
- kernel\_latency: INTEGER
- kernel\_latency\_enum: STRING
- kernel\_read\_latency: INTEGER
- kernel\_read\_latency\_enum: STRING
- kernel\_write\_latency: INTEGER
- kernel\_write\_latency\_enum: STRING
- kernel\_total\_latency: INTEGER
- kernel\_total\_latency\_enum: STRING
- queue\_latency: INTEGER
- queue\_latency\_enum: STRING
- queue\_read\_latency: INTEGER
- queue\_read\_latency\_enum: STRING
- queue\_write\_latency: INTEGER
- queue\_write\_latency\_enum: STRING
- queue\_total\_latency: INTEGER
- queue\_total\_latency\_enum: STRING
- total\_read\_latency: INTEGER
- total\_read\_latency\_enum: STRING
- total\_write\_latency: INTEGER
- total\_write\_latency\_enum: STRING
- total\_latency: INTEGER
- total\_latency\_enum: STRING
- backing\_datastore: STRING
- backing\_datastore\_enum: STRING
- nodeid: STRING

For events that are generated by situations in the Server HBA attribute group, events are sent by using the ITM\_KVM\_SERVER\_HBA event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING



- server\_hostname: STRING
- server\_hostname\_enum: STRING
- bus: INTEGER
- bus\_enum: STRING
- device: STRING
- device\_enum: STRING
- driver: STRING
- driver\_enum: STRING
- model: STRING
- model\_enum: STRING
- pci\_id: STRING
- pci\_id\_enum: STRING
- kvm\_status: STRING
- kvm\_status\_enum: STRING
- nodeid: STRING
- read: INTEGER
- read\_enum: STRING
- write: INTEGER
- write\_enum: STRING
- read\_latency: INTEGER
- read\_latency\_enum: STRING
- write\_latency: INTEGER
- write\_latency\_enum: STRING
- speed: INTEGER
- speed\_enum: STRING
- current\_link\_speed: INTEGER
- current\_link\_speed\_enum: STRING
- max\_link\_speed: INTEGER
- max\_link\_speed\_enum: STRING
- storage\_adapter\_throughput\_usage: INTEGER
- storage\_adapter\_throughput\_usage\_enum: STRING
- hba\_type: STRING
- hba\_type\_enum: STRING

For events that are generated by situations in the Server Health attribute group, events are sent by using the ITM\_KVM\_SERVER\_HEALTH event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- server\_hostname: STRING
- server\_hostname\_enum: STRING
- sensor\_type: STRING
- sensor\_type\_enum: STRING
- sensor\_name: STRING
- sensor\_name\_enum: STRING
- sensor\_status: STRING

- sensor\_status\_enum: STRING
- sensor\_value: REAL
- sensor\_value\_enum: STRING
- sensor\_units: STRING
- sensor\_units\_enum: STRING
- nodeid: STRING

For events that are generated by situations in the Server Memory attribute group, events are sent by using the ITM\_KVM\_SERVER\_MEMORY event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- server\_hostname: STRING
- server\_hostname\_enum: STRING
- physical\_memory: INTEGER
- physical\_memory\_enum: STRING
- memory\_usage: INTEGER
- memory\_usage\_enum: STRING
- service\_console: INTEGER
- service\_console\_enum: STRING
- memory\_utilization: INTEGER
- memory\_utilization\_enum: STRING
- active\_memory: INTEGER
- active\_memory\_enum: STRING
- granted\_memory: INTEGER
- granted\_memory\_enum: STRING
- swap\_used: INTEGER
- swap\_used\_enum: STRING
- free\_memory: INTEGER
- free\_memory\_enum: STRING
- balloon\_used: INTEGER
- balloon\_used\_enum: STRING
- swap\_in\_rate: INTEGER
- swap\_in\_rate\_enum: STRING
- swap\_out\_rate: INTEGER
- swap\_out\_rate\_enum: STRING
- swap\_total\_rate: INTEGER
- swap\_total\_rate\_enum: STRING
- nodeid: STRING
- active\_write: INTEGER
- active\_write\_enum: STRING
- swap\_in\_rate\_host\_cache: INTEGER
- swap\_in\_rate\_host\_cache\_enum: STRING
- swap\_out\_rate\_host\_cache: INTEGER
- swap\_out\_rate\_host\_cache\_enum: STRING
- low\_free\_threshold: INTEGER

- low\_free\_threshold\_enum: STRING
- granted\_max\_memory: INTEGER
- granted\_max\_memory\_enum: STRING
- granted\_min\_memory: INTEGER
- granted\_min\_memory\_enum: STRING

For events that are generated by situations in the Server Network attribute group, events are sent by using the ITM\_KVM\_SERVER\_NETWORK event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- server\_hostname: STRING
- server\_hostname\_enum: STRING
- nic\_name: STRING
- nic\_name\_enum: STRING
- usage: INTEGER
- usage\_enum: STRING
- transmitted: INTEGER
- transmitted\_enum: STRING
- received: INTEGER
- received\_enum: STRING
- pkts\_received: INTEGER
- pkts\_received\_enum: STRING
- pkts\_transmitted: INTEGER
- pkts\_transmitted\_enum: STRING
- kvm\_status: STRING
- kvm\_status\_enum: STRING
- link\_speed: INTEGER
- link\_speed\_enum: STRING
- duplex: STRING
- duplex\_enum: STRING
- virtual\_switch: STRING
- virtual\_switch\_enum: STRING
- link\_utilization: REAL
- link\_utilization\_enum: STRING
- nodeid: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- cluster: STRING
- cluster\_enum: STRING
- transmit\_pkts\_dropped: INTEGER
- transmit\_pkts\_dropped\_enum: STRING
- receive\_pkts\_dropped: INTEGER
- receive\_pkts\_dropped\_enum: STRING
- pkts\_dropped: INTEGER
- pkts\_dropped\_enum: STRING

- physical\_addr: STRING
- physical\_addr\_enum: STRING

For events that are generated by situations in the Server SAN attribute group, events are sent by using the ITM\_KVM\_SERVER\_SAN event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- disk\_name: STRING
- disk\_name\_enum: STRING
- datastore: STRING
- datastore\_enum: STRING
- paths: INTEGER
- paths\_enum: STRING
- broken\_paths: INTEGER
- broken\_paths\_enum: STRING
- disabled\_paths: INTEGER
- disabled\_paths\_enum: STRING
- path\_selection\_policy: STRING
- path\_selection\_policy\_enum: STRING
- nodeid: STRING

For events that are generated by situations in the Server Virtual Switches attribute group, events are sent by using the ITM\_KVM\_SERVER\_VIRTUAL\_SWITCHES event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- server\_hostname: STRING
- server\_hostname\_enum: STRING
- switch: STRING
- switch\_enum: STRING
- network: STRING
- network\_enum: STRING
- number\_of\_nics: INTEGER
- number\_of\_nics\_enum: STRING
- transmitted: INTEGER
- transmitted\_enum: STRING
- received: INTEGER
- received\_enum: STRING
- usage: INTEGER
- usage\_enum: STRING

For events that are generated by situations in the Server VM Datastore Utilization attribute group, events are sent by using the ITM\_KVM\_SERVER\_VM\_DATASTORE\_UTILIZATION event class. This event class contains the following slots:

- node: STRING

- timestamp: STRING
- name: STRING
- name\_enum: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- virtual\_machine: STRING
- virtual\_machine\_enum: STRING
- committed: REAL
- committed\_enum: STRING
- uncommitted: REAL
- uncommitted\_enum: STRING
- provisioned: REAL
- provisioned\_enum: STRING
- unshared: REAL
- unshared\_enum: STRING
- percent\_committed: REAL
- percent\_committed\_enum: STRING
- nodeid: STRING

For events that are generated by situations in the SubNode Events attribute group, events are sent by using the ITM\_KVM\_SUBNODE\_EVENTS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- server\_hostname: STRING
- server\_hostname\_enum: STRING
- event\_seq\_number: INTEGER
- event\_seq\_number\_enum: STRING
- userid: STRING
- userid\_enum: STRING
- event\_time: STRING
- event\_time\_enum: STRING
- event: STRING
- event\_enum: STRING
- compute\_resource: STRING
- compute\_resource\_enum: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- virtual\_machine: STRING
- virtual\_machine\_enum: STRING
- virtual\_machine\_uuid: STRING
- virtual\_machine\_uuid\_enum: STRING
- esx\_server\_uuid: STRING
- esx\_server\_uuid\_enum: STRING
- category: STRING
- category\_enum: STRING

- event\_type: STRING
- event\_type\_enum: STRING
- event\_text: STRING
- event\_text\_enum: STRING
- event\_type\_id: STRING
- event\_type\_id\_enum: STRING
- entity\_type: STRING
- entity\_type\_enum: STRING

For events that are generated by situations in the Tasks attribute group, events are sent by using the ITM\_KVM\_TASKS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- source\_hostname: STRING
- source\_hostname\_enum: STRING
- name: STRING
- name\_enum: STRING
- target\_entity: STRING
- target\_entity\_enum: STRING
- kvm\_status: STRING
- kvm\_status\_enum: STRING
- initiated\_by: STRING
- initiated\_by\_enum: STRING
- queue\_time: STRING
- queue\_time\_enum: STRING
- start\_time: STRING
- start\_time\_enum: STRING
- completed\_time: STRING
- completed\_time\_enum: STRING
- target\_entity\_type: STRING
- target\_entity\_type\_enum: STRING
- error\_message: STRING
- error\_message\_enum: STRING

For events that are generated by situations in the Thread Pool Status attribute group, events are sent by using the ITM\_KVM\_THREAD\_POOL\_STATUS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- thread\_pool\_size: INTEGER
- thread\_pool\_size\_enum: STRING
- thread\_pool\_max\_size: INTEGER
- thread\_pool\_max\_size\_enum: STRING
- thread\_pool\_active\_threads: INTEGER
- thread\_pool\_active\_threads\_enum: STRING
- thread\_pool\_avg\_active\_threads: REAL
- thread\_pool\_avg\_active\_threads\_enum: STRING

- thread\_pool\_min\_active\_threads: INTEGER
- thread\_pool\_min\_active\_threads\_enum: STRING
- thread\_pool\_max\_active\_threads: INTEGER
- thread\_pool\_max\_active\_threads\_enum: STRING
- thread\_pool\_queue\_length: INTEGER
- thread\_pool\_queue\_length\_enum: STRING
- thread\_pool\_avg\_queue\_length: REAL
- thread\_pool\_avg\_queue\_length\_enum: STRING
- thread\_pool\_min\_queue\_length: INTEGER
- thread\_pool\_min\_queue\_length\_enum: STRING
- thread\_pool\_max\_queue\_length: INTEGER
- thread\_pool\_max\_queue\_length\_enum: STRING
- thread\_pool\_avg\_job\_wait: REAL
- thread\_pool\_avg\_job\_wait\_enum: STRING
- thread\_pool\_total\_jobs: INTEGER
- thread\_pool\_total\_jobs\_enum: STRING

For events that are generated by situations in the Topological Events attribute group, events are sent by using the ITM\_KVM\_TOPOLOGICAL\_EVENTS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- entity\_type: STRING
- entity\_type\_enum: STRING
- event\_type: STRING
- event\_type\_enum: STRING
- host\_uuid: STRING
- host\_uuid\_enum: STRING
- vm\_uuid: STRING
- vm\_uuid\_enum: STRING
- msn: STRING
- msn\_enum: STRING
- name: STRING
- name\_enum: STRING
- datastore\_uuid: STRING
- datastore\_uuid\_enum: STRING
- server\_hostname: STRING
- server\_hostname\_enum: STRING

For events that are generated by situations in the Topology attribute group, events are sent by using the ITM\_KVM\_TOPOLOGY event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- nodename: STRING
- nodeid: STRING
- nodetype: STRING
- nodestatus: STRING

- connecttonode: STRING
- connectiontype: STRING
- msn: STRING
- msn\_enum: STRING
- datacenter: STRING
- datacenter\_enum: STRING

For events that are generated by situations in the Triggered Alarms attribute group, events are sent by using the ITM\_KVM\_TRIGGERED\_ALARMS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- alarm\_status: STRING
- alarm\_status\_enum: STRING
- alarm\_triggered\_time: STRING
- alarm\_triggered\_time\_enum: STRING
- alarm\_name: STRING
- alarm\_name\_enum: STRING
- description: STRING
- description\_enum: STRING
- triggered\_entity: STRING
- triggered\_entity\_enum: STRING
- affected\_entity: STRING
- affected\_entity\_enum: STRING

For events that are generated by situations in the vCenters attribute group, events are sent by using the ITM\_KVM\_VCENERS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- configured\_address: STRING
- fqdn: STRING
- fqdn\_enum: STRING
- ip\_address: STRING
- ip\_address\_enum: STRING
- web\_services\_port: INTEGER
- web\_services\_port\_enum: STRING
- agent\_connection: INTEGER
- agent\_connection\_enum: STRING
- type: STRING
- type\_enum: STRING
- inventory\_age: REAL
- inventory\_age\_enum: STRING
- current\_cu\_execution\_time: REAL
- current\_cu\_execution\_time\_enum: STRING
- average\_cu\_execution\_time: REAL



- average\_cu\_execution\_time\_enum: STRING
- current\_cu\_queue\_time: REAL
- current\_cu\_queue\_time\_enum: STRING
- average\_cu\_queue\_time: REAL
- average\_cu\_queue\_time\_enum: STRING
- collection\_units: INTEGER
- collection\_units\_enum: STRING
- queued\_collection\_units: INTEGER
- queued\_collection\_units\_enum: STRING
- executing\_collection\_units: INTEGER
- executing\_collection\_units\_enum: STRING

For events that are generated by situations in the Virtual Machines attribute group, events are sent by using the ITM\_KVM\_VIRTUAL\_MACHINES event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- vm\_name: STRING
- vm\_name\_enum: STRING
- vm\_server\_name: STRING
- vm\_server\_name\_enum: STRING
- power\_status: STRING
- power\_status\_enum: STRING
- up\_time: INTEGER
- up\_time\_enum: STRING
- heartbeats: INTEGER
- heartbeats\_enum: STRING
- guestos\_name: STRING
- guestos\_name\_enum: STRING
- guest\_state: STRING
- guest\_state\_enum: STRING
- ip\_address: STRING
- ip\_address\_enum: STRING
- kvm\_hostname: STRING
- kvm\_hostname\_enum: STRING
- num\_cpus: INTEGER
- num\_cpus\_enum: STRING
- resource\_pool: STRING
- resource\_pool\_enum: STRING
- memory\_size: INTEGER
- memory\_size\_enum: STRING
- memory\_limit: INTEGER
- memory\_limit\_enum: STRING
- tools\_status: STRING
- tools\_status\_enum: STRING
- vm\_os\_type: INTEGER

- vm\_os\_type\_enum: STRING
- cpu\_utilization: INTEGER
- cpu\_utilization\_enum: STRING
- cpu\_shares: INTEGER
- cpu\_shares\_enum: STRING
- memory\_shares: INTEGER
- memory\_shares\_enum: STRING
- fault\_tolerance: INTEGER
- fault\_tolerance\_enum: STRING
- vm\_percent\_rdy: REAL
- vm\_percent\_rdy\_enum: STRING
- uuid: STRING
- uuid\_enum: STRING
- moref: STRING
- moref\_enum: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- overall\_status: STRING
- overall\_status\_enum: STRING
- used\_cpu\_mhz: INTEGER
- used\_cpu\_mhz\_enum: STRING
- cluster: STRING
- cluster\_enum: STRING
- nodeid: STRING
- cpu\_reservation: INTEGER
- cpu\_reservation\_enum: STRING
- memory\_reservation: INTEGER
- memory\_reservation\_enum: STRING
- cpu\_limit: INTEGER
- cpu\_limit\_enum: STRING
- guestos\_msn: STRING
- guestos\_msn\_enum: STRING
- number\_of\_snapshots: INTEGER
- number\_of\_snapshots\_enum: STRING
- template: INTEGER
- template\_enum: STRING
- snapshot\_storage\_consumed: INTEGER
- snapshot\_storage\_consumed\_enum: STRING
- storage\_drs\_enable: INTEGER
- storage\_drs\_enable\_enum: STRING
- connection\_state: STRING
- connection\_state\_enum: STRING

For events that are generated by situations in the Virtual Switches attribute group, events are sent by using the ITM\_KVM\_VIRTUAL\_SWITCHES event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- server\_hostname: STRING
- server\_hostname\_enum: STRING
- switch: STRING
- switch\_enum: STRING
- number\_of\_nics: INTEGER
- number\_of\_nics\_enum: STRING
- transmitted: INTEGER
- transmitted\_enum: STRING
- received: INTEGER
- received\_enum: STRING
- usage: INTEGER
- usage\_enum: STRING
- subnode\_msn: STRING
- subnode\_msn\_enum: STRING

For events that are generated by situations in the VM CPU attribute group, events are sent by using the ITM\_KVM\_VM\_CPU event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- vm\_name: STRING
- vm\_name\_enum: STRING
- vm\_server\_name: STRING
- vm\_server\_name\_enum: STRING
- cpu\_number: INTEGER
- cpu\_number\_enum: STRING
- wait\_time: INTEGER
- wait\_time\_enum: STRING
- used\_time: INTEGER
- used\_time\_enum: STRING
- ready\_time: INTEGER
- ready\_time\_enum: STRING
- sys\_time: INTEGER
- sys\_time\_enum: STRING
- utilization: INTEGER
- utilization\_enum: STRING
- percent\_rdy: INTEGER
- percent\_rdy\_enum: STRING
- vm\_name\_cpu\_number: STRING
- vm\_name\_cpu\_number\_enum: STRING
- user\_time: INTEGER
- user\_time\_enum: STRING

- vm\_hostname: STRING
- vm\_hostname\_enum: STRING
- vm\_os\_type: INTEGER
- vm\_os\_type\_enum: STRING
- nodeid: STRING

For events that are generated by situations in the VM Datastore Utilization attribute group, events are sent by using the ITM\_KVM\_VM\_DATASTORE\_UTILIZATION event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- name: STRING
- name\_enum: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- virtual\_machine: STRING
- virtual\_machine\_enum: STRING
- committed: REAL
- committed\_enum: STRING
- uncommitted: REAL
- uncommitted\_enum: STRING
- provisioned: REAL
- provisioned\_enum: STRING
- unshared: REAL
- unshared\_enum: STRING
- percent\_committed: REAL
- percent\_committed\_enum: STRING
- total\_read\_kbps: INTEGER
- total\_read\_kbps\_enum: STRING
- total\_write\_kbps: INTEGER
- total\_write\_kbps\_enum: STRING
- total\_io\_kbps: INTEGER
- total\_io\_kbps\_enum: STRING
- nodeid: STRING

For events that are generated by situations in the VM Disk attribute group, events are sent by using the ITM\_KVM\_VM\_DISK event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- vm\_name: STRING
- vm\_name\_enum: STRING
- vm\_server\_name: STRING
- vm\_server\_name\_enum: STRING
- description: STRING
- description\_enum: STRING
- access: STRING

- access\_enum: STRING
- capacity: INTEGER
- capacity\_enum: STRING
- removable: STRING
- removable\_enum: STRING
- connected: STRING
- connected\_enum: STRING
- vm\_hostname: STRING
- vm\_hostname\_enum: STRING
- vm\_os\_type: INTEGER
- vm\_os\_type\_enum: STRING
- disk\_shares: INTEGER
- disk\_shares\_enum: STRING
- backing\_datastore: STRING
- backing\_datastore\_enum: STRING
- nodeid: STRING

For events that are generated by situations in the VM Disk Performance attribute group, events are sent by using the ITM\_KVM\_VM\_DISK\_PERFORMANCE event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- virtual\_machine: STRING
- virtual\_machine\_enum: STRING
- disk\_name: STRING
- disk\_name\_enum: STRING
- read: INTEGER
- read\_enum: STRING
- write: INTEGER
- write\_enum: STRING
- number\_read: INTEGER
- number\_read\_enum: STRING
- number\_write: INTEGER
- number\_write\_enum: STRING
- moref: STRING
- moref\_enum: STRING

For events that are generated by situations in the VM Memory attribute group, events are sent by using the ITM\_KVM\_VM\_MEMORY event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- vm\_name: STRING
- vm\_name\_enum: STRING
- vm\_server\_name: STRING
- vm\_server\_name\_enum: STRING
- total\_size: INTEGER

- total\_size\_enum: STRING
- max\_alloc: INTEGER
- max\_alloc\_enum: STRING
- min\_alloc: INTEGER
- min\_alloc\_enum: STRING
- host\_usage: INTEGER
- host\_usage\_enum: STRING
- swap\_to\_file: INTEGER
- swap\_to\_file\_enum: STRING
- balloon\_usage: INTEGER
- balloon\_usage\_enum: STRING
- guest\_usage: INTEGER
- guest\_usage\_enum: STRING
- host\_util: INTEGER
- host\_util\_enum: STRING
- guest\_util: INTEGER
- guest\_util\_enum: STRING
- vm\_hostname: STRING
- vm\_hostname\_enum: STRING
- vm\_os\_type: INTEGER
- vm\_os\_type\_enum: STRING
- host\_free: INTEGER
- host\_free\_enum: STRING
- guest\_free: INTEGER
- guest\_free\_enum: STRING
- nodeid: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- usage: REAL
- usage\_enum: STRING
- active: INTEGER
- active\_enum: STRING
- shared: INTEGER
- shared\_enum: STRING
- granted: INTEGER
- granted\_enum: STRING

For events that are generated by situations in the VM Network attribute group, events are sent by using the ITM\_KVM\_VM\_NETWORK event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- vm\_name: STRING
- vm\_name\_enum: STRING
- vm\_server\_name: STRING
- vm\_server\_name\_enum: STRING

- description: STRING
- description\_enum: STRING
- physical\_addr: STRING
- physical\_addr\_enum: STRING
- transmitted: INTEGER
- transmitted\_enum: STRING
- received: INTEGER
- received\_enum: STRING
- pkts\_trans: INTEGER
- pkts\_trans\_enum: STRING
- pkts\_recd: INTEGER
- pkts\_recd\_enum: STRING
- vm\_hostname: STRING
- vm\_hostname\_enum: STRING
- vm\_os\_type: INTEGER
- vm\_os\_type\_enum: STRING
- network\_name: STRING
- network\_name\_enum: STRING
- switch: STRING
- switch\_enum: STRING
- nodeid: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- cluster: STRING
- cluster\_enum: STRING

For events that are generated by situations in the VM Orphaned Disk attribute group, events are sent by using the ITM\_KVM\_VM\_ORPHANED\_DISK event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- kvm\_source: STRING
- kvm\_source\_enum: STRING
- datacenter: STRING
- datacenter\_enum: STRING
- datastore\_cluster: STRING
- datastore\_cluster\_enum: STRING
- datastore: STRING
- datastore\_enum: STRING
- file\_path: STRING
- file\_path\_enum: STRING
- file\_size: INTEGER
- file\_size\_enum: STRING
- last\_modified: STRING
- last\_modified\_enum: STRING
- owner: STRING

- owner\_enum: STRING

For events that are generated by situations in the VM Partition attribute group, events are sent by using the ITM\_KVM\_VM\_PARTITION event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- vm\_name: STRING
- vm\_name\_enum: STRING
- vm\_server\_name: STRING
- vm\_server\_name\_enum: STRING
- description: STRING
- description\_enum: STRING
- capacity: INTEGER
- capacity\_enum: STRING
- free\_space: INTEGER
- free\_space\_enum: STRING
- used\_space: INTEGER
- used\_space\_enum: STRING
- percent\_used: INTEGER
- percent\_used\_enum: STRING
- percent\_free: INTEGER
- percent\_free\_enum: STRING
- vm\_hostname: STRING
- vm\_hostname\_enum: STRING
- vm\_os\_type: INTEGER
- vm\_os\_type\_enum: STRING
- nodeid: STRING

For events that are generated by situations in the VM Snapshot attribute group, events are sent by using the ITM\_KVM\_VM\_SNAPSHOT event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING

For events that are generated by situations in the VM SnapshotFileLayout attribute group, events are sent by using the ITM\_KVM\_VM\_SNAPSHOTFILELAYOUT event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING

For events that are generated by situations in the VM Snapshots attribute group, events are sent by using the ITM\_KVM\_VM\_SNAPSHOTS event class. This event class contains the following slots:

- node: STRING
- timestamp: STRING
- snapshot\_name: STRING
- snapshot\_name\_enum: STRING
- vm\_name: STRING
- vm\_name\_enum: STRING



- creation\_time: STRING
- creation\_time\_enum: STRING
- description: STRING
- description\_enum: STRING
- vm\_state: STRING
- vm\_state\_enum: STRING
- space\_consumed: INTEGER
- space\_consumed\_enum: STRING
- snapshot\_moref: STRING
- snapshot\_moref\_enum: STRING



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## Appendix B. Discovery Library Adapter for the VMware VI agent

The Tivoli Management Services Discovery Library Adapter (DLA) discovers resources and relationships, and creates a Discovery Library Book file for the agent.

### About the DLA

The Book file follows the Discovery Library IdML schema and is used to populate the Configuration Management Database (CMDB) and Tivoli Business Service Manager products. The Tivoli Management Services DLA discovers VMware Virtual Center resources. For all VMware systems that are active and online at the Tivoli Enterprise Portal Server, information is included in the discovery book for those resources. The Tivoli Management Services DLA discovers active resources. It is run on demand and can be run periodically to discover resources that were not active during previous discoveries.

The DLA discovers VMware Virtual Center components.

### More information about DLAs

The following sources contain additional information about using the DLA program with all monitoring agents:

- The *IBM Tivoli Monitoring Administrator's Guide* contains information about using the Tivoli Management Services Discovery Library Adapter.
- For information about using a DLA with Tivoli Application Dependency Discovery Manager (TADDM), see the TADDM Information Center ([http://publib.boulder.ibm.com/infocenter/tivihelp/v10r1/topic/com.ibm.taddm.doc\\_7.2/welcome\\_page/welcome.html](http://publib.boulder.ibm.com/infocenter/tivihelp/v10r1/topic/com.ibm.taddm.doc_7.2/welcome_page/welcome.html)).

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## DLA data model class types represented in CDM

The source application data objects map to classes in the Common Data Model (CDM) for the VMware VI agent.

The following information is provided for each class:

#### CDM class name

Class name for which the agent is providing information

#### Relationships

CDM relationships (hierarchical) between currently identified model objects

#### CDM attributes, agent attributes, descriptions, and examples

CDM and agent attributes that are required to create an instance of a resource, descriptions of the attributes, and examples of the attributes

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## DLA data model classes for VMware VI agent

Each agent that uses the Discovery Library Adapter has DLA data model classes defined for the agent.

The VMware VI agent has the following Discovery Library Adapter data model classes:

- Virtual Center
- Primary SAP
- IpV4Address

- Fqdn
- Data Center
- Cluster
- Data store
- ESX Server
- VMwareESX
- ESX Server Memory
- Virtual Machine
- TMSAgent

## Virtual Center class

A Virtual Center manages multiple data centers and clusters.

### CDM class name

`sys.VMware.VirtualCenter`

### Relationships

contains

- Source: `kvm-KVMVCENTER.IP_ADDRESS-VirtualCenter`
- Target: `kvm-KVMVCENTER.IP_ADDRESS-KVMCLUSTRT.DATACENTER-DataCenter`
- Example: contains source="kvm-9.42.17.191-VirtualCenter" target="kvm-9.42.17.191-Bld-510-DataCenter"

accessedVia

- Source: `kvm-KVMVCENTER.IP_ADDRESS-VirtualCenter`
- Target: `kvm-KVMVCENTER.IP_ADDRESS-PrimarySAP`
- Example: accessedVia source="kvm-9.42.17.191-VirtualCenter" target="kvm-9.42.17.191-PrimarySAP"

### CDM attributes, agent attributes, descriptions, and examples

- CDM attribute: KeyName  
Agent attribute: Not applicable (hardcoded value)  
Description: Always Virtual Center, with no quotation marks  
Example: Virtual Center
- CDM attribute: WebServiceHttpPort  
Agent attribute: Not applicable (hardcoded value)  
Description: Port for Web service on HTTP  
Example: 80
- CDM attribute: ManagedSystemName  
Agent attribute: INODESTS.NODE  
Description: Name of the IBM Tivoli Monitoring component that provides data for the management of the VMware VI agent instance  
Example: kb2kas:ANDREA:VM
- CDM attribute: Label  
Agent attribute: KVMVCENTER.FQDN:80  
Description: String that represents the name of this Virtual Center.  
Example: kb2kas.tivlab.raleigh.ibm.com:80

## Primary SAP class

The Primary SAP class represents an IP address and port combination.

**CDM class name**

net.BindAddress

**Relationships**

bindsTo

- Source: kvm-KVMVCENTER.IP\_ADDRESS-PrimarySAP
- Target: kvm-KVMVCENTER.IP\_ADDRESS-IPv4Address
- Example: bindsTo source="kvm-9.42.17.191-PrimarySAP" target="kvm-9.42.17.191-IPv4Address"

bindsAsPrimary

- Source: kvm-KVMVCENTER.IP\_ADDRESS-PrimarySAP
- Target: kvm-KVMVCENTER.IP\_ADDRESS-IPv4Address
- Example: bindsAsPrimary source="kvm-9.42.17.191-PrimarySAP" target="kvm-9.42.17.191-IPv4Address"

**CDM attributes, agent attributes, descriptions, and examples**

- CDM attribute: PortNumber  
Agent attribute: Not applicable (hardcoded value)  
Description: Web service http port number  
Example: 80
- CDM attribute: Path  
Agent attribute: Not applicable (hardcoded value)  
Description: Path set to (none)  
Example: (none)

**IPv4Address class**

The IPv4Address class represents the Virtual Center IP V4 address.

**CDM class name**

net.IPv4Address

**Relationships**

This class has no relationships.

**CDM attributes, agent attributes, descriptions, and examples**

- CDM attribute: StringNotation  
Agent attribute: KVMVCENTER.IP\_ADDRESS  
Description: IP address in string form  
Example: 9.42.17.191
- CDM attribute: DotNotation  
Agent attribute: KVMVCENTER.IP\_ADDRESS  
Description: IPv4 address in string form  
Example: 9.42.17.191

**Fqdn class**

The Fqdn class represents the fully qualified domain name (FQDN) attribute of an IPAddress.

**CDM class name**

net.Fqdn

**Relationships**

assignedTo

- Source: kvm-KVMVCENTER.IP\_ADDRESS-Fqdn
- Target: kvm-KVMVCENTER.IP\_ADDRESS-IPv4Address

- Example: assignedTo source="kvm-9.42.17.191-Fqdn" target="kvm-9.42.17.191-IpV4Address"

#### CDM attributes, agent attributes, descriptions, and examples

- CDM attribute: Fqdn  
Agent attribute: KVMVCENTER.FQDN  
Description: Virtual Center fully qualified domain name (FQDN)  
Example: kb2kas.tivlab.raleigh.ibm.com

## Data Center class

The Data Center class represents a grouping of individual ESX hosts or clusters.

#### CDM class name

sys.VMware.DataCenter

#### Relationships

contains

- Source: kvm-KVMVCENTER.IP\_ADDRESS-KVMCLUSTRT.DATACENTER-DataCenter
- Target: kvm-KVMVCENTER.IP\_ADDRESS-KVMCLUSTRT.DATACENTER-KVMCLUSTRT.CN-Cluster
- Example: contains source="kvm-9.42.17.191-Bld-510-DataCenter" target="kvm-9.42.17.191-Bld-510-Cluster E-Cluster"

federates

- Source: kvm-KVMVCENTER.IP\_ADDRESS-KVMCLUSTRT.DATACENTER-DataCenter
- Target: kvm-KVMDAG.SN\_RES-ESXServer
- Example: federates source="kvm-9.42.17.191-Bld-510-DataCenter" target="kvm-itm64vm6.tivlab.raleigh.ibm.com-ESXServer"

contains

- Source: kvm-KVMVCENTER.IP\_ADDRESS-KVMCLUSTRT.DATACENTER-DataCenter
- Target: kvm-KVMVCENTER.IP\_ADDRESS-KVMCLUSTRT.DATACENTER-KVMDSTORES.NAME-DataStore
- Example: contains source="kvm-9.42.17.191-Bld-510-DataCenter" target="kvm-9.42.17.191-Bld-510-itm64vm6:storage1-DataStore"

#### CDM attributes, agent attributes, descriptions, and examples

- CDM attribute: Name  
Agent attribute: KVMVCLUSTRT.DM  
Description: Unique managed object ID that represents this entity  
Example: datacenter-2
- CDM attribute: Label  
Agent attribute: KVMVCLUSTRT.DATACENTER  
Description: User-specified string that represents the name of this entity, unique relative to its parent (Virtual Center)  
Example: dBld-510

## Cluster class

A Cluster is a group of ESX hosts that hierarchically share CPU and memory resources among their virtual machines.

#### CDM class name

sys.VMware.VMWareCluster

#### Relationships

federates

- Source: kvm-KVMVCENTER.IP\_ADDRESS-KVMCLUSTRT.DATACENTER-KVMCLUSTRT.CN-Cluster

- Target: `kvm-KVMDAG.SN_RES-ESXServer`
- Example: `federates source="kvm-9.42.17.191-Bld-510-Cluster A-Cluster" target="kvm-itm64vm2.tivlab.raleigh.ibm.com-ESXServer"`

### CDM attributes, agent attributes, descriptions, and examples

- CDM attribute: Name  
Agent attribute: `KVMVCLUSTRT.DM`  
Description: Unique managed object ID that represents this entity  
Example: `domain-c455`
- CDM attribute: Label  
Agent attribute: `KVMVCLUSTRT.CN`  
Description: User-specified string that represents the name of this entity, unique relative to its parent (Data Center)  
Example: `Cluster A`

## Data store class

A Data Store can be viewed as a storage appliance that serves up storage space for many virtual machines across multiple physical hosts.

### CDM class name

`sys.VMware.VMWareDataStore`

### Relationships

basedOn

- Source: `kvm-KVMDAG.SN_RES-KVMSERVDRS.NAME-DataStore`
- Target: `kvm-KVMVCENTER.IP_ADDRESS-KVMCLUSTRT.DATACENTER-KVMDSTORES.NAME-DataStore`
- Example: `basedOn source="kvm-itm64vm4.tivlab.raleigh.ibm.com-iSCSI Disk 1-DataStore" target="kvm-9.42.17.191-Bld-510-iSCSI Disk 1-DataStore"`

### CDM attributes, agent attributes, descriptions, and examples

- CDM attribute: Name  
Agent attribute: `KVMDSTORES.DM`  
Description: Unique managed object ID that represents this entity  
Example: `datastore-13`
- CDM attribute: Label  
Agent attribute: `KVMDSTORES.NAME`  
Description: User-specified string that represents the name of this entity  
Example: `iSCSI Disk 1`
- CDM attribute: Type  
Agent attribute: `KVMDSTORES.TYPE`  
Description: Type of volume (NFS or VMFS)  
Example: `VMFS`
- CDM attribute: DataStoreURL  
Agent attribute: `KVMDSTORES.URL`  
Description: Unique locator of the data store. Used for managing virtual disks and data stores through `virtualdiskmanager`, which takes data store path as one of the parameters.  
Example: `sanfs://vmfs_uuid:46715901-25a31b06-3cf6-000e0c42b828`
- CDM attribute: Capacity  
Agent attribute: `KVMDSTORES.CAPACITY`  
Description: Storage capacity of the data store  
Example: `476672`
- CDM attribute: FreeSpace  
Agent attribute: `KVMDSTORES.FREE_SPACE`  
Description: Amount of available storage for this data store

Example: 152240

- CDM attribute: IsAccessible  
Agent attribute: KVMDSTORES.ACCESSIBLE  
Description: Connectivity status of this data store  
Example: 1

## ESX Server class

The ESX Server class represents the core hypervisor where virtual machines are running.

### CDM class name

sys.VmwareUnitaryComputerSystem

### Relationships

contains

- Source: `kvm-KVMSEVERG.SH-ESXServer`
- Target: `kvm-KVMDAG.SN_RES-KVMSEVRDS.NAME-DataStore`
- Example: `contains source="kvm-itm64vm4.tivlab.raleigh.ibm.com-ESXServer" target="kvm-itm64vm4.tivlab.raleigh.ibm.com-iSCSI Disk 1-DataStore"`

contains

- Source: `kvm-KVMSEVERG.SH-ESXServer`
- Target: `kvm-KVMSEVERG.SH-ESXServer-Memory`
- Example: `contains source="kvm-itm64vm4.tivlab.raleigh.ibm.com-ESXServer" target="kvm-itm64vm4.tivlab.raleigh.ibm.com-ESXServer-Memory"`

### CDM attributes, agent attributes, descriptions, and examples

- CDM attribute: Name  
Agent attribute: KVMSEVERG.SH  
Description: A name for the computer system as it is commonly known in the datacenter  
Example: `itm64vm4.tivlab.raleigh.ibm.com`
- CDM attribute: Label  
Agent attribute: KVMSEVERG.SH  
Description: User-specified string used when displaying a managed element  
Example: `itm64vm4.tivlab.raleigh.ibm.com`
- CDM attribute: UUID  
Agent attribute: KVMSEVERG.UUID  
Description: Attribute to store the UUID (universally unique identifier) of a VMware virtual machine  
Example: `7255E89D-634E-38DB-8D28-D0C083FBDC98`
- CDM attribute: SystemBoardUUID  
Agent attribute: KVMSEVERG.UUID  
Description: Burned-in Globally Unique Identifier (GUID) of the motherboard in the computer  
Example: `7255E89D-634E-38DB-8D28-D0C083FBDC98`
- CDM attribute: Fqdn  
Agent attribute: KVMSEVERG.SH  
Description: Fully qualified host name of the computer system  
Example: `itm64vm4.tivlab.raleigh.ibm.com`
- CDM attribute: NumCPUs  
Agent attribute: KVMSEVERG.PC  
Description: Count of CPU instances contained by the computer system  
Example: 4
- CDM attribute: CPUCoresInstalled



Agent attribute: KVMSERVERG.PC  
Description: Number of CPUCore instances  
Example: 4

- CDM attribute: MemorySize  
Agent attribute: KVMSERVERG.PM (converted to bytes)  
Description: Size of physical memory present in the computer system  
Example: 8588886016
- CDM attribute: ServiceConsoleMemorySize  
Agent attribute: KVMDSTORES.ACCESSIBLE (converted to bytes)  
Description: Amount of memory reserved for the service console  
Example: 285212672
- CDM attribute: VmotionEnabled  
Agent attribute: KVMSERVERG.VE  
Description: Indicates whether VMotion is enabled for this host  
Example: true
- CDM attribute: ManagedSystemName  
Agent attribute: INODESTS.NODE  
Description: Name of the IBM Tivoli Monitoring component that provides data for the management of the VMware VI agent instance  
Example: VM:kb2kas-itm64vm4.tivlab:ESX

## VMwareESX class

VMware ESX is the virtualization operating system that supports a virtual infrastructure within a single physical device, or across multiple physical devices. This operating system currently supports the ability to run on the x86-compatible platform.

### CDM class name

sys.VMware.VmwareESX

### Relationships

#### runsOn

- Source: kvm-KVMSERVERG.SH-ESX
- Target: kvm-KVMSERVERG.SH-ESXServer
- Example: runsOn source="kvm-itm64vm4.tivlab.raleigh.ibm.com-ESX" target="kvm-itm64vm4.tivlab.raleigh.ibm.com-ESXServer"

#### installedOn

- Source: kvm-KVMSERVERG.SH-ESX
- Target: kvm-KVMSERVERG.SH-ESXServer
- Example: installedOn source="kvm-itm64vm4.tivlab.raleigh.ibm.com-ESX" target="kvm-itm64vm4.tivlab.raleigh.ibm.com-ESXServer"

### CDM attributes, agent attributes, descriptions, and examples

- CDM attribute: Name  
Agent attribute: Not applicable (hardcoded value)  
Description: Name of the operating system  
Example: Vmnix
- CDM attribute: OSName  
Agent attribute: String representation of the operating system name.  
Description: Not applicable (hardcoded value)  
Example: Vmnix
- CDM attribute: Label  
Agent attribute: KVMSERVERG.SH  
Description: User-specified string used when displaying a managed element

Example: itm64vm4.tivlab.raleigh.ibm.com

- CDM attribute: OSVersion  
Agent attribute: KVMSERVERG.PRODUCT KVMSERVERG.VERSION build-KVMSERVERG.BN  
Description: Raw text representation of the Operating System version, as reported by the operating system instance using the operating system-specific command to get the version of the operating system.  
Example: VMware ESX Server 3.5.0 build-199239

## ESX Server Memory class

The ESX Server Memory class represents the memory configuration of an ESX Server.

### CDM class name

sys.Memory

### Relationships

This class has no relationships.

### CDM attributes, agent attributes, descriptions, and examples

- CDM attribute: MemorySize  
Agent attribute: KVMSERVERG.PM  
Description: Amount of memory reserved  
Example: 8588886016

## Virtual Machine class

The Virtual Machine class represents a software implementation of a computer that executes programs like a physical machine.

### CDM class name

sys.darwin.DarwinUnitaryComputerSystemsys.dos.  
DosUnitaryComputerSystemsys.freebsd.  
FreeBSDUnitaryComputerSystemsys.linux.LinuxUnitaryComputerSystemsys.  
network.NetworkUnitaryComputerSystemsys.sun.  
SunSPARCUnitaryComputerSystemsys.windows.  
WindowsComputerSystemsys.UnitaryComputerSystem

### Relationships

virtualizes

- Source: kvm-KVMVM\_GEN.VSN-KVMVM\_GEN.VM\_NAME-VirtualMachine
- Target: kvm-KVMVM\_GEN.VSN-ESXServer
- Example: virtualizes source="kvm-itm64vm4.tivlab.raleigh.ibm.com-vi4win2k3-VirtualMachine" target="kvm-itm64vm4.tivlab.raleigh.ibm.com-ESXServer"

### CDM attributes, agent attributes, descriptions, and examples

- CDM attribute: Name  
Agent attribute: KVMVM\_GEN.VM\_NAME  
Description: Name for the computer system as it is commonly known in the data center  
Example: vi4win2k3
- CDM attribute: Label  
Agent attribute: KVMVM\_GEN.VM\_NAME  
Description: User-specified string used when displaying a managed element  
Example: vi4win2k3
- CDM attribute: UUID  
Agent attribute: KVMVM\_GEN.UUID  
Description: Attribute to store UUID (universally unique identifier) of a VMware virtual machine

Example: 502A1106-04AE-9B2A-E266-37CB16B2E7DB

- CDM attribute: SystemBoardUUID  
Agent attribute: KVMVM\_GEN.UUID  
Description: Burned-in globally unique identifier (GUID) of the motherboard in the computer  
Example: 502A1106-04AE-9B2A-E266-37CB16B2E7DB
- CDM attribute: MemoryLimit  
Agent attribute: KVMVM\_GEN.ML  
Description: Maximum memory that can be used by this virtual machine even if more memory or CPU is available in the resource pool  
Example: 1
- CDM attribute: MemoryReservation  
Agent attribute: KVMVM\_GEN.MIN\_ALLOC  
Description: Memory guaranteed for this virtual machine.  
Example: 0
- CDM attribute: MemorySharedValue  
Agent attribute: KVMVM\_GEN.MS0 (MB)  
Description: Actual value of memory shares (used only when level of memory or CPU shares is set to **Custom**).  
Example: 2560
- CDM attribute: MemorySize  
Agent attribute: KVMVM\_GEN.MS0 (converted to bytes)  
Description: Size of physical memory present in the computer system  
Example: Ex - 2684354560
- CDM attribute: CPUSharedValue  
Agent attribute: KVMVM\_GEN.CPU\_SHARES  
Description: Actual value of CPU shares (used only when level of memory or CPU shares is set to **Custom**)  
Example: 2000

## TMSAgent class

The TMSAgent class represents the Tivoli Management Services agent.

### CDM class name

app.TMSAgent

### Relationships

This class has no relationships.

### CDM attributes, agent attributes, descriptions, and examples

- CDM attribute: ManagedObjectName  
Agent attribute: INODESTS.NODE  
Description: Name of the IBM Tivoli Monitoring component that provides data for the management of the VMware VI agent instance  
Example: p@kb2kas:ANDREA:VM
- CDM attribute: SoftwareVersion  
Agent attribute: INODESTS.VERSION  
Description: Version of the VMware VI agent  
Example: 06.22.01
- CDM attribute: ProductCode  
Agent attribute: INODESTS.PRODUCT  
Description: Product code of the VMware VI agent  
Example: VM
- CDM attribute: Affinity

Agent attribute: INODESTS.AFFINITIES  
Description: Affinity of the VMware VI agent  
Example: 00010000000000000000000000000000G0003yw0a7

- CDM attribute: Label  
Agent attribute: INODESTS.NODE - VMware  
Description: Label of the VMware VI agent  
Example: kb2kas:ANDREA:VM - VMware

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## Appendix C. Integration with Tivoli Business Service Manager

VMware VI agent provides data to create, update the status of, and view IBM Tivoli Business Service Manager services.

The Tivoli Management Services Discovery Library Adapter (DLA) and Discovery Library Toolkit provides data for the Tivoli Business Service Manager service models. The Tivoli Integration Facility (EIF) probe updates the status of these services, and you use the Tivoli Enterprise Portal to view the data for the services. To implement the integration of the agent with Tivoli Business Service Manager, perform the integration tasks.

---

### Components for integrating with Tivoli Business Service Manager

The data for integrating with Tivoli Business Service Manager is supplied through the following components: Tivoli Management Services Discovery Library Adapter (DLA) and Discovery Library Toolkit, Tivoli Integration Facility (EIF) probe, and Tivoli Enterprise Portal.

#### Tivoli Management Services Discovery Library Adapter (DLA) and Discovery Library Toolkit

By using data from the Tivoli Management Services Discovery Library Adapter, you can build Tivoli Business Service Manager service models that include resources monitored by the VMware VI agent.

The DLA files can be imported directly into Tivoli Business Service Manager using the Discovery Library Toolkit or they can be loaded into IBM Tivoli Application Dependency Discovery Manager (TADDM) and then fed into Tivoli Business Service Manager using the Discovery Library Toolkit.

See the following sources for more information about the DLA and Discovery Library Toolkit:

- Resources and relationships that are discovered by the VMware VI agent and included in Tivoli Management Services DLA files: Appendix B, “Discovery Library Adapter for the VMware VI agent,” on page 403
- Using the Tivoli Management Services DLA: *IBM Tivoli Monitoring Administrator's Guide*
- Using the Discovery Library Toolkit: *Tivoli Business Service Manager Customization Guide*

#### Tivoli Integration Facility (EIF) probe

Situation events detected by the VMware VI agent can update the status of services in Tivoli Business Service Manager.

The situation events are forwarded from IBM Tivoli Monitoring to the Netcool/OMNIbus Probe for the Tivoli Event Integration Facility. The VMware VI agent provides a probe rules file that updates its events with information to identify the affected service in Tivoli Business Service Manager. The EIF probe then forwards the events to the Netcool/OMNIbus ObjectServer. Tivoli Business Service Manager monitors the Netcool/OMNIbus ObjectServer for new events and updates the status of affected services.

See the following sources for more information about event integration:

- Installation (using an existing EIF probe and Netcool/OMNIbus ObjectServer installation or using Tivoli Business Service Manager to install these components): Netcool/OMNIbus Information Center or the *Tivoli Business Service Manager Installation Guide*.
- Setting up event integration between IBM Tivoli Monitoring, the EIF probe, and the Netcool/OMNIbus ObjectServer: *IBM Tivoli Monitoring Installation and Setup Guide*.

- Configuring the EIF probe to use the VMware VI agent rules file after the EIF probe has been installed and configured for event integration with IBM Tivoli Monitoring: “Configuring the Tivoli Event Integration Facility (EIF) probe to enrich events”

## **Tivoli Enterprise Portal**

You can use the integration of the Tivoli Enterprise Portal with Tivoli Business Service Manager to view the services in the Tivoli Business Service Manager console.

For more detailed examination and analysis, you can easily link from the Tivoli Business Service Manager console to the Tivoli Enterprise Portal to view the data within the VMware VI agent.

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## **Tasks to integrate the agent with Tivoli Business Service Manager**

To integrate the VMware VI agent with Tivoli Business Service Manager, you must install and configure the required components. Then, you can view the data in the Tivoli Integrated Portal

To integrate the VMware VI agent with Tivoli Business Service Manager and view the data, complete the following tasks:

- Install the Discovery Library Toolkit on the Tivoli Business Service Manager server.
- Configure the Tivoli Event Integration Facility (EIF) probe to enrich VMware VI agent events.
- Create a service in the Tivoli Business Service Manager console that you want to monitor.
- Create a data source mapping for each data source that you want to access within the Tivoli Business Service Manager.
- Configure an additional IBM Tivoli Monitoring web service for each Tivoli Enterprise Portal Server.
- View data in the Tivoli Enterprise Portal for the services that you have created to monitor through Tivoli Business Service Manager.

## **Installing the Discovery Library Toolkit on the Tivoli Business Service Manager**

You must install the Discovery Library Toolkit on the Tivoli Business Service Manager server.

The Discovery Library Toolkit imports data from the DLA files and TADDM, which includes information about the hardware and the applications that are discovered by the source.

See “Installing the Discovery Library Toolkit” in the *Tivoli Business Service Manager Installation Guide*.

## **Configuring the Tivoli Event Integration Facility (EIF) probe to enrich events**

The Netcool/OMNIBus Probe for Tivoli Event Integration Facility (EIF) forwards the VMware VI agent events that are received from IBM Tivoli Monitoring to the Netcool/OMNIBus ObjectServer. Tivoli Business Service Manager monitors the Netcool/OMNIBus ObjectServer for new events, and updates the status of affected services. The VMware VI agent provides a probe rules include file that updates its events with information to identify the affected service in Tivoli Business Service Manager.

### **Before you begin**

Install and configure the Netcool/OMNIBus ObjectServer and EIF probe and set up event integration between IBM Tivoli Monitoring and Netcool/OMNIBus.

### **About this task**

To enable event enrichment, configure the EIF probe to use the rules file for the agent.

## Procedure

1. Locate the VMware VI agent rules file (`kvm_tbsm.rules`) on a computer system where the VMware VI agent, Tivoli Enterprise Monitoring Server, or Tivoli Enterprise Portal Server is installed. The file is in the following locations:
  - On Windows systems  
The file is in the *installdir*\cms\TECLIB directory of the monitoring server, in the *installdir*\cnps\TECLIB directory of the portal server, the *installdir*\TMAITM6\EIFLIB directory of the agent, or the *installdir*\TMAITM6\_x64\EIFLIB directory of the agent, where *installdir* is the IBM Tivoli Monitoring or Tivoli Monitoring for Virtual Environments installation directory.
  - On Linux and UNIX systems  
The file is in the *installdir*/tables/cicatrsg/TECLIB directory of the monitoring server or in the *installdir*/platform/xx/TECLIB directory of the agent, where *installdir* is the IBM Tivoli Monitoring or Tivoli Monitoring for Virtual Environments directory, *platform* is the architecture directory for the agent, and *xx* is the product code for the agent.
2. Copy the `kvm_tbsm.rules` file to the following directory on the computer system where the EIF probe is installed:
  - On Windows systems  
`%OMNIHOME%\probes\arch`
  - On UNIX systems  
`$OMNIHOME/probes/arch`Where:  
**OMNIHOME**  
System-defined variable defining the installation location of Netcool/OMNIbus  
**arch** Operating system directory where the probe is installed; for example, `solaris2` when running on a Solaris system, and `win32` for a Windows system.
3. Edit the `tivoli_eif.rules` file and uncomment the include statement for `kvm_tbsm.rules`. (The `tivoli_eif.rules` file is located in the same directory as the `kvm_tbsm.rules` file.) If you are using a version of the `tivoli_eif.rules` file without an include statement for `kvm_tbsm.rules`, add the following line after the include statement for `itm_event.rules`:  
`include "kvm_tbsm.rules"`
4. Restart the EIF probe.

## Creating a service in Tivoli Business Service Manager

You must create a service in the Tivoli Business Service Manager console for each service that you want to monitor.

To create the services that you want to monitor in the Tivoli Business Service Manager console, see “Configuring services” in the *IBM Tivoli Business Service Manager Service Configuration Guide*.

## Creating a data source mapping for each data source

You can create a data source mapping for each data source that you want to access within Tivoli Business Service Manager.

Also, you can create the data fetchers and use the data to create incoming status rules that are populated in your service templates.

For more information, see “Data sources” and “Data fetchers” in the *IBM Tivoli Business Service Manager Service Configuration Guide*.

## Configuring additional IBM Tivoli Monitoring web services

You can configure additional IBM Tivoli Monitoring web services for each Tivoli Enterprise Portal Server.

To configure an additional IBM Tivoli Monitoring web service for each Tivoli Enterprise Portal server, see “Configure TBSM charts” in the *IBM Tivoli Business Service Manager Scenarios Guide*.

## Viewing data in the Tivoli Enterprise Portal

From Tivoli Business Service Manager, you can open the Tivoli Enterprise Portal and view the VMware VI agent.

You can also launch Tivoli Business Service Manager from the Tivoli Enterprise Portal.

For more information about launching applications, see “Launching to and from applications” in the *Tivoli Business Service Manager Customization Guide*.



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## Appendix D. Documentation library

Various publications are relevant to the use of the IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI.

For information about how to access and use the publications, see *Using the publications* ([http://pic.dhe.ibm.com/infocenter/tivihelp/v61r1/topic/com.ibm.itm.doc\\_6.3/common/using\\_publications.htm](http://pic.dhe.ibm.com/infocenter/tivihelp/v61r1/topic/com.ibm.itm.doc_6.3/common/using_publications.htm)).

To find publications from the previous version of a product, click **Previous versions** under the name of the product in the **Contents** pane.

### IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI library

The documentation for this agent and other product components is in the IBM Tivoli Monitoring for Virtual Environments Information Center ([http://pic.dhe.ibm.com/infocenter/tivihelp/v61r1/topic/com.ibm.tivoli.itmvs.doc\\_7.2.0.2/welcome\\_ve72fp2.htm](http://pic.dhe.ibm.com/infocenter/tivihelp/v61r1/topic/com.ibm.tivoli.itmvs.doc_7.2.0.2/welcome_ve72fp2.htm)).

One document is specific to the VMware VI agent. The IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI User's Guide provides agent-specific information for configuring, using, and troubleshooting the VMware VI agent.

The **Prerequisites** topic in the information center contains information about the prerequisites for each component.

Use the information in the user's guide for the agent with the *Tivoli Enterprise Portal User's Guide* to monitor VMware Virtual Center resources.

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### Prerequisite publications

To use the information in this publication effectively, you must have some prerequisite knowledge.

See the following publications to gain the required prerequisite knowledge:

- *IBM Tivoli Monitoring Administrator's Guide*
- *IBM Tivoli Monitoring Agent Builder User's Guide*
- *IBM Tivoli Monitoring Command Reference*
- *IBM Tivoli Monitoring Installation and Setup Guide*
- *IBM Tivoli Monitoring High Availability Guide for Distributed Systems*
- *IBM Tivoli Monitoring: Messages*
- *IBM Tivoli Monitoring Troubleshooting Guide*
- *IBM Tivoli Monitoring: IBM i OS Agent User's Guide*
- *IBM Tivoli Monitoring: Linux OS Agent User's Guide*
- *IBM Tivoli Monitoring: UNIX OS Agent User's Guide*
- *IBM Tivoli Monitoring: Windows OS Agent User's Guide*
- *Tivoli Enterprise Portal User's Guide*
- *IBM Tivoli Performance Analyzer User's Guide*
- *IBM Tivoli Warehouse Proxy Agent User's Guide*
- *IBM Tivoli Warehouse Summarization and Pruning Agent User's Guide*

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## Related publications

The publications in related information centers provide useful information.

See the following information centers, which you can find by accessing Tivoli Documentation Central (<https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/Tivoli%20Documentation%20Central>):

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

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## 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:

- Service Management Connect (SMC)

For introductory information about SMC, see IBM Service Management Connect (<http://www.ibm.com/developerworks/servicemanagement/>).

For information about Tivoli products, see the Application Performance Management community on SMC (<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 external users and developers of Tivoli products where you can access early designs, sprint demos, product roadmaps, and pre-release code.
  - Connect one-on-one with the experts to collaborate and network about Tivoli and Integrated Service Management.
  - Benefit from the expertise and experience of others using blogs.
  - Collaborate with the broader user community using wikis and forums.
- 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.

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