

IBM Tivoli Monitoring for Virtual
Environments Agent for NetApp Storage
7.3 Fix Pack 4

Installation and Configuration Guide



Note

Before using this information and the product it supports, read the information in [“Notices” on page 19.](#)

This edition applies to version 7.3.0.4 of IBM Tivoli Monitoring for Virtual Environments Agent for NetApp Storage (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 NetApp Storage (product code NU) provides you with the capability to monitor NetApp. You can also use the agent to take basic actions with the NetApp.

IBM® Tivoli® Monitoring is the base software for the NetApp Storage agent.

The IBM Tivoli Monitoring for Virtual Environments Agent for NetApp Storage is an agent that provides a configurable log file monitoring capability that uses regular expressions. For compatibility, the agent can consume the configuration information and format strings previously used by the Tivoli Event Console Log File Adapter. These strings allow the agent to filter the log data according to patterns in the format file, and submit only the interesting data to an event consumer. The agent can send data both to a Tivoli Enterprise Monitoring Server or through the Event Integration Facility (EIF) to any EIF receiver, such as the OMNIBus EIF probe.

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" in the Documentation library topic for complete information about IBM Tivoli Monitoring and the Tivoli Enterprise Portal.

Functions of the monitoring agent

Displays health and performance of NetApp and IBM N series storage systems

You can use the NetApp Storage agent to visualize capacity, latency, and throughput performance metrics of NetApp and IBM N series storage systems.

Helps identify poorly performing storage system objects

The NetApp Storage agent collects several important performance metrics for the following NetApp storage objects: hosts (filers), Aggregates, Vservers, Qtrees, Disks, Volumes, and logical unit numbers (LUNs); sorts object lists by performance metrics to show the least healthy or busiest objects at the top; and displays trend graphs of the same performance metrics when it shows an object in detail.

Interoperates with the VMware VI agent

The NetApp Storage agent interoperates with the IBM Tivoli Monitoring for Virtual Environments Agent for VMware VI and provides data sharing and workspace linking between the NetApp Storage agent and the VMware VI agent. The detailed workspaces for NFS data stores in the VMware VI agent can show detailed data about related NetApp volume. Clicking a link from that VMware VI data store workspace takes you to the detailed workspace of the related volume in the NetApp Storage agent.

Helps isolate VM guest performance problems

You can use the NetApp agent to isolate performance problems in their NetApp storage systems, and in cooperation with the VMware VI agent, see how storage system problems might be affecting VM guest performance. Links within the NetApp Storage agent workspaces make it easy to drill up and down in the hierarchy of the NetApp storage system objects to see the status and performance metrics of related objects.

Performs discovery and monitoring with the Active IQ Unified Manager

Each agent instance connects to a single Active IQ Unified Manager. The unified manager discovers the objects in the NetApp storage system. Only one set of user credentials is required to monitor all the objects in the storage system. Additional agent instances can monitor additional unified managers allowing operational monitoring of very large NetApp storage installations from a single Tivoli Enterprise Portal..

New in this release

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For version 7.3.0.4 of the NetApp Storage agent, the following enhancements were made since version 7.3.0.3, including the fix packs if any.

Added support for the following platform and applications:

- Windows Server 2022 Operating System (Datacenter and Standard editions)
- ITM 6.3.0 FP 07 Service Pack 12
- Active IQ Unified Manager version 9.10 and Active IQ Unified Manager version 9.11
- Upgraded JRE version to 1.8.0_321

Components of the IBM Tivoli Monitoring environment

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After you install and set up the NetApp Storage 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, NetApp Storage 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 NetApp is running.

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

However, multiple agents on the same machine should not point to the same NetApp datasource as it increases the network overhead.

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. Within the same dashboard view, you can launch from one application to another and 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.

You can use IBM Tivoli Monitoring Agent Management Services to manage the NetApp Storage 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 NetApp Storage 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*.

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. It is recommended to use Internet Explorer as a web browser.

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.

Data sources

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The NetApp Storage agent collects data from the following sources:

NetApp Manageability SDK and Active IQ REST API

The agent uses application-specific API calls to gather metrics.

SNMP

SNMP (Simple Network Management Protocol) is the network management protocol used almost exclusively in TCP/IP networks. By using SNMP, you can monitor and control network devices, and manage configurations, statistics collection, performance, and security. This agent supports SNMP V1, V2c, and V3.

SNMP Events

SNMP is the network management protocol used almost exclusively in TCP/IP networks. SNMP resources send asynchronous notifications in the form of traps or informs to a manager. This agent receives traps or informs and makes them available in IBM Tivoli Monitoring. This agent supports SNMP V1, V2c, and V3.

WMI

By using WMI (Windows Management Instrumentation), you can monitor and control managed resources throughout the network. Resources include hard drives, file systems, operating system settings, processes, services, shares, registry settings, networking components, event logs, users, and groups. WMI is built into clients with Windows 2000 or later, and can be installed on any 32-bit Windows client.

Perfmon

Use the Windows Performance Monitor, or Perfmon, to view various system and application performance metrics for collection and use by management applications. You typically view system metrics on a Windows system through the 'perfmon' application.

JMX

Use the Java Management Extensions (JMX) interface to gather various metrics from Java applications supporting the monitored resource.

JDBC

Use the Java Database Connectivity (JDBC) interface to gather information from database tables supporting the monitored resource.

Availability

Use the agent to monitor availability of the application and related components in the following ways:

- Monitor the status of the processes.
- Monitor the Windows services used by the application.
- Perform application-specific tests (such as API calls).

Scripts

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

SSH Scripts

The agent uses application-specific commands and interfaces to gather metrics remotely by using an SSH connection to the monitored resource.

Log files

The agent uses the file system to monitor application log files or other data files to gather metrics.

Windows Event Log

The agent collects Windows Event Log entries related to the monitored resource and forwards them to IBM Tivoli Monitoring.

HTTP

Use Hypertext Transfer Protocol (HTTP) to monitor the availability and basic content of URLs supporting the monitored application.

ICMP Ping

Use ICMP packets commonly known as "ping" to monitor systems that support the monitored resource.

CIM

Use Common Information Model (CIM) messages over HTTP to gather data related to the monitored resource.

Chapter 2. Installing and configuring the agent

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 NetApp Storage 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.

To install and configure the NetApp Storage agent, use the *Installing monitoring agents* procedures in the *IBM Tivoli Monitoring Installation and Setup Guide*.

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*.

With the self-describing agent capability, new or updated IBM Tivoli Monitoring agents using IBM Tivoli Monitoring V6.2.3 or later can become operational after installation without a need to do more product support installation steps. To take advantage of this capability, see "Enabling self-describing agent capability at the hub monitoring server" in the *IBM Tivoli Monitoring Installation and Setup Guide*. Also, see "Self-describing monitoring agents" in the *IBM Tivoli Monitoring Administrator's Guide*.

Requirements

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

For the most up-to-date information about system requirements, see the [Software product compatibility reports](http://publib.boulder.ibm.com/infocenter/prodguid/v1r0/clarity/index.html) (<http://publib.boulder.ibm.com/infocenter/prodguid/v1r0/clarity/index.html>). Search for the Tivoli Monitoring for Virtual Environments product.

Installing language packs

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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 installing on Windows systems, installing on UNIX or Linux systems, or installing silently.

Installing language packs on Windows systems

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You can install the language packs on a Windows system.

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

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 `n1spackage` 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. Examine the installation summary page and click **Next** to begin installation.
8. After installation completes, click **Finish** to exit the installer.
9. 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

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

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

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 `n1spackage` 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. Examine the installation summary page and click **Next** to begin installation.
10. After installation completes, click **Finish** to exit the installer.
11. Restart the Tivoli Enterprise Portal, Tivoli Enterprise Portal Server, and Eclipse Help Server if any of these components are installed.

Installing language packs on Windows, UNIX, or Linux systems silently

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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.

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

1. Copy and paste the `ITM_Agent_LP_silent.rsp` response file template as shown in [“Response file example”](#) on page 9.
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:\\zosgmv\\LCD7-3583-01\\nlspackage).
#For UNIX and Linux:
```

```

# Use the slash-slash (//) as a file separator (for example,
#//installtivoli//lpsilenttest//nlspackage).
#-----
#NLS_PACKAGE_FOLDER=C:\\zosgmv\\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:\\zosgmv\\LCD7-3583-01\\nlspackage\\KIP_NLS.nlspkg
#BASE_AGENT_FOUND_PKG_LIST=C:\\zosgmv\\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

```

Installing and configuring: agent-specific

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In addition to the installation and configuration information in the *IBM Tivoli Monitoring Installation and Setup Guide*, use this agent-specific installation and configuration information to install the NetApp Storage agent.

Before you begin installation and configuration

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

1. The NetApp Storage agent requires the NetApp Manageability SDK JAR file to communicate with a NetApp Active IQ Unified Manager. After the NetApp Storage agent is installed, the NetApp Manageability SDK JAR file (manageontap*.jar) must be downloaded from the NetApp website and installed in the monitoring agent lib directory. Download a compressed file containing the JAR file from <https://mysupport.netapp.com/site/products/all/details/netapp-manageability-sdk/downloads-tab>. When this compressed SDK has been downloaded and extracted, copy the JAR available at SDK_Home\lib\java\classes\ manageontap*.jar to the following locations:
 - For 32-bit Windows systems, copy the file to install_dir\tmaitm6.
 - For 64-bit Windows systems, copy the file to install_dir\tmaitm6_x64.
 - For 32-bit Linux systems, copy the file to install_dir/li6263/nu/lib.
 - For 64-bit x86-64 Linux systems, copy the file to install_dir/lx8266/nu/lib.
 - For 64-bit zLinux systems, copy the file to install_dir/ls3266/nu/lib.
2. Create a local user with minimum role as Operator to have access to agent for monitoring of Active IQ Unified Manager.
3. To monitor the performance counters, you must have Active IQ Unified Manager REST API which gets automatically setup during the installation of Active IQ Unified Manager. To confirm if it is accessible, try to access the given URL:

```
https://ACTIVE_IQ_UNIFIER_MANAGER_IP/docs/api/
```

Note: The ONTAP Storage System Manager until version 5.x is referred to as Data Fabric Manager (DFM). Version 6.x to 9.5 onwards, it is referred to as OnCommand Unified Manager and version 9.6 onwards, it is renamed as Active IQ Unified Manager.

Selecting an installation location

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You can install the NetApp Storage agent on the same system as the Active IQ Unified Manager or on a remote system that is reachable and in same network of unified manager.

If you have multiple UMs, assign monitoring agents that monitor unified manager to a single server dedicated to monitoring NetApp. Because monitoring is done remotely, and you need to choose a server that is in proximity to your Storage environment to ensure the higher availability for your data collection.

Local installation

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For local installation, you need to install the NetApp application support files that contain agent-specific information.

For more details, read *NetApp Storage application support*.

NetApp Storage application support

[Edit online](#)

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*.

Local configuration

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

The configuration attributes define, which unified manager sources are monitored. You can configure more than one instance of the monitoring agent on a remote monitoring host system. One instance can monitor one setup, Active IQ Unified Manager and Active IQ Unified Manager REST API.

Configuration values

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For both local and remote configuration, you provide the configuration values for the agent to operate.

When you are configuring an agent, a panel is displayed so you can enter each value. When a default value exists, 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 configuration for this agent is organized into the following groups:

Data Provider (DATA_PROVIDER)

The configuration elements defined in this group are always present in the agent's configuration.

This group defines information that applies to the entire agent.

Maximum Number Of Data Provider Log Files (KNU_LOG_FILE_MAX_COUNT)

This is the number of log files that is created before rolling over.

The type is numeric.

This value is required.

Default value: 10

Maximum Size in KB of Each Data Provider Log (KNU_LOG_FILE_MAX_SIZE)

This value is the maximum size in kilobytes that a log file reaches before moving to the next log file.

The type is numeric.

This value is required.

Default value: 5190

Level of Detail in Data Provider Log. (KNU_LOG_LEVEL)

This value is the maximum size in kilobytes that a log file reaches before moving to the next log file.

The type is one of the following values: "Off", "Severe", "Warning", "Info", "Fine", "Finer", "Finest", "All".

This value is required.

Default value: INFO

Active IQ Unified Manager (DATASOURCE)

The configuration elements defined in this group are always present in the agent's configuration.

This group defines information that applies to the entire agent.

Server (KNU_DATASOURCE_HOST_ADDRESS)

The host name or IP address of the monitored NetApp server.

The type is string.

This value is required.

Default value: None

Password (KNU_DATASOURCE_PASSWORD)

The password for the above user name.

The type is password.

This value is required.

Default value: None

Protocol (KNU_DATASOURCE_PROTOCOL)

The password for the above user name.

The type is one of the following values: "HTTP", "HTTPS".

This value is required.

Default value: HTTPS

User (KNU_DATASOURCE_USERNAME)

A user name on the NetApp server that has sufficient privileges to collect monitoring data.

The type is string.

This value is required.

Default value: None

Remote installation and configuration

[Edit online](#)

You can install the monitoring agent remotely from the Tivoli Enterprise Portal or from the command line.

When you install the agent remotely, you must provide the configuration values for the agent to operate. See “[Configuration values](#)” on page 11.

To install from the portal, see the *IBM Tivoli Monitoring Installation and Setup Guide*.

To remotely install or configure an agent through the Tivoli Enterprise Portal, application support for that agent must be installed (Tivoli Enterprise Monitoring Server, Tivoli Enterprise Portal Server, and Tivoli Enterprise Portal). Also, the agent bundle must be installed in the Remote Deploy Depot.

For information about displaying the configuration options that are available to use with the **configureSystem** command, see "tacmd describeSystemType" in the *IBM Tivoli Monitoring Command Reference*.

If you are using the command line, the following commands are examples of remote installation and configuration for Windows operating systems:

Remote installation

```
tacmd addSystem -t NU -n Primary:sample.node.name:NT
APISERVICE.KNU_API_SERVICES_HOST_ADDRESS=value
APISERVICE.KNU_API_SERVICES_PASSWORD=value
APISERVICE.KNU_API_SERVICES_PORT=value
APISERVICE.KNU_API_SERVICES_USERNAME=value
DATASOURCE.KNU_DATASOURCE_HOST_ADDRESS=value
DATASOURCE.KNU_DATASOURCE_PASSWORD=value
DATASOURCE.KNU_DATASOURCE_PROTOCOL=value
DATASOURCE.KNU_DATASOURCE_USERNAME=value
DATA_PROVIDER.KNU_LOG_FILE_MAX_COUNT=value
DATA_PROVIDER.KNU_LOG_FILE_MAX_SIZE=value
DATA_PROVIDER.KNU_LOG_LEVEL=value
INSTANCE="inst1"
```

Remote configuration

The following example illustrates configuration by using all configuration variables. Typically, you specify only the variables and values that you want to change.

```
tacmd configureSystem -m instance.name:hostname:NU
-p APISERVICE.KNU_API_SERVICES_HOST_ADDRESS=value
APISERVICE.KNU_API_SERVICES_PASSWORD=value
APISERVICE.KNU_API_SERVICES_PORT=value
APISERVICE.KNU_API_SERVICES_USERNAME=value
DATASOURCE.KNU_DATASOURCE_HOST_ADDRESS=value
DATASOURCE.KNU_DATASOURCE_PASSWORD=value
DATASOURCE.KNU_DATASOURCE_PROTOCOL=value
DATASOURCE.KNU_DATASOURCE_USERNAME=value
DATA_PROVIDER.KNU_LOG_FILE_MAX_COUNT=value
DATA_PROVIDER.KNU_LOG_FILE_MAX_SIZE=value
DATA_PROVIDER.KNU_LOG_LEVEL=value
INSTANCE="inst1"
```

```
tacmd configureSystem hostname:NU
-p APISERVICE.KNU_API_SERVICES_HOST_ADDRESS=value
APISERVICE.KNU_API_SERVICES_PASSWORD=value
APISERVICE.KNU_API_SERVICES_PORT=value
APISERVICE.KNU_API_SERVICES_USERNAME=value
DATASOURCE.KNU_DATASOURCE_HOST_ADDRESS=value
DATASOURCE.KNU_DATASOURCE_PASSWORD=value
DATASOURCE.KNU_DATASOURCE_PROTOCOL=value
DATASOURCE.KNU_DATASOURCE_USERNAME=value
DATA_PROVIDER.KNU_LOG_FILE_MAX_COUNT=value
DATA_PROVIDER.KNU_LOG_FILE_MAX_SIZE=value
DATA_PROVIDER.KNU_LOG_LEVEL=value
```

Increasing the Java heap size

[Edit online](#)

After you configure the NetApp Storage agent, if you are monitoring a large Storage environment, then you might need to increase the heap size for the Java™ data provider.

The default heap size for the Java data provider is 256 megabytes. In large Storage environments, if the following problems arise, then you might need to increase the heap size:

- The Java data provider stops because of a javacore problem, and creates a file that is named `javacore.date.time.number.txt` in the `CANDLEHOME\tmaitm6_x64` directory.
- The `javacore.date.time.number.txt` file contains the string `java/lang/OutOfMemoryError`.

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_x64\knu_data_provider.bat`.
2. Add the following line before the line that starts with SET
`KNU_JVM_ARGS="$KNU_CUSTOM_JVM_ARGS...`:

```
SET KNU_CUSTOM_JVM_ARGS=-Xmx512m
```

3. Restart the agent.

- On a Linux system:

1. Open the file `$CANDLEHOME/platform/vm/bin/knu_data_provider.sh`.
2. Add the following line before the line that starts with
`KNU_JVM_ARGS="$KNU_CUSTOM_JVM_ARGS...`:

```
KNU_CUSTOM_JVM_ARGS=-Xmx512m
```

3. Restart the agent.

Configuring environment variables

[Edit online](#)

Refer this topic to configure environment variables.

To change the `DATAPROVIDER CONNECTION RETRY COUNT`, follow these steps:

1. Stop all the agent instances.
2. Follow the procedure given in this step for Windows and Unix platforms:
 - a) On Windows platforms, locate the agent instance file `KNUENV_<instance_name>` in the given paths:
 - 32-bit agent system: `%CANDLEHOME%\TMAITM6`
 - 64-bit agent system: `%CANDLEHOME%\TMAITM6_x64`
 - b) On Unix platforms, locate the agent instance file `nu.ini` in the given paths:
 - 32-bit Agent system: `$CANDLEHOME/config`
 - 64-bit Agent system: `$CANDLEHOME/config`
3. Set the required environment variable with desired value in the agent instance file located in Step 2
For example, `KNU_DATA_PROVIDER_CONNECTION_RETRY_COUNT=6`
4. Start the agent instances.

Appendix A. Documentation library

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

IBM Knowledge Center contains topics of information for the product and links to relevant PDFs.

Prerequisite documentation

[Edit online](#)

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

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

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

Related documentation

[Edit online](#)

The documentation for related products provides useful information.

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

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

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

Tivoli Monitoring Community on Service Management Connect

[Edit online](#)

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

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

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

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

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

Other sources of documentation

[Edit online](#)

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

See the following sources of technical documentation about monitoring products:

- [IBM Integrated Service Management Library](http://www.ibm.com/software/brandcatalog/ismlibrary/) (<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/) (<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) (<http://www.ibm.com/support/entry/portal/software>), which are found through the IBM Software Support website, provide the latest information about known product limitations and workarounds.

Conventions used in the documentation

[Edit online](#)

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

Typeface conventions

The following typeface conventions are used in the documentation:

Bold

- Lowercase commands, mixed-case commands, parameters, and environment variables that are otherwise difficult to distinguish from the surrounding text

- Interface controls (check boxes, push buttons, radio buttons, spin buttons, fields, folders, icons, list boxes, items inside list boxes, multicolumn lists, containers, menu choices, menu names, tabs, property sheets), labels (such as **Tip:**)
- Keywords and parameters in text

Italic

- Citations (examples: titles of publications, CDs, and DVDs)
- Words and phrases defined in text (example: a nonswitched line is called a *point-to-point line*)
- Emphasis of words and letters (example: The LUN address must start with the letter *L*.)
- New terms in text, except in a definition list (example: a *view* is a frame in a workspace that contains data.)
- Variables and values you must provide (example: where *myname* represents...)

Monospace

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

Bold monospace

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

Operating system-dependent variables and paths

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

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

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

For environment variables, follow these guidelines:

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

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

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