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HiCommand® Tuning Manager Installation Guide

MK-96HC141-00

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Document Revision Level

Revision	Date	Description
MK-96HC141-00	December 2006	Initial Release

Preface

This document describes and provides instructions for installing and setting up the HiCommand® Tuning Manager software on a server.

This document is intended for users who:

- Have a basic knowledge of SANs (Storage Area Networks)
- Have a background in data processing and understand peripheral storage device subsystems and their basic functions
- Understand the contents of the user manuals for the storage subsystems (e.g., *Lightning 9900V Series User and Reference Guide*)
- Understand the contents of the LUN Management user manuals for the subsystem (e.g., *Thunder 9500V Series LUN Management User's Guide*)
- Understand the contents of the TrueCopy user manual for the subsystem (e.g., *TagmaStore® Universal Storage Platform TrueCopy User and Reference Guide*)

Note: The use of the HiCommand Tuning Manager and all other Hitachi Data Systems® products is governed by the terms of your agreement(s) with Hitachi Data Systems.

Software Version

This document revision applies to HiCommand Tuning Manager version 5.5.

Conventions for Storage Capacity Values

Storage capacity values displayed by HiCommand Tuning Manager are calculated based on the following values:

1 KB (kilobyte) = 1,024 bytes
1 MB (megabyte) = $1,024^2$ bytes
1 GB (gigabyte) = $1,024^3$ bytes
1 TB (terabyte) = $1,024^4$ bytes

Referenced Documents

- *HiCommand Tuning Manager Agent Administration Guide*, MK-92HC013
- *HiCommand Tuning Manager Server Administration Guide*, MK-92HC021
- *HiCommand Tuning Manager User's Guide*, MK-92HC022
- *HiCommand Tuning Manager Hardware Reports Reference*, MK-95HC111
- *HiCommand Tuning Manager Operating System Reports Reference*, MK-95HC112
- *HiCommand Tuning Manager Application Reports Reference*, MK-95HC113

- *HiCommand Tuning Manager Messages Reference*, MK-95HC114
- *HiCommand Tuning Manager Command Line Interface Guide*, MK-96HC119

Readme and Release Notes Contents

These files can be found on the installation CD. They contain requirements and notes for use of HiCommand Tuning Manager that may not be fully described in the manual. Be sure to review these files before installing HiCommand Tuning Manager.

Comments

Please send us your comments on this document. Make sure to include the document title, number, and revision. Refer to specific section(s) and paragraph(s) whenever possible.

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Chapter 1 Overview

This chapter provides an overview of the Tuning Manager series program installation.

- Introducing the Tuning Manager Series Programs (see section 1.1)
- Document References (see section 1.2)
- Reviewing the Installation Procedures (see section 1.3)

1.1 Introducing the Tuning Manager Series Programs

This section describes the programs that comprise the Tuning Manager series.

Tuning Manager (see *Note*)

- Collection Manager

  Collection Manager manages Agent services distributed over the network and controls the alarm events issued by Agents.

- Main Console

  Main Console creates a report in a predefined format for the user-specified period from the metrics data and other data stored in a database.

- Performance Reporter

  Performance Reporter collects data such as performance data and capacity information from the Store database of Agents and creates reports. The user can define the report format.

Note: Tuning Manager includes HiCommand Suite Common Component, which can be used for all HiCommand Suite products.

Agent

- Agent for RAID

  Agent for RAID collects information such as performance data for storage subsystems.

- HTM Agent

  HTM Agent is an abbreviation of the program named HiCommand Tuning Manager – Agent. Agent for RAID Map, Agent for Platform, and Agent for Microsoft® Exchange Server are included in HTM Agent.

  - Agent for RAID Map

    Agent for RAID Map maps servers to storages and collects configuration information of host file systems and the associated storage subsystems. A system managed by Tuning Manager requires at least one instance of Agent for RAID Map.

  - Agent for Platform (Windows®, UNIX®)

    Agent for Platform collects data on OS activities and server performance.

  - Agent for Microsoft Exchange Server (for Windows only)

    Agent for Microsoft Exchange Server collects performance data for Microsoft Exchange Server.

- Agent for SAN Switch

  Agent for SAN Switch collects information such as switch performance data.

- Agent for Network Attached Storage (hereafter referred to as **Agent for NAS**)

  Agent for NAS collects information such as metrics data for the NAS system.

- Agent for Oracle®

Agent for Oracle collects information such as Oracle database performance data.

- Agent for Microsoft SQL Server

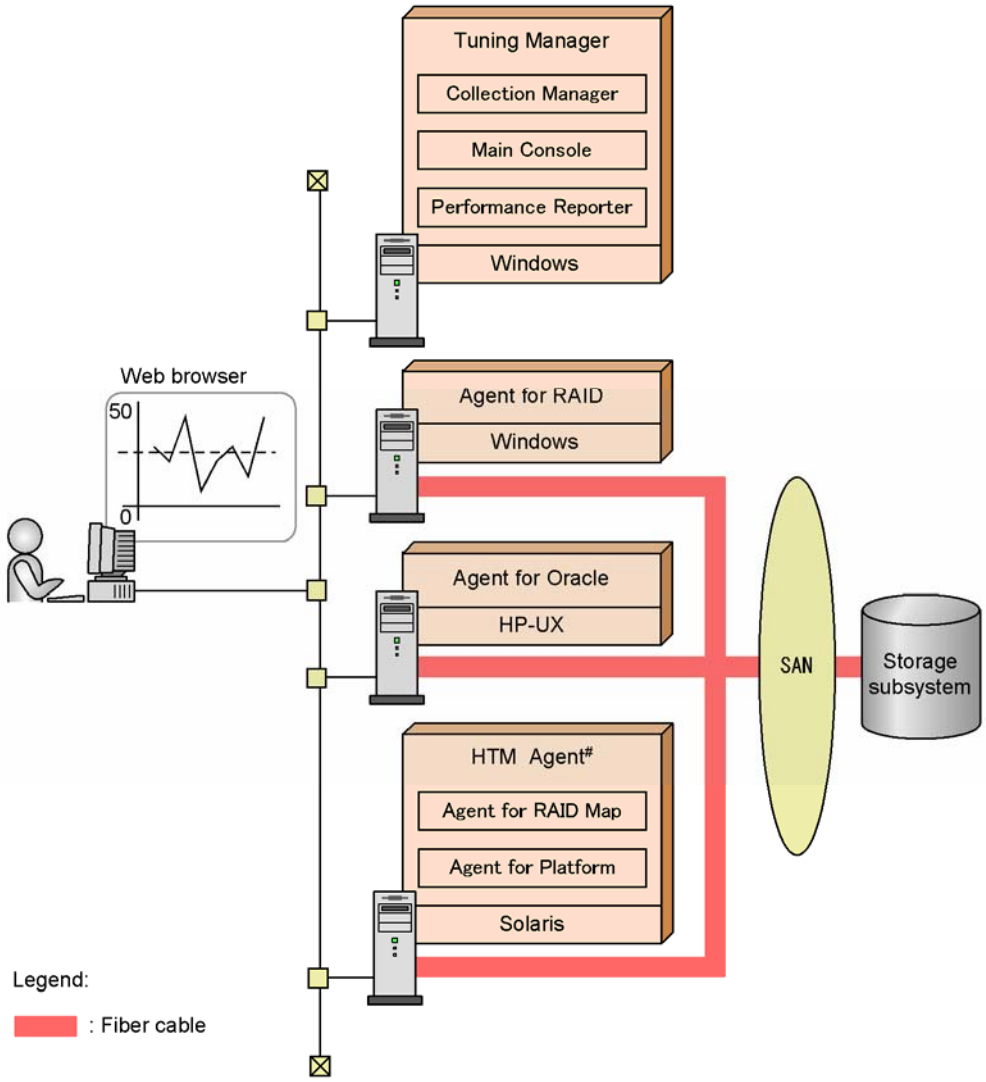
  Agent for Microsoft SQL Server collects information such as Microsoft SQL Server performance data.

- Agent for DB2®

  Agent for DB2 collects information such as DB2 database performance data.

Tuning Manager series programs can operate in a cluster configuration. For details about the setup for using Tuning Manager in a cluster configuration, see section 3.3. For details on how to set up Agent in a cluster configuration, see Chapter 7.

Tuning Manager or Agent can operate on a host that has multiple LAN boards and is connected to multiple LANs. For details about the settings for operation in this configuration, see section 6.5.



#: If you install HTM Agent, Agent for RAID Map and Agent for Platform are also installed.

Figure 1.1 System Configuration Example for Tuning Manager Series

Note: This is one example of a possible configuration. For details about how to use Tuning Manager, see the *HiCommand Tuning Manager User's Guide*.

1.2 Document References

The following outlines the document references for installing and setting up the Tuning Manager series programs:

- For details about the following system requirements, see Appendix A:
  - Applicable operating systems (see Appendix A.1)
  - Monitoring targets (see Appendix A.2)
  - Prerequisite software (see Appendix A.3)
  - Prerequisite software for specific functions (see Appendix A.4)
  - Required patches (see Appendix A.5)
  - Estimating memory requirements (see Appendix A.6)
  - Estimating disk space requirements (see Appendix A.7)
  - Estimating disk space requirements when running in a cluster system (see Appendix A.8)
- For details about the setting values for kernel parameters that must be checked during the installation of Tuning Manager and Agent for Oracle, see Appendix F.
- For details about the storage locations and return values of commands for the Tuning Manager series programs (that is, commands used during installation and setup), see the *HiCommand Tuning Manager Command Line Interface Guide*.
- For details about installation and setup of the programs for collecting and viewing performance data, see sections 3.1.4 and 3.2.4 and the *HiCommand Tuning Manager User's Guide*.
- For details on how to start and stop Tuning Manager and Agent services, see the *HiCommand Tuning Manager Server Administration Guide* and the *HiCommand Tuning Manager Agent Administration Guide*.

1.3 Reviewing the Installation Procedures

This section gives an overview of an installation and an upgrade of the Tuning Manager series programs. This section also describes the login mode provided by Tuning Manager.

1.3.1 Reviewing the Initial Installation Procedures

Before you start installation of Tuning Manager series programs, review the installation procedure. Figure 1.2 presents a conceptual overview of the installation procedure.

Installing Tuning Manager series programs involves these major steps:

1. Installing Tuning Manager and entering your license key. See Chapter 3 for information on initial, upgrade, and repair installation procedures. For details about license keys, see the *HiCommand Tuning Manager Server Administration Guide*.
2. Installing Agents on computers that are hosting the resources you want Tuning Manager to monitor. For details on how to install and configure Agents, see Chapter 4, Chapter 5, Chapter 6 and Chapter 7.
3. (Optional) Configuring Tuning Manager to operate in single sign-on (SSO) mode.

   For details about the SSO mode, see the *HiCommand Tuning Manager Server Administration Guide*.
4. (Optional) Configuring Tuning Manager and Agents to operate in a cluster system.

   For details on how to configure Tuning Manager in a cluster system, see section 2.2. For details on how to configure Agent in a cluster system, see Chapter 7.

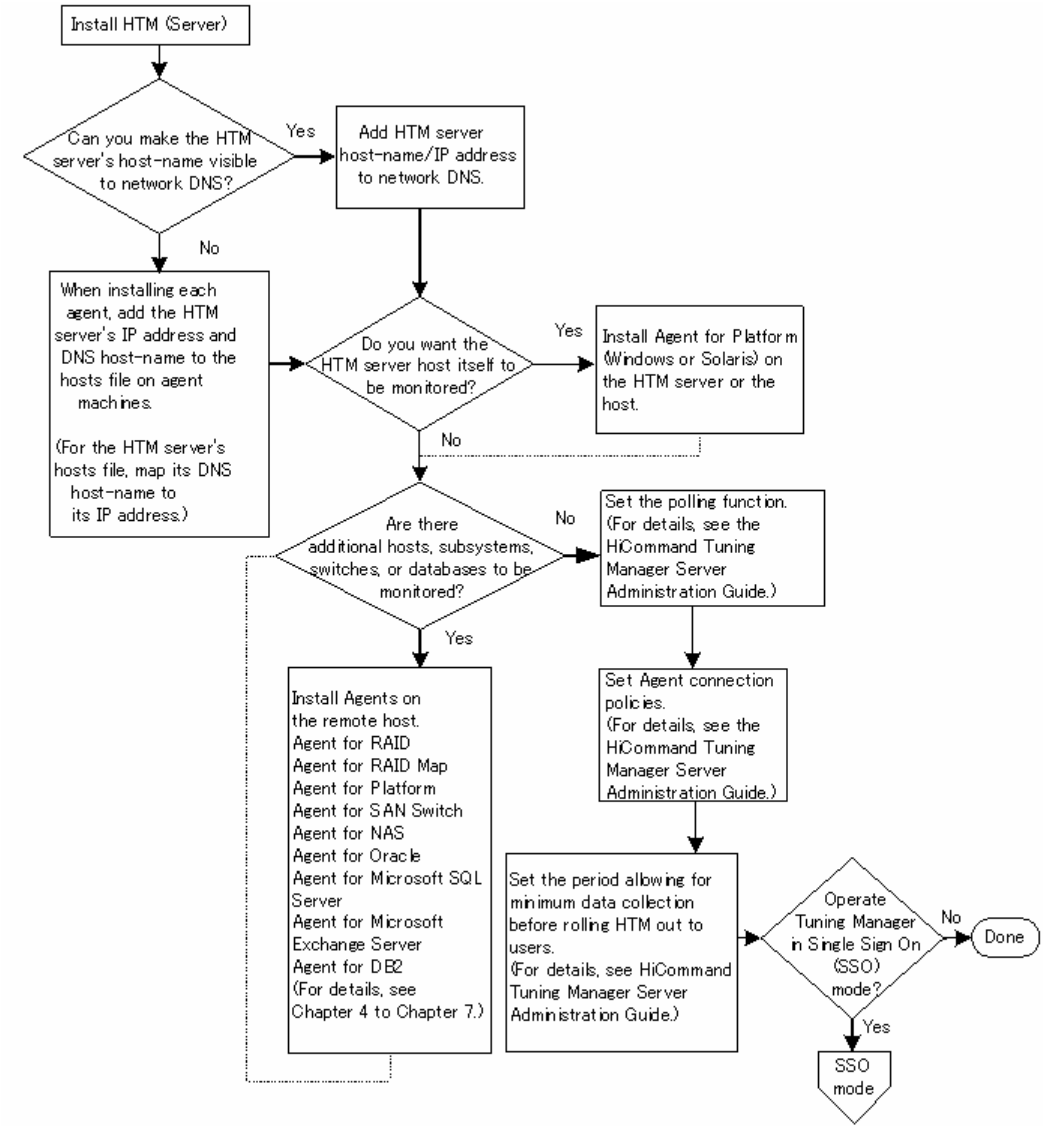


Figure 1.2 Conceptual Overview of Installation Steps and Initial Setup

Note: To run Device Manager through SSO on a remote host, you must be running Device Manager version 3.0 or later.

1.3.2 Reviewing the Upgrade Procedures

The upgrade procedure for Tuning Manager differs from the initial installation procedure. Figure 1.3 presents a conceptual overview of the upgrade procedure. The upgrade procedure for an Agent is basically the same as the Agent's initial installation procedure. This chapter contains preconditions and notices to ensure a successful upgrade of Tuning Manager. For details about what you must review before starting an upgrade, see Chapter 2.

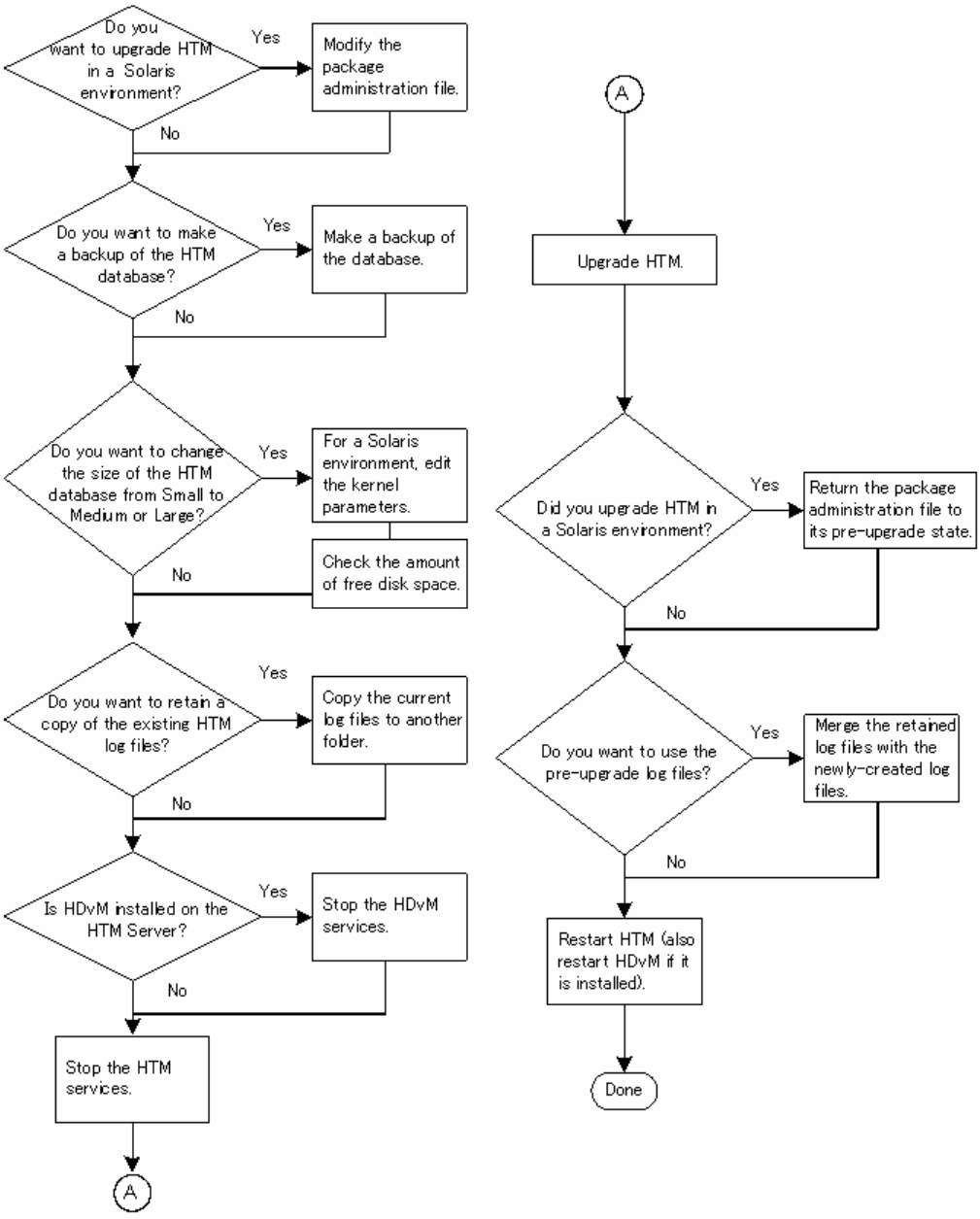


Figure 1.3 Conceptual Overview of the Upgrade Installation Process

1.3.3 Reviewing the Login Modes

Tuning Manager provides two login modes:

- **Standalone mode**: The default login mode provided by Tuning Manager. User accounts are managed directly by Tuning Manager.
- **Single sign-on (SSO) mode**: In SSO mode, user authentication is performed by sharing the user accounts registered in the Device Manager database. You can use the same user account for multiple HiCommand Suite products including Tuning Manager. SSO mode requires Device Manager version 3.0 or later.

  Before you can use SSO mode, HiCommand Device Manager must already be installed, either on the Tuning Manager server or another server on the network. After installing Tuning Manager, log in to the Tuning Manager server by using the Admin permission, and then set the URL for starting the Device Manager server.

  To change the operation to SSO mode after an installation or upgrade of Tuning Manager, see the *HiCommand Tuning Manager Server Administration Guide*.

Note: To view the current login mode for Tuning Manager, click **About** in **Help** in the Global Menu provided by the Tuning Manager GUI. For details about login modes, see the *HiCommand Tuning Manager Server Administration Guide*.

The following table outlines the associations between the installation status and the login modes.

Table 1.1 Installation Status and Login Modes

Installation Status	Login Mode Information
Repair installation	Before an installation of Tuning Manager version 5.5 is repaired, if the SSO mode was used for operation, the corresponding user authentication and user account of the SSO mode are kept even after the repair is completed.
▪ Initial installation ▪ upgrade installation	For initial and upgrade installations, the login mode is set to the standalone mode. In standalone mode, user authentication is performed by a user account registered in the local database of the Tuning Manager server. In this case, the user account can log in only to the Tuning Manager server.

Chapter 2 Preparing to Install or Upgrade Tuning Manager

This chapter describes how to migrate a database from InterBase® to HiRDB and how to set up Tuning Manager in a cluster system. This chapter also describes the procedure and precautions for installing Tuning Manager.

- Reviewing Database Migration Path Options (see section 2.1)
- Overview of Cluster Environment Settings (see section 2.2)
- Reviewing the Installation Notes (see section 2.3)

2.1 Reviewing Database Migration Path Options

Database migration from InterBase to HiRDB can be performed during or after Tuning Manager installation. When a database is migrated after Tuning Manager installation, the database migration command (`htm-db-convert`) is used. If you want to complete the installation as soon as possible, install Tuning Manager without migrating the database, and then use the `htm-db-convert` command to migrate the database from InterBase to HiRDB.

For details about how to migrate a database by using the `htm-db-convert` command, see the *HiCommand Tuning Manager Server Administration Guide*.

2.1.1 Restoring the Database After a Migration Error

To perform restoration when an error occurs in InterBase while a database is being migrated from InterBase to HiRDB:

1. Determine the cause of the error and resolve the problem.
2. Uninstall Tuning Manager version 4.0 or later, as well as InterBase.

   For details on uninstallation, see Chapter 8.
3. Install the version of Tuning Manager version 3.5 or earlier that existed before the database was migrated.

   For details on installation, see the *HiCommand Tuning Manager Installation Guide* for Tuning Manager version 3.5 and earlier.
4. Using the database backup data that was stored before the database migration, restore the InterBase data.

   For details on how to restore InterBase data, see the *HiCommand Tuning Manager Administration Guide* for Tuning Manager version 3.5 or earlier.
5. Upgrade the version of Tuning Manager to version 4.0 or later.

2.2 Overview of Cluster Environment Settings

This section explains the environment settings required when running Tuning Manager in a cluster configuration.

Notes:

- To operate Tuning Manager in a cluster configuration, install Tuning Manager on all hosts to be operated in a cluster configuration. However, you cannot specify cluster configuration settings while installing Tuning Manager. Specify cluster configuration settings after the installation.
- To upgrade Tuning Manager in a cluster configuration, perform an upgrade installation for Tuning Manager in a non-cluster configuration, and then change the system to a cluster configuration.
- Tuning Manager supports an active/standby cluster configuration only; it does not support an active/active cluster configuration.
- To run Tuning Manager in a cluster configuration, you must also specify cluster configuration settings for other HiCommand products on the same server where Tuning Manager is installed. Likewise, to change other HiCommand products on the same server where Tuning Manager is installed to a cluster configuration, you must specify cluster configuration settings for Tuning Manager as well.
- To run Tuning Manager in a cluster configuration, the installation destination directory for Tuning Manager and HiCommand Suite Common Component must be the same on both the executing node and the standby node. Also, the database file storage destination must be specified on a shared disk, and must be the same on both the executing node and the standby node.

2.2.1 Before Configuring the Cluster System

To use Tuning Manager in a cluster configuration, the following three components must be clustered.

- Collection Manager
- Performance Reporter
- Main Console

2.2.1.1 Supported Cluster Software

Tuning Manager supports the following cluster software:

- Windows:
  - Microsoft Cluster Service

  For details about the procedure used to register Microsoft Cluster Service, see section 3.3.2.
- Solaris™:
  - VERITAS® Cluster Server
  - Sun Microsystems Sun Cluster

  For details about the procedure used to register VERITAS Cluster Server, see section 3.3.4. For details about the procedure used to register Sun Microsystems Sun Cluster, see section 3.3.3.

2.2.1.2 Preparing to Configure a Cluster Environment

Before configuring a cluster environment, you need to back up the database. For details on how to back up the database for Tuning Manager, see the *HiCommand Tuning Manager Server Administration Guide*.

When upgrading the version of Tuning Manager from version 3.5 or earlier to version 4.0 or later, you must migrate the database. If the database was not migrated during installation, migrate the database before configuring a cluster environment. For details on the database migration procedure, see the *HiCommand Tuning Manager Server Administration Guide*.

In addition, make sure that logical host names, logical IP addresses, and shared disks satisfy the requirements as follows:

Logical Host Name

Make sure that all of the following conditions are satisfied:

- Each logical host has a logical host name and a logical IP address associated with the logical host name, and the names and addresses can be transferred from the executing node to the standby node.
- The logical hosts and logical IP addresses have been registered in the `hosts` file and name server.
- If DNS is used, the host names are logical host names that do not include a domain name, that is, they are not FQDNs.
- The physical host names and logical host names are unique within the system.

Notes:

- Do not specify a physical host name (which is displayed by the `hostname` command in Windows or the `uname -n` command in Solaris) as a logical host name. Doing so may hinder normal communication.
- Up to 32 single-byte alphanumeric characters can be used for a logical host name. The following characters and spaces cannot be used:

  `/ \ : ; * ? ' " < > | & = ,`
- You cannot specify `localhost`, an IP address, or a host name beginning with a hyphen (-) as a logical host name.

Logical IP Address

Make sure that all of the following conditions are satisfied:

- Each logical host has a logical host name and a logical IP address associated with the logical host name, and the names and addresses can be transferred from the executing node to the standby node.
- The logical hosts and logical IP addresses have been registered in the `hosts` file and name server.

Shared Disk

Make sure that all of the following conditions are satisfied:

- Each logical host has a shared disk so that the standby node can use the same information as the executing node.
- The shared disk is physically connected to the host using Fibre Channel or SCSI.

  Tuning Manager does not support configurations in which a network drive or a disk replicated through a network is used as a shared disk.
- During a failover, if some processes using a shared disk remain, the shared disk can be forced offline by cluster software (or other means) to secure the failover sequence.

2.3 Reviewing the Installation Notes

This section describes the items that must be prepared and checked before installing Tuning Manager.

2.3.1 Items Required for Both Windows and Solaris Systems

This subsection describes items common to all installation environments.

- Before you start the installation, read the warnings, prerequisites, and notes provided in this subsection and Release Notes.
- Check unused http ports (default port for Tuning Manager: 23015).
- Prepare the installation CD-ROMs for Tuning Manager and Agents.
- Prepare a supported Web browser (necessary for configuring and using Tuning Manager):
  - Internet Explorer V.6 or later
  - Mozilla® 1.4 (Solaris only)

  For details on the required browser settings for using Tuning Manager, see the *HiCommand Tuning Manager User's Guide*.

  For details on the required configuration of Tuning Manager after it is installed, see the *HiCommand Tuning Manager Server Administration Guide*.
- If the installation of Tuning Manager fails, uninstall Tuning Manager. After the uninstallation, remove the cause of the failure, and then install Tuning Manager again.
- If one or more agents of the Tuning Manager series are already installed on the server where you plan to install, upgrade, or repair the Tuning Manager server software, all of the agent services must be stopped in the appropriate order before you install Tuning Manager.

  If the installation program fails to stop these services, see the *HiCommand Tuning Manager Agent Administration Guide* to stop these services manually.
- Stop HiCommand Suite Common Component before installing Tuning Manager. If a HiCommand Suite product other than Tuning Manager is running in the same server and is using HiCommand Suite Common Component, you must stop that HiCommand Suite product and then stop HiCommand Suite Common Component.
- If HiCommand Device Manager is installed on the same server, you must stop all of the HiCommand-related services currently running before installing Tuning Manager. For instructions on stopping the Device Manager services, see the *HiCommand Device Manager Server Installation and Configuration Guide*.
- If a version 4.0 or later HiCommand Suite product is being used, we recommend that you back up the databases for that HiCommand Suite product and HiCommand Suite Common Component before you install Tuning Manager. For details on how to back up the database, see the relevant manual for each installed product.

- When you install Tuning Manager on the server machine for the first time or when you upgrade Tuning Manager, install Server Part 1 in its entirety, and then install Server Part 2. Do not perform this installation in reverse order.

  When you repair Tuning Manager, you can perform an installation starting with either Server Part 1 or Server Part 2. However, you cannot perform a component-based installation.

- If the Single Sign-On (SSO) mode was used before the Tuning Manager installation was repaired, the login mode and user account are carried over once the installation is repaired.

- If you install Tuning Manager on a machine on which Agent is installed, the Tuning Manager which is the connection destination for Agent is renamed to the local host name. Please see the common message log to which the setting result is output.

- When you install and set up multiple Tuning Manager series programs whose versions are version 5.0 or later on a host, the configuration status of the status management function differs as follows:

  – When Tuning Manager series programs whose versions are version 5.1 or later are newly installed on a host on which Tuning Manager series programs have not been installed:

    The configuration status of the status management function will be enabled.

  – In the case other than above:

    The configuration status of the status management function will be kept as the existing status.

  Tuning Manager series programs earlier than version 5.0 do not support the status management function. For Tuning Manager of these versions, the configuration status will become disabled. For details about the procedure used to change the configuration of the status management function, see the *HiCommand Tuning Manager Agent Administration Guide*.

- After installation, set the Performance Reporter environment variables. For details, see the *HiCommand Tuning Manager Server Administration Guide*.

2.3.2 Items Required for a Windows System

- Log in with Admin permission.

  Before beginning the installation, make sure you are logged in with the Admin permission.

- Installation folders

  The default installation folders for Tuning Manager and HiCommand Suite Common Component are as follows:

  For operating systems other than Windows Server 2003 x64:

  Default installation folder of Tuning Manager: *system-drive*`\Program Files\HiCommand\TuningManager\`

  Default installation folder of HiCommand Suite Common Component: *system-drive*`\Program Files\HiCommand\Base\`

For Windows Server 2003 x64:

Default installation folder of Tuning Manager: *system-drive*\Program Files (x86)\HiCommand\TuningManager

Default installation folder of HiCommand Suite Common Component: *system-drive*\Program Files (x86)\HiCommand\Base\

- Unblocking important Windows security warnings

  During installation of Tuning Manager, multiple Windows Security Alert dialog boxes might appear. In this case, click **Unblock** in all of these dialog boxes, and then continue the installation.

- Starting the HiRDB/EmbeddedEdition _HD0 service

  Do not stop the HiRDB/EmbeddedEdition _HD0 service if it has been registered in the service panel. This service must always be running.

2.3.3 Items Required for a Solaris System

- Root login

  You must have root privileges to install HiCommand Tuning Manager. Before beginning the installation, ensure that you are either logged in with the required privileges, or use the su command to become root.

- Installation directory

  Tuning Manager can be installed only in the /opt/HiCommand/TuningManager directory.

- Installation directory attribute

  The attribute of the installation directory might be changed to the directory attribute specified for the product.

- Installation environment

  Do not install Tuning Manager in an environment in which a link has been set up to the installation directory for Tuning Manager.

  Do not install Tuning Manager in an environment in which a link has been set up to the destination for creating the database files.

- Start the Installer

  To start the installer, specify the absolute path.

- About the kernel parameters

  In Solaris, set the values of the kernel parameters before you install Tuning Manager. For details on how to do this, see Appendix F.1.

2.3.4 About the Tuning Manager Host Name

For every machine that hosts a Tuning Manager agent to be monitored by the Tuning Manager server, you must register the host name for the machine on which Tuning Manager is installed. This is a requirement for successful communication between Tuning Manager agents and the Tuning Manager server.

To determine the host name, execute the following command:

- Windows: `hostname`
- UNIX: `uname -n`

Run Tuning Manager server only in an environment where an IP address can be resolved from its own host name. If it cannot be resolved, change the environment settings so that an IP address can be resolved from its own host name.

If the Tuning Manager server's host name is not already accessible to computers that host agents, you must:

- Add an entry in your network's DNS server for the Tuning Manager server host name (recommended method).

  You can map a host name to an IP address to allow the agents to easily connect to the Tuning Manager server. You can also use the DNS server to provide centralized management of the host names and IP addresses.

  or

- Edit the `hosts` file on the agent machine. Editing the `hosts` file only changes local mapping information.

  If you use this method, you must register the host name and IP address of the Tuning Manager server into the `hosts` file on every host on which an agent is installed.

The `hosts` file provides a way for a machine to locally resolve a host name reference into a specific IP address.

Note: If you use the method of editing the `hosts` files, you must edit the `hosts` file on every agent machine.

If the IP address for the Tuning Manager server changes after installing the agent, you must revisit each agent machine and revise each `hosts` file accordingly.

Table 2.1 Location of Hosts File for Supported Agent Operating Systems

Operating system	File name	Full path
Windows	`Hosts`	`C:\`*Windows-installation-directory*`\System32\Drivers\ETC\Hosts`
Solaris	`hosts`	`/etc/hosts`

To make the Tuning Manager server visible by editing the `hosts` file:

1. Use a text editor to open the `hosts` file specified under the Full Path column in Table 2.1.
2. Add the following line after the last entry in the `hosts` file, and terminate the newly-added line with a return:

```
IP-address HTM-host-name #comment describing the entry
```

   The format for `hosts` entries is:

   - Tuning Manager server IP address (*IP-address*).
   - At least one separation character (blank space or tab).
   - Host name to be associated with the IP address (*HTM-host-name*).
   - At least one separation character (blank space or tab).
   - (Optional) A comment string preceded by a hash mark (#), as shown above.
   - Line feed character

   For example, the following entry adds the IP address 192.168.0.1 with the host name HTMServer to the `hosts` file:

```
192.168.0.1   HTMServer   #IP address for TuningManager host machine
```

3. Save the edited `hosts` file, and exit the text editor.

Note: If the IP address for the Tuning Manager server changes, you must revisit each agent machine and revise each `hosts` file accordingly.

2.3.5 Preparing for an Initial Installation

This section describes the items that must be prepared and checked before the initial installation of Tuning Manager.

About installing Device Manager and Tuning Manager on the same machine

- If you are installing Device Manager version 3.5 or earlier and Tuning Manager version 4.0 or later on the same machine, install Device Manager first.
- If you are installing Device Manager version 4.0 or later and Tuning Manager version 3.5 or earlier on the same host, you must install Tuning Manager first. If you install Device Manager first, and then try to perform a database migration during a Tuning Manager upgrade installation, the migration will fail. Even if you do not perform a database migration during a Tuning Manager upgrade installation, later attempts to execute the `htm-db-convert` command will fail, and database migration will not be possible.

  Thus, before performing an upgrade installation in an environment where Device Manager version 4.0 or later is installed prior to Tuning Manager version 3.5 or earlier, you need to back up their databases and then uninstall both Tuning Manager and Device Manager. After that, reinstall Tuning Manager Version 3.5 or earlier and then Device Manager Version 4.0 or later, and then restore their databases.

About installing HiRDB-related products

- Do not install the Tuning Manager server in a system in which the client environment definitions of HiRDB related products (such as HiRDB/Single Server, HiRDB/Parallel Server, HiRDB/Run Time, HiRDB/Developer's Kit, and HiRDB/Workgroup Server) are set in environment variables. If you install Tuning Manager server on such a system, Tuning Manager version 5.5 installation or startup might fail.
- HiCommand Tuning Manager cannot be used with the following HiRDB products. Therefore, do not install HiCommand Tuning Manager on a machine on which these HiRDB products are installed. Likewise, do not install these HiRDB products on a machine on which HiCommand Tuning Manager is installed.

  HiRDB/Single Server

  HiRDB/Parallel Server

  HiRDB/Workgroup Server

  HiRDB/Run Time

  HiRDB/Developer's Kit

  HiRDB SQL Executer

About the database size

When you select **Large** for the size of the database used by Tuning Manager, you must set up the environment on a dedicated Tuning Manager server because Tuning Manager will use a large amount of memory. Do not install Tuning Manager on a server that already contains another HiCommand Suite product. For details about the database size, see Appendix D.

About the temporary work directory during installation

- When installing Tuning Manager, 40 MB of free disk space is required in the '/' (root) directory, which is used as the temporary work directory.
- The following temporary work directory is used for installation. When the installation has successfully completed, the installer deletes this work directory.

  Work directory: /opt/jp1pc_V8
- If the installation fails (for example, because disk space is insufficient), the installer cannot delete the temporary work directory. If the installation fails, please delete the work directory, check the system status, and then try the installation again.

About the port number registered during installation

When Tuning Manager is installed, a port number used by Tuning Manager is registered at the end of the services file. A blank line might be included, but this does not affect operations.

2.3.6 Preparing for an Upgrade Installation

Keep the following in mind before upgrading Tuning Manager:

Backing up InterBase

For details about InterBase backup, see the *HiCommand Tuning Manager Server Administration Guide*.

Upgrade installation directory

The upgrade software for Tuning Manager version 5.5 is installed in the same directory in which the previous version was installed.

User Accounts

- For the default login mode, Tuning Manager version 5.5 incorporates user accounts for versions of Tuning Manager earlier than version 5.5. These user accounts only take effect when HiCommand Tuning Manager is used in standalone mode (user information carried over during upgrades includes bookmarks and saved reports).
- When Tuning Manager is used in standalone mode, all user names carried over from previous versions of Tuning Manager to Tuning Manager version 5.5 are handled as lower case.
- Tuning Manager provides single sign-on user authentication (SSO mode) for sites running multiple HiCommand Suite products. The SSO mode allows you to set up common user accounts to use for accessing all installed HiCommand applications.
- When you run Tuning Manager in SSO mode, you cannot use a user account for standalone mode. Use a user account managed by Device Manager instead. Before accessing Tuning Manager, add user accounts common to all HiCommand applications from Device Manager. For details about adding new user accounts, see the *HiCommand Device Manager Web Client User's Guide*.

Critical: Standalone mode is automatically used as the login mode when the following versions of Tuning Manager are upgraded to Tuning Manager version 5.5:

- Tuning Manager 1.1
- Tuning Manager 3.0
- Tuning Manager 3.1
- Tuning Manager 3.2

If you were running Tuning Manager in SSO mode before the upgrade installation, user accounts common to the HiCommand Suite products are retained.

If you want to use Tuning Manager in SSO mode, see the *HiCommand Tuning Manager Server Administration Guide*.

Note: Before performing an upgrade installation, delete any unnecessary user accounts.

Retaining Tuning Manager Log Entries

The Tuning Manager installer will not retain log entries from previous versions. These are your options if you want to include a previous version's log activity after upgrading:

- Archive legacy Tuning Manager log entries by copying the log files to another location.
- Merge the older Tuning Manager log file to the new Tuning Manager log file.

To merge your previous Tuning Manager version's log file with the new Tuning Manager log file:

1. Copy your current Tuning Manager log file to another location before installing the Tuning Manager upgrade.
2. Upgrade to Tuning Manager version 5.5.
3. Stop the Tuning Manager services. For details, see the *HiCommand Tuning Manager Server Administration Guide*.
4. Use a text editor or operating system `copy` command to merge the old and new Tuning Manager log files.
5. Re-start Tuning Manager.

Note: For details about log files, see the *HiCommand Tuning Manager Server Administration Guide*.

Dealing with errors that occur during an upgrade installation in a Windows system

If you perform an upgrade installation after all of the services for Tuning Manager have stopped, installation might fail with the following error message displayed:

```
An error [-5009: 0x8002802b] has occurred while running the setup.
Please make sure you have finished any previous setup and closed other applications. If the
error still occurs, please contact your vendor.
```

If this error occurs, delete the following folders and files, and then install the software again.

- Subfolders and files under *Windows-installation-drive*\Program Files\Common Files\InstallShield\engine
- Subfolders and files under *Windows-installation-drive*\Program Files\Common Files\InstallShield\Professional\RunTime
- Subfolders and files under *Windows-installation-drive*\Program Files\Common Files\InstallShield\Driver

Changing the package administration files in a Solaris system

When Tuning Manager is installed, Collection Manager and HiCommand Suite Common Component are updated. Therefore, you must edit the package administration files on the server before performing an upgrade installation.

To edit the package administration files:

1. Log in to the host as root or use the `su` command to obtain root privileges in your current login session.
2. Locate the package administration file (`default`) in the following directory:

   ```
   /var/sadm/install/admin/.
   ```

   Note: If the package administration file is not in this location, the upgrade installer will display an error message:

   ```
   System package admin file not found, will be unable to upgrade any HiCommand components.
   ```

3. Make sure that the file mode is read/write for the root user.
4. Use the `vi` command as shown below to start the text editor and open the package administration file.

   ```
   vi /var/sadm/install/admin/default
   ```

5. Locate the following line:

   ```
   instance=unique
   ```

6. Change the line to the following:

   ```
   instance=rewrite
   ```

7. Save the changes, and then exit the text editor.
8. Perform the upgrade installation.

   Tuning Manager version 5.5 can now be installed. For details on the installation, see section 3.2.3.

9. After the installation is complete, reload the package administration file in a text editor.
10. Change the value for `instance` back to its original value, as follows:

    ```
    instance=unique
    ```

11. Save the changes, and then exit the text editor.

Chapter 3 Installing or Upgrading Tuning Manager

This chapter describes how to install Tuning Manager and how to set up Tuning Manager in a cluster system.

- Installing on a Windows Host (see section 3.1)
- Installing on a Solaris Host (see section 3.2)
- Operation in a Cluster System (see section 3.3)

3.1 Installing on a Windows Host

This section describes how to install Tuning Manager in a Windows environment. For details about the items that need to be checked before the installation, see Chapter 2.

3.1.1 Initial Installation on a Windows Host

To install Tuning Manager:

1. Insert the installation CD into your CD-ROM drive.
2. Display the contents of the installation CD (for example, by using Windows Explorer) and double-click the `setup.exe` file in the `\ServerPart1` folder.
3. When the startup panel for Server Part 1 installation appears (see Figure 3.1), click **Next**.
4. A panel appears, recommending that you back up the databases for the HiCommand Suite Common Component and HiCommand Suite products (see Figure 3.2). If version 4.0 or later of a HiCommand product has not been installed, or if the backup has already been created, click **Next**.
5. Enter your user and company name in the required text fields displayed on the Customer Information panel (see Figure 3.3), and click **Next**.
6. When the **Choose Destination Location** panel appears (see Figure 3.4), select the default path entry chosen by the installer or choose a different location, then click **Next**.

   Note: The following characters can be used in a folder name: `A-Z`, `a-z`, `0-9`, periods (`.`), underscores (_), and space characters.
7. The **Start Copying Files** panel displays and allows you to confirm the entries you made (see Figure 3.5). If you need to change one or more entries, click **Back** and repeat steps 5 and/or 6 as needed. When the entries are correct, click **Next** to start the Server Part 1 installation.

   The Setup Status panel displays the progress of the installation.
8. When the installation of Server Part 1 finishes, a completion panel is displayed (see Figure 3.6). To complete the installation of Server Part 1, click **Finish**. Proceed with the installation of Server Part 2.

   *Note***:** You do not need to restart your computer after the installation of Server Part 1.
9. Display the contents of the installation CD (for example, by using Windows Explorer), and double-click the `setup.exe` file in the `\ServerPart2` folder.
10. When the startup panel for Server Part 2 installation appears (see Figure 3.7), click **Next**.
11. A panel appears, recommending that you back up the databases for the HiCommand Suite Common Component and HiCommand Suite products (see Figure 3.8). If no version 4.0 or later HiCommand Suite product has been installed or if the backup has already been created, click **Next**.

12. If Tuning Manager is the only installed HiCommand Suite product that uses HiCommand Suite Common Component, a panel appears for selecting the destination for installing HiCommand Suite Common Component (see Figure 3.9). Select the default destination folder or choose a different destination folder for creating the files, then click **Next**.

    Note: The following characters can be used in a folder name: `A-Z`, `a-z`, `0-9`, periods (.), underscores (_), and space characters.

13. If either of the following conditions is satisfied, a panel appears (see Figure 3.10) for selecting the destination in which to create the database files that HiCommand Suite Common Component uses. Select the default destination folder or enter a different destination folder in which to create the files, and then click **Next**.

    - Tuning Manager is the only installed HiCommand Suite product that is currently using HiCommand Suite Common Component.
    - A version earlier than 4.0 of a HiCommand Suite product is installed.

    Note: Confirm that there is at least 1.2 GB of free space in the specified folder. The following characters can be used in a folder name: `A-Z`, `a-z`, `0-9`, periods (.), underscores (_), and space characters.

14. A panel for selecting the size of the HiRDB database appears (see Figure 3.11). Select the desired size (**Small**, **Medium**, or **Large**) based on the number of resources to be monitored by Tuning Manager. For important information on selecting the appropriate database size for your Tuning Manager installation, see Appendix D and Table D.2. Select the size and then click **Next** button to continue.

    Note: If Device Manager has already been installed on the same machine, do not select **Large**.

15. A panel for selecting the destination for the Tuning Manager database files appears (see Figure 3.12). Select the default destination folder or an optional destination folder, and then click **Next**.

    Note: The following characters can be used in a folder name: `A-Z, a-z, 0-9`, periods (.), underscores (_), and space characters.

16. The Start Copying Files panel displays and allows you to confirm the entries you made (see Figure 3.13). If you need to change one or more entries, click **Back** and then repeat the steps from step 12 through step 15. When the entries are correct, click **Next** button to start the Server Part 2 installation.

    The progress of the installation is displayed.

17. When the installation of Server Part 2 finishes, a completion panel is displayed (see Figure 3.14). Click **Finish** to finish the Server Part 2 installation.

After installing the Tuning Manager server software, you can install Agents on the desired machines. For installation instructions, see Chapter 5.

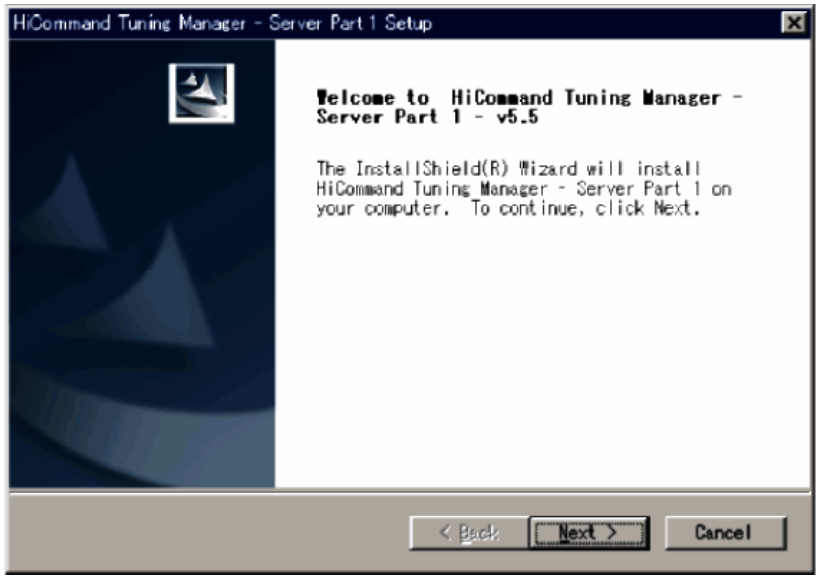


Figure 3.1 Startup Panel for Server Part 1 Installation

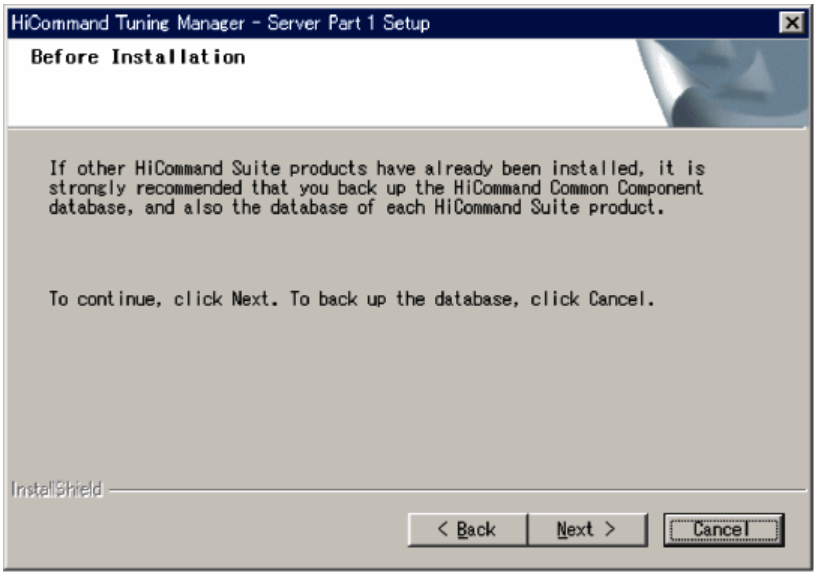


Figure 3.2 Reminder to Back up Database(s) Before Server Part 1 Installation

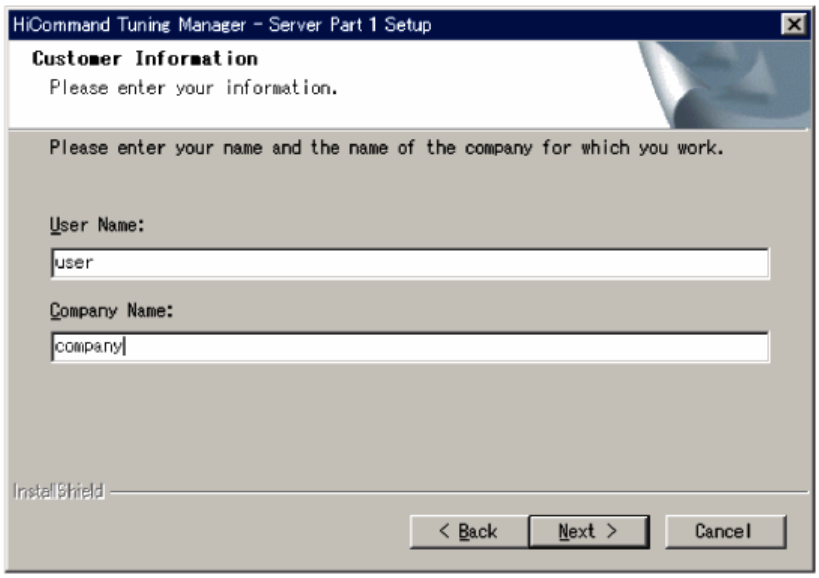


Figure 3.3 Entering Your User Name and Company Name Information

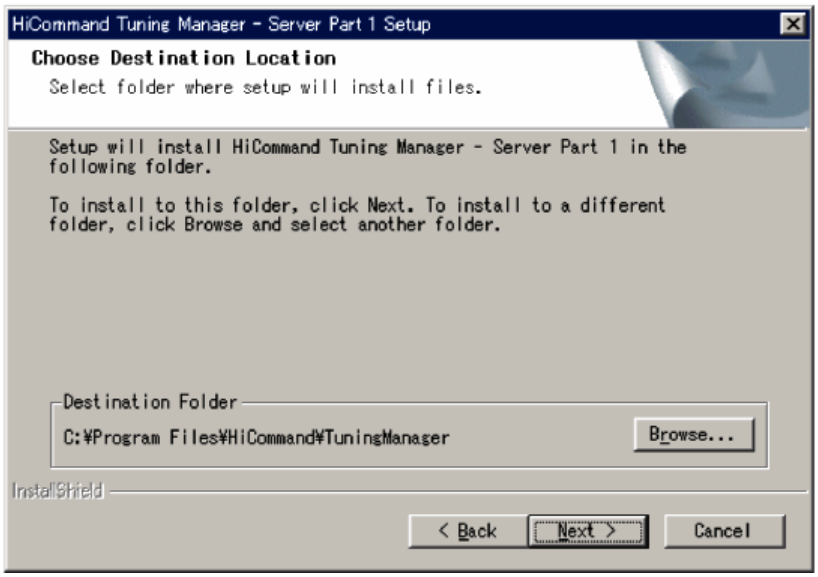


Figure 3.4 Selecting a Folder for HiCommand Tuning Manager

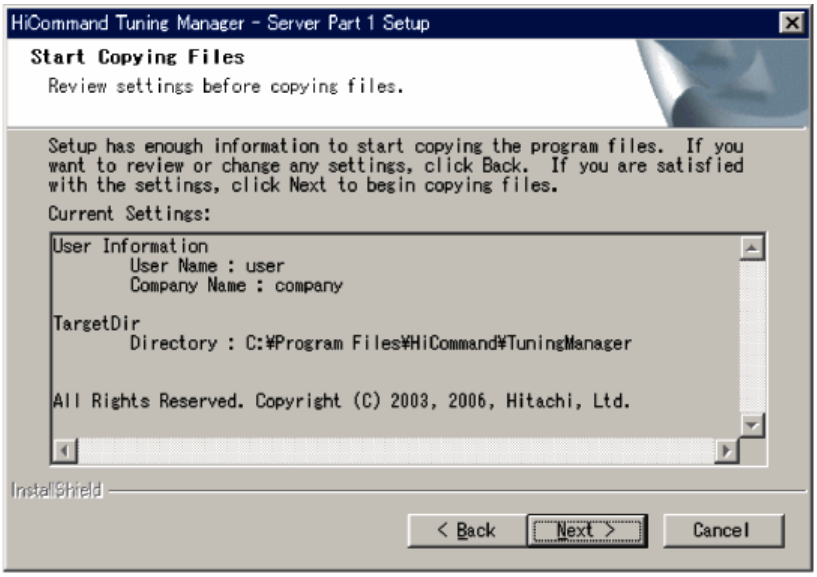


Figure 3.5 Confirming the Server Part 1 Installation Settings

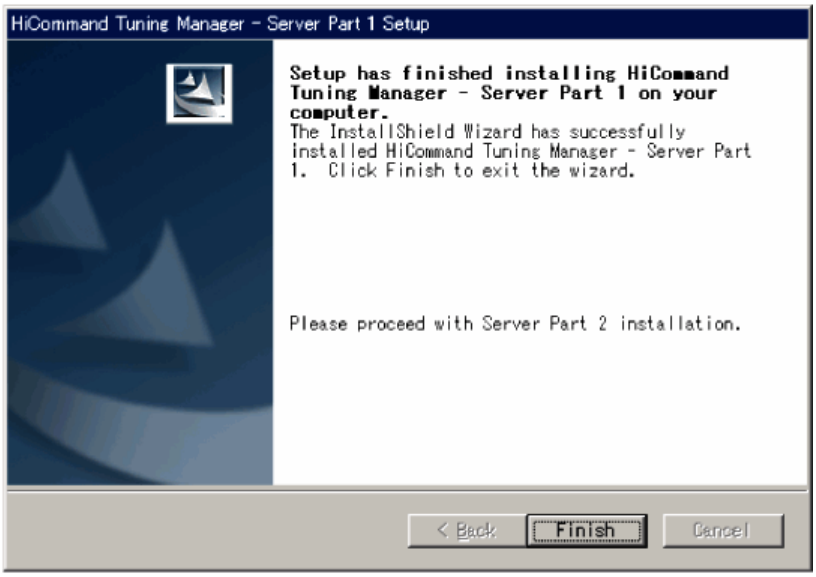


Figure 3.6 Server Part 1 Installation Complete

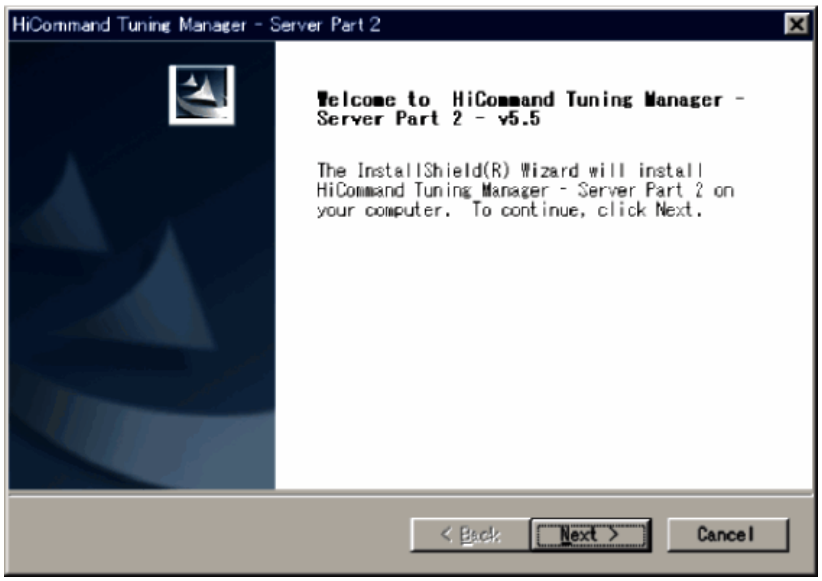


Figure 3.7 Startup Panel for Server Part 2 Installation

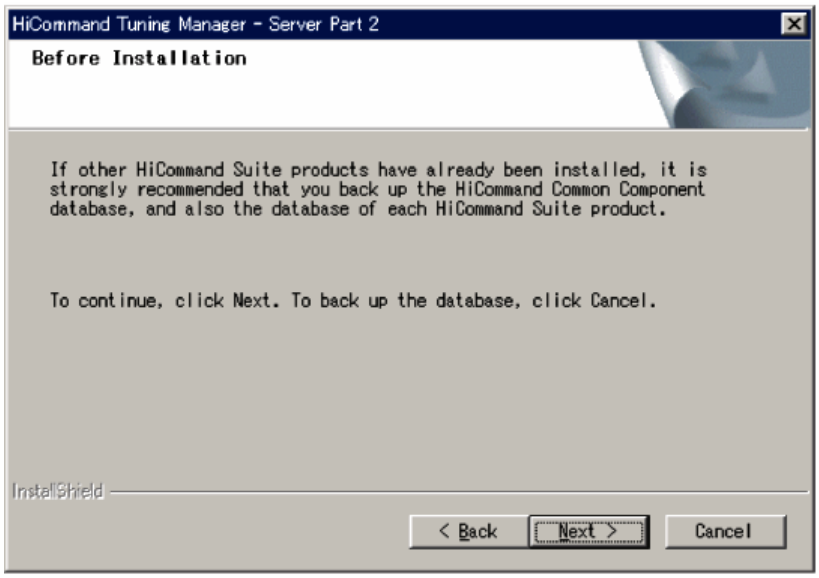


Figure 3.8 Reminder to Back up Database(s) Before Server Part 2 Installation

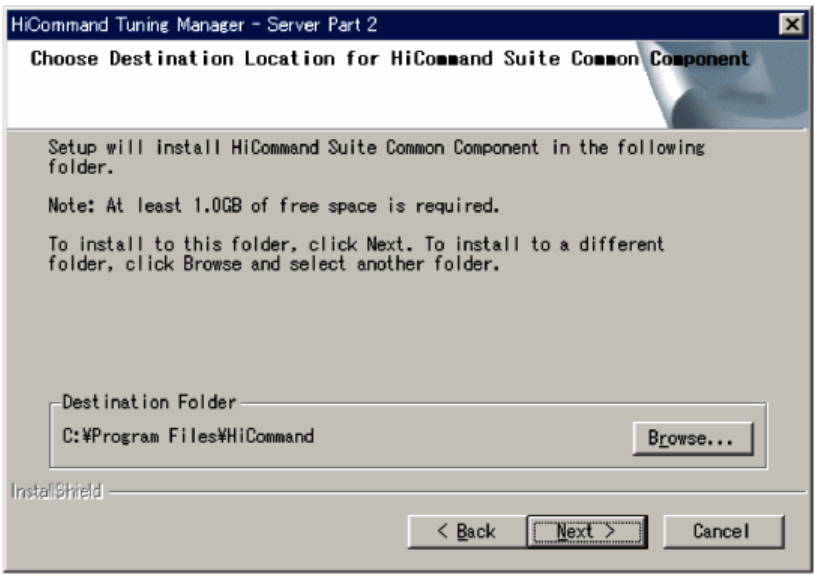


Figure 3.9 Selecting the Folder for HiCommand Suite Common Component

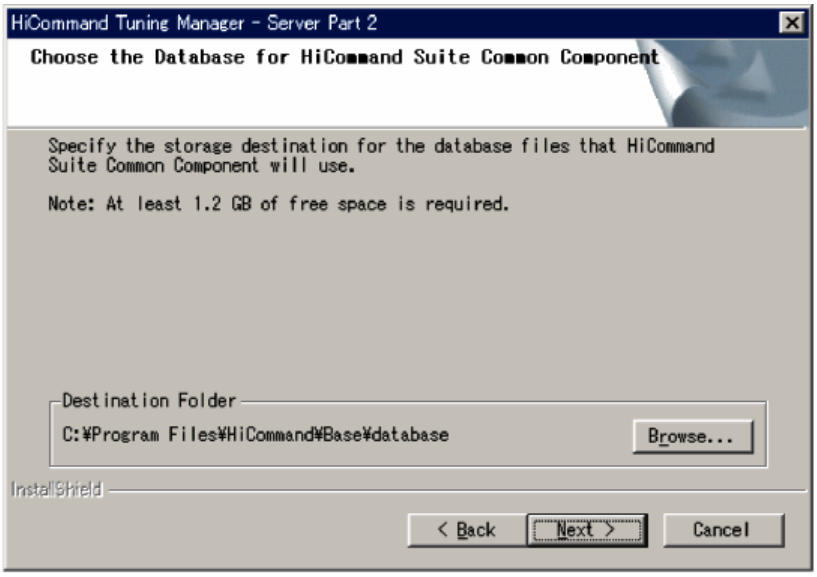


Figure 3.10 Selection Panel for Choosing the Destination Folder for Creating the Database Files of HiCommand Suite Common Component

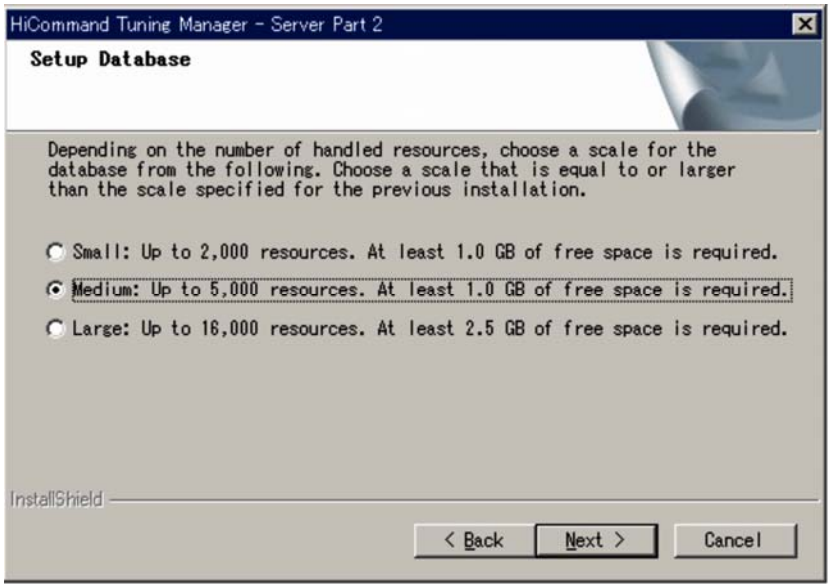


Figure 3.11 Selecting the Size of the HiRDB Database

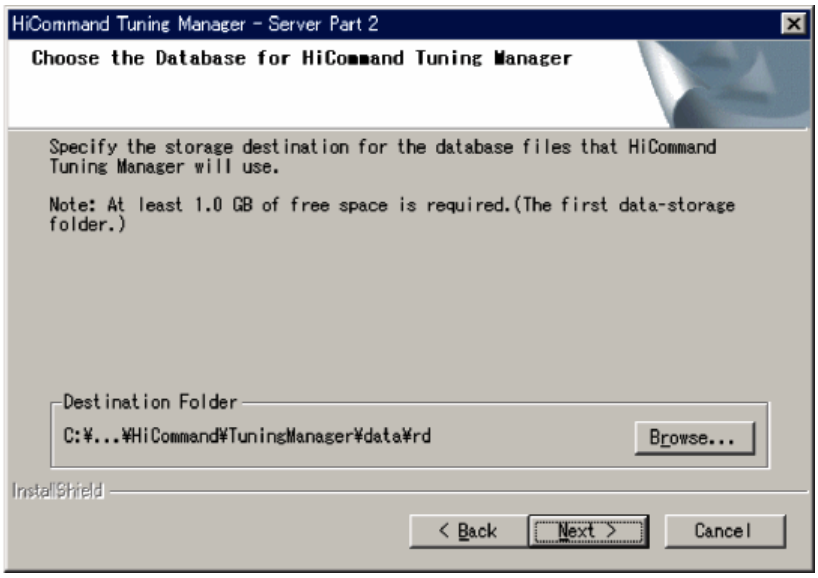


Figure 3.12 Selecting the Folder for the Tuning Manager Database Files

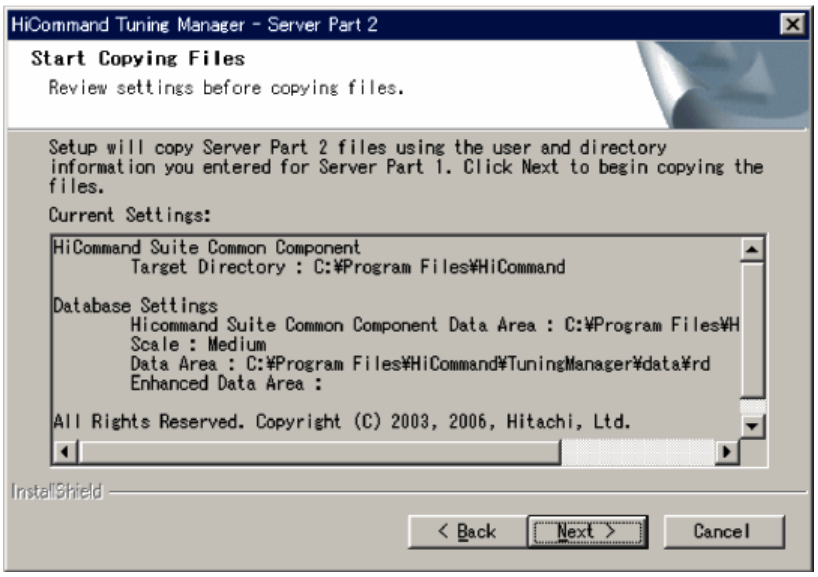


Figure 3.13 Confirming the Server Part 2 Installation Settings

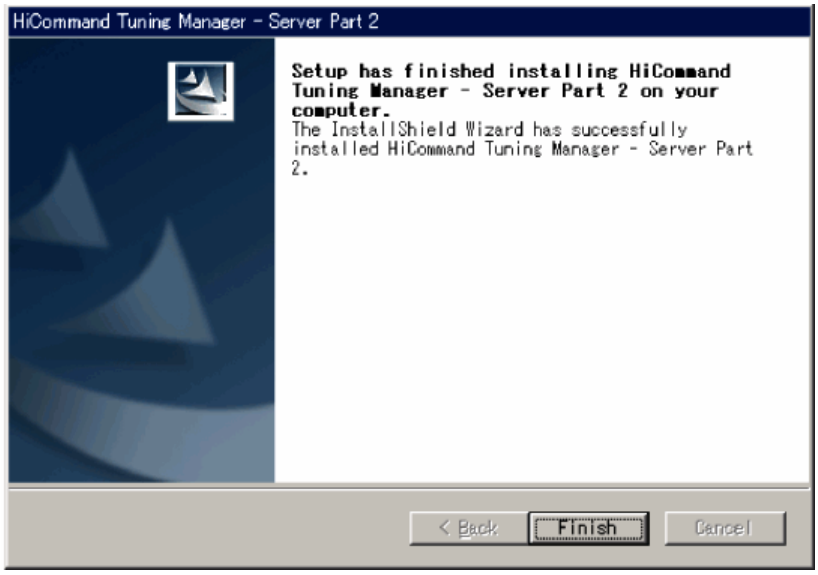


Figure 3.14 Server Part 2 Installation Complete

3.1.2 Repair Installation on a Windows Host

You can perform a repair installation starting with either Server Part 1 or Server Part 2.

3.1.2.1 Using Server Part 1 for a Repair Installation

To repair the components originally installed from Server Part 1:

1. Stop all HiCommand services for Tuning Manager.

   For details on how to stop HiCommand-related services, see the *HiCommand Tuning Manager Server Administration Guide*.

2. Insert the installation CD into your CD-ROM drive.
3. Display the contents of the installation CD (for example, by using Windows Explorer) and double-click the `setup.exe` file in the `\ServerPart1` folder.
4. When the Setup Type panel for Server Part 1 appears (see Figure 3.15), select **Repair** and click **Next** to continue.
5. When the Repair panel for Server Part 1 appears (see Figure 3.16), click **Next** to begin the repair installation.
6. A panel appears, recommending that you back up the databases for the HiCommand Suite Common Component and HiCommand Suite products (see Figure 3.17). If no version 4.0 or later HiCommand Suite product has been installed, or if the backup has already been created, click **Next**. The progress of the repair installation is displayed.
7. When the Server Part 1 repair installation completes, the installer notifies you with a completion panel (see Figure 3.18). To exit the repair installation, click **Finish**. You do not need to restart your computer after the repair installation using Server Part 1.

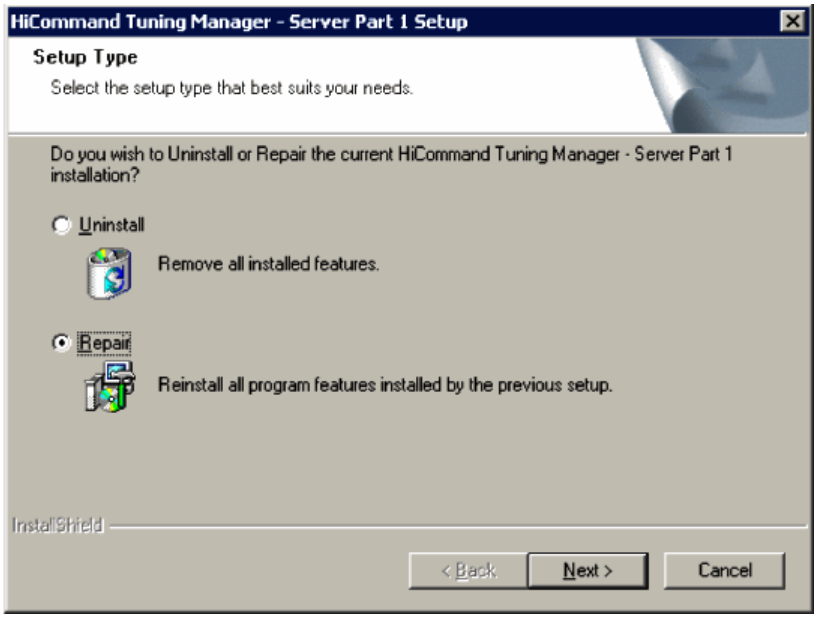


Figure 3.15 Selecting Repair Installation on the Setup Type Panel for Server Part 1

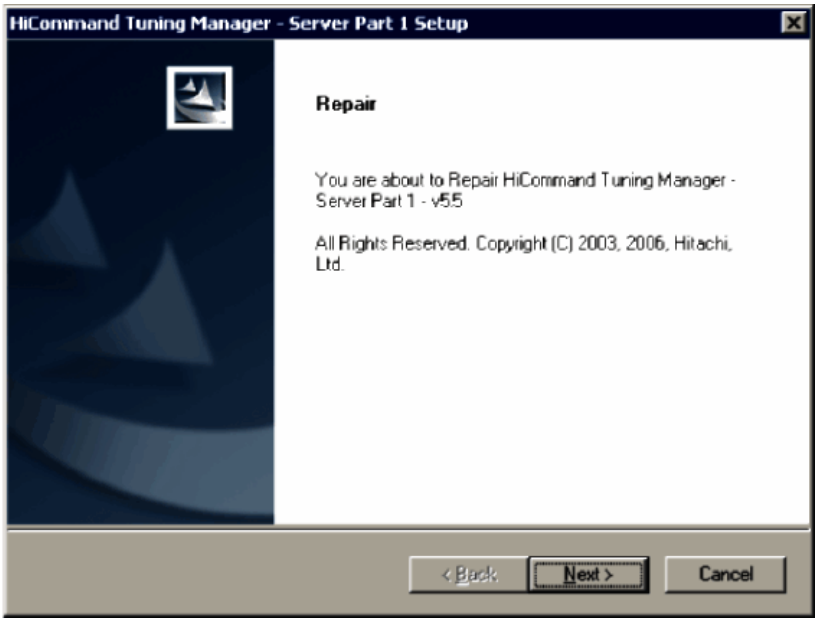


Figure 3.16 Startup Panel for Server Part 1 Repair Installation

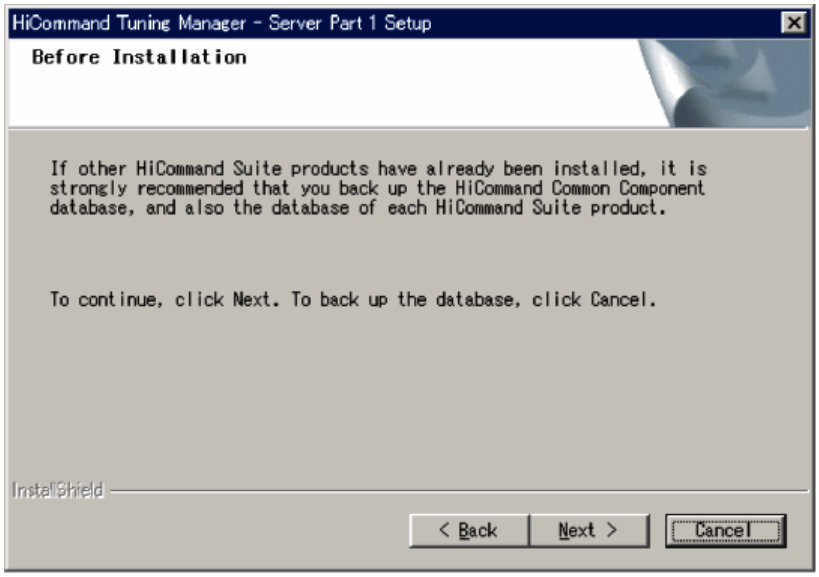


Figure 3.17 Reminder to Back up Database(s) Before Server Part 1 Repair Installation

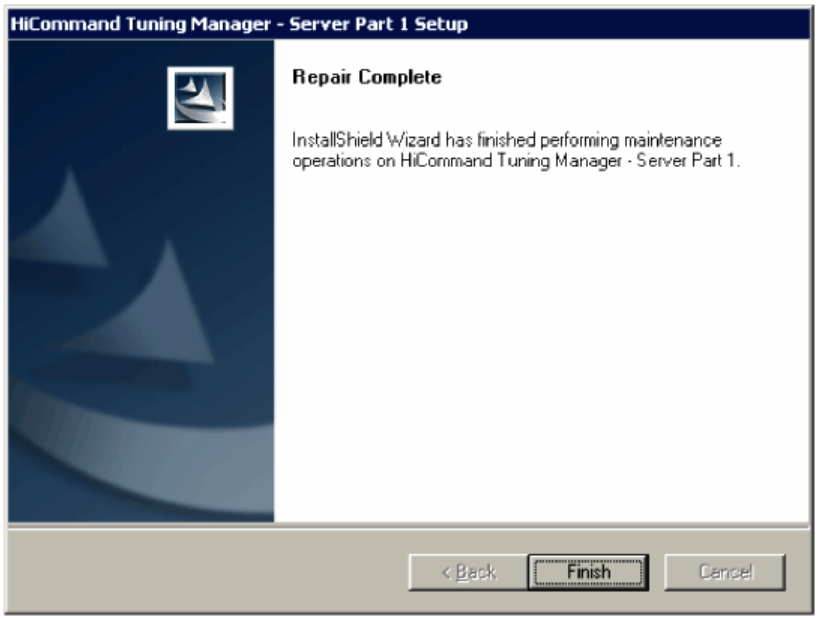


Figure 3.18 Server Part 1 Repair Installation Complete

3.1.2.2 Using Server Part 2 for a Repair Installation

To repair the components originally installed from Server Part 2:

1. If you have not performed the repair installation using Server Part 1 before the one using Server Part 2, stop all HiCommand-related services before performing the repair installation of Tuning Manager.

   For details on how to stop services, see the *HiCommand Tuning Manager Server Administration Guide*.

2. Insert the installation CD into your CD-ROM drive, if you have not already done so.

3. Display the contents of the installation CD (for example, by using Windows Explorer), and double-click the `setup.exe` file in the `\ServerPart2` folder.

4. When the Setup Type panel for Server Part 2 appears (see Figure 3.19), select **Repair** and click **Next** to continue.

5. When the Repair panel for Server Part 2 appears (see Figure 3.20), click **Next** to continue.

6. A panel appears, recommending that you back up the databases for the HiCommand Suite Common Component and HiCommand Suite products (see Figure 3.21). If no version 4.0 or later HiCommand Suite product has been installed, or if the backup has already been created, click **Next**.

7. A panel appears for selecting whether the existing database contents are to be inherited. The displayed panel varies, depending on whether or not data migration from InterBase to HiRDB is required.

   If a new HiRDB database is created, or database migration from InterBase to HiRDB has finished (see Figure 3.22):

   - If you click **Yes**:

     The existing database contents are not deleted.

   - If you click **No**:

     The existing database contents are deleted and a new HiRDB database is created.

   If data migration from InterBase to HiRDB has not finished (see Figure 3.23):

   - If you select **Yes, convert the database during installation.**:

     The InterBase database is migrated to the HiRDB database during the repair installation. If the InterBase service is not running, a panel asking whether the InterBase service is running appears. After starting the InterBase service, click **Yes**. It might take some time to migrate the database. Select this if you can reserve an extended period of time for the migration.

   - If you select **Yes, convert the database after installation.**:

     The InterBase database is not migrated to the HiRDB database during the repair installation. In such a case, after finishing the repair installation, execute the `htm-db-convert` command to migrate the database. It might take an extended period of time to migrate the database. Select this if you cannot reserve an extended period of time.

– If you click **No**:

  The existing database contents are deleted and a new HiRDB database is created.

8. If you selected **No** in step 7, or if the size of the HiRDB database has been set to **Small** or **Medium**, a panel appears prompting you to select the size of the HiRDB database (see Figure 3.24). Select the desired size, and then click **Next**.

   The size you select depends on the number of resources. For details on the size to be selected, see Appendix D and Table D-3. If you do not save the contents of the database, you can select a size smaller than the size of the current database.

   Note:

   If Device Manager has already been installed on the same machine, do not select **Large**.

9. If you selected **No** in step 7, or if the size has been changed from **Small** or **Medium** to **Large**, a panel appears prompting you to select the destination folder for the Tuning Manager database files (see Figure 3.25). Select the desired destination for the database files, and then click **Next**. Make sure that the specified folder has the required amount of free space.

   Notes:

   – Make sure that the specified folder has enough free space: more than that required for the size that you selected in step 8.

   – The following characters can be used in the folder name: `A-Z`, `a-z`, `0-9`, periods (`.`), underscores (`_`), and space characters.

10. The Start Copying Files panel displays and allows you to confirm the entries you made (see Figure 3.26). If you need to change one or more entries, click **Back** and repeat any of the steps from step 7 through step 9 as needed. When the entries are correct, click **Next** to start the Server Part 2 repair installation.

    The progress of the repair installation is displayed.

    If database migration is performed from InterBase to HiRDB, the progress of the database migration is displayed (see Figure 3.27).

11. When the Server Part 2 installation finishes, the Server Part 2 installation completion panel appears (see Figure 3.28). Select **Finish** to finish the Server Part 2 repair installation.

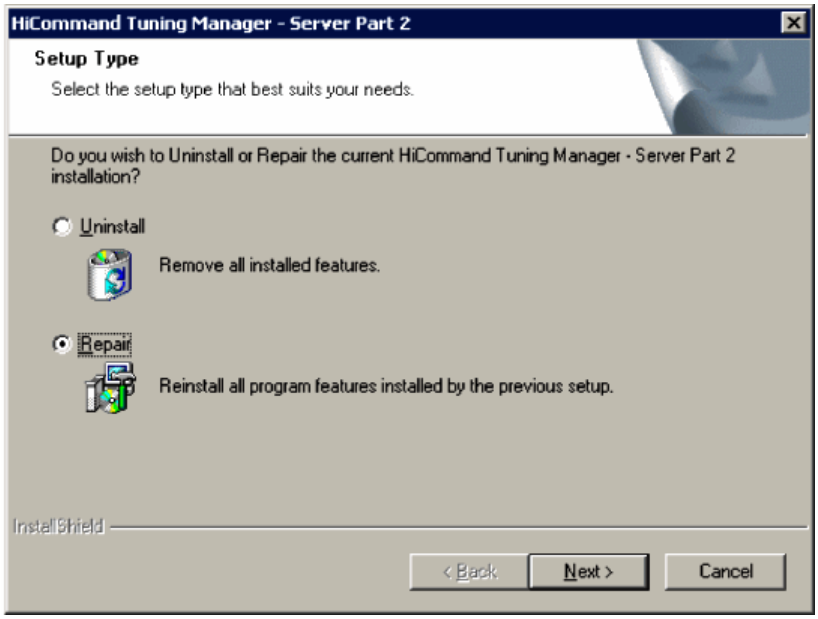


Figure 3.19 Selecting Repair Installation on the Setup Type Panel for Server Part 2

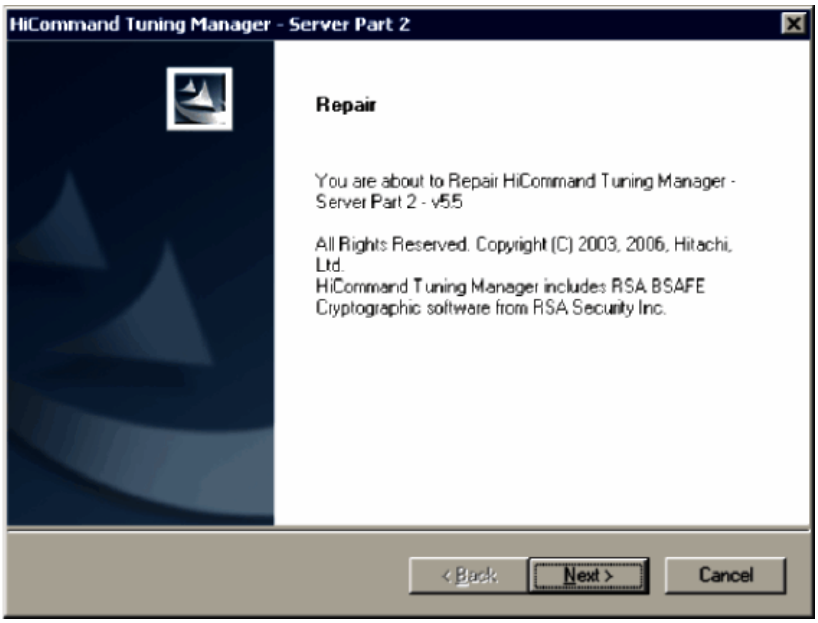


Figure 3.20 Startup Panel for Server Part 2 Repair Installation

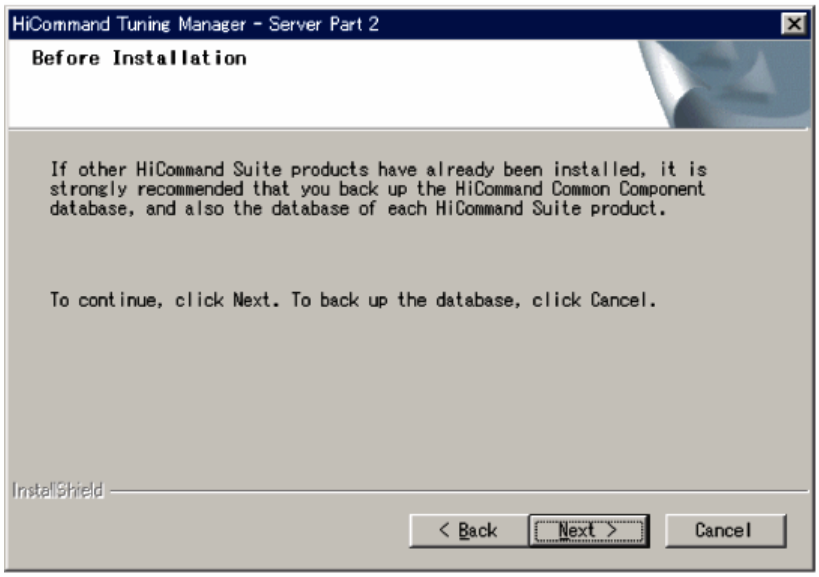


Figure 3.21 Reminder to Back up Database(s) Before Server Part 2 Repair Installation

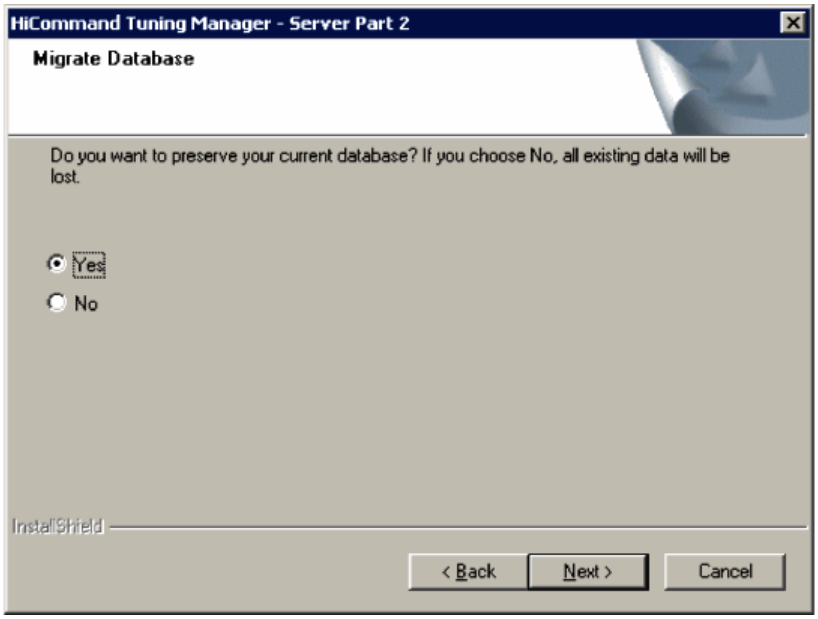


Figure 3.22 Selecting the Preserve Database Option (Migration Complete)

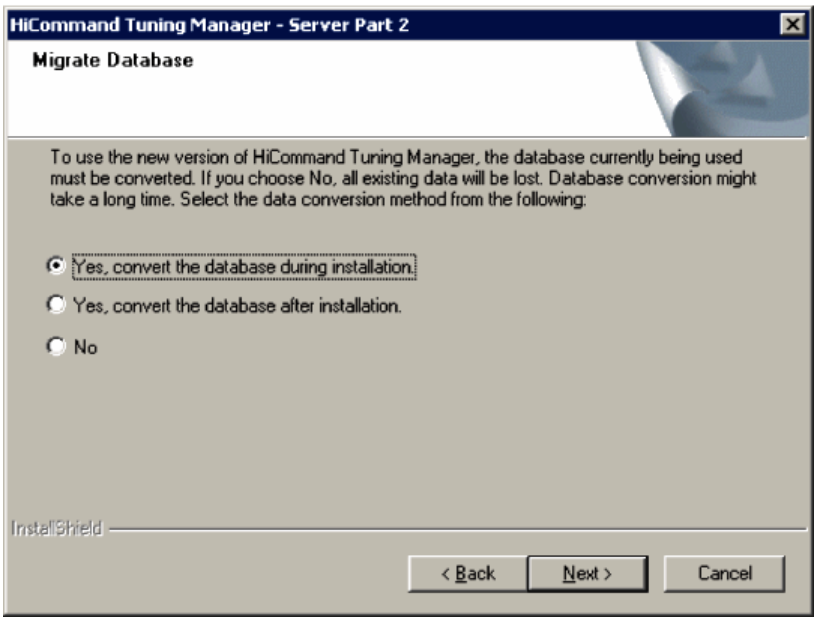


Figure 3.23 Selecting the Preserve Database Option (Migration Required)

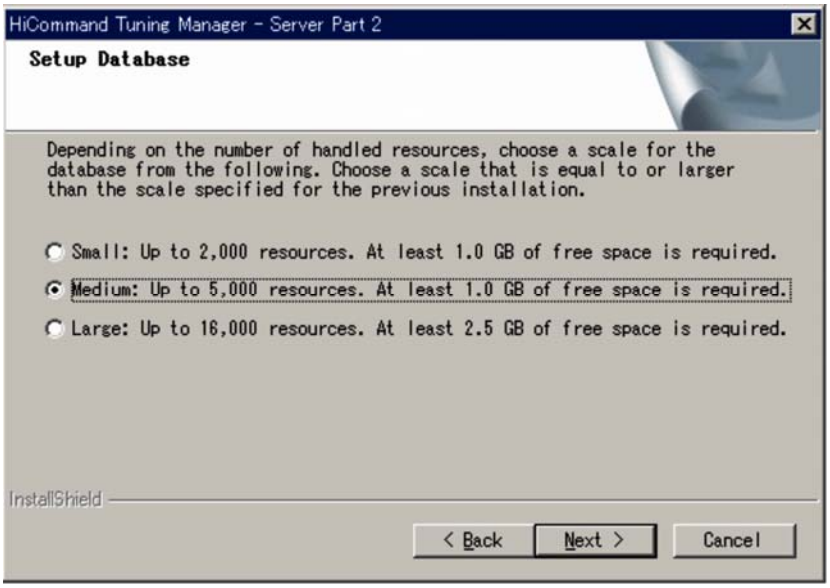


Figure 3.24 Panel for Choosing the Size of the HiRDB Database

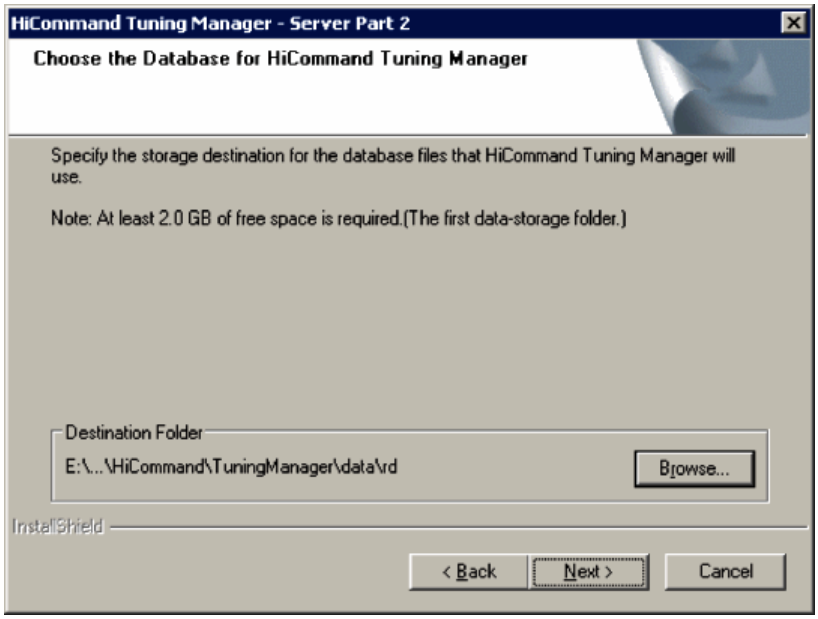


Figure 3.25 Selecting the Folder for the Tuning Manager Database Files

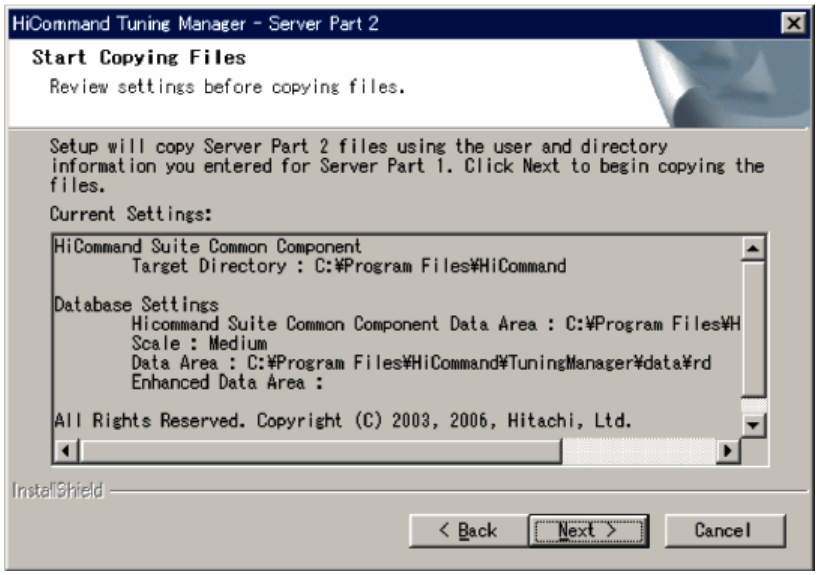


Figure 3.26 Confirming the Server Part 2 Repair Installation Settings

Figure 3.27 Progress of Database Migration from InterBase to HiRDB

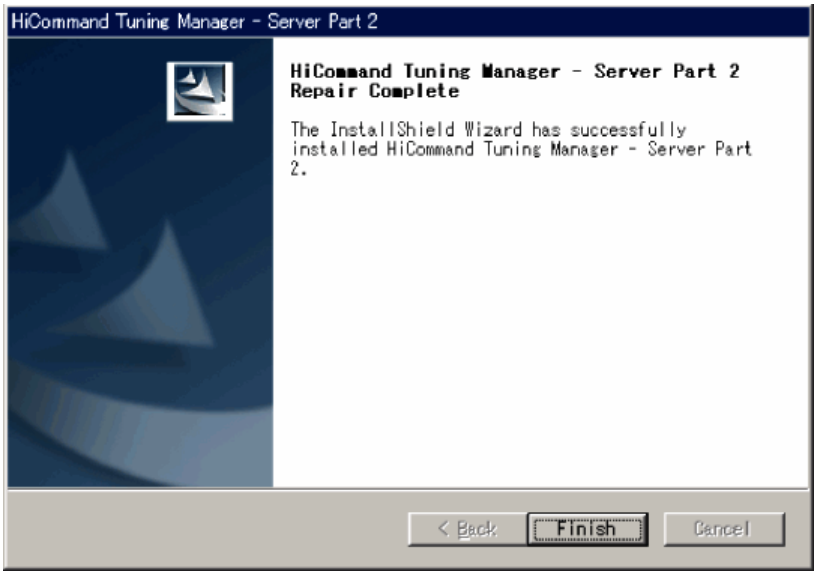


Figure 3.28 Server Part 2 Repair Installation Complete

3.1.3 Upgrade Installation on a Windows Host

Before upgrading Tuning Manager:

- Back up the Tuning Manager database.
- Stop the HiCommand-related services.

For details, see the manual for the existing Tuning Manager.

To use Server Part 1 for an upgrade installation:

1. Before performing an update installation of Tuning Manager, stop existing HiCommand-related services.
2. Insert the installation CD into your CD-ROM drive.
3. Display the contents of the installation CD (for example, by using Windows Explorer), and then double click the `setup.exe` file in the `\ServerPart1` folder.

   The Upgrade panel for Server Part 1 appears (see Figure 3.29).
4. Click **Next** to start installing the upgrade.
5. A panel appears, recommending that you back up the databases for HiCommand Suite Common Component and HiCommand Suite products (see Figure 3.30). If version 4.0 or later of a HiCommand Suite product has not been installed, or if the backup has already been created, click **Next**.

   A Setup Status panel appears and displays the progress of the installation. When the upgrade process from Server Part 1 completes, a completion panel is displayed (see Figure 3.31).
6. Click **Finish** to complete the installation of Server Part 1. Then, proceed with the upgrade installation of Server Part 2.

7. Display the contents of the installation CD (for example, by using Windows Explorer), and then double click the `setup.exe` file in the `\ServerPart2` folder.
8. The startup panel for the Server Part 2 upgrade installation appears (see Figure 3.32). Click **Next**.
9. A panel appears, recommending that you back up the databases for HiCommand Suite Common Component and HiCommand Suite products (see Figure 3.33). If version 4.0 or later of a HiCommand Suite product has been not installed, or if the backup has already been created, click **Next**.
10. A panel for selecting whether the existing database contents are inherited appears. The displayed panel varies depending on whether or not data migration from InterBase to HiRDB has finished.

    If a new HiRDB database is made, or if data migration from InterBase to HiRDB has finished (see Figure 3.34), then if you click:

    - **Yes**, the existing database contents are not deleted.
    - **No**, the existing database contents are deleted and a new HiRDB database is created.

    If data migration from InterBase to HiRDB has not finished (see Figure 3.35):

    - If you select **Yes, convert database during installation**, the InterBase database is migrated to the HiRDB database during the upgrade installation. If the InterBase service is not running, a panel asking whether the InterBase is running appears. After starting the InterBase service, click **Yes**. It might take some time to migrate the database. Select this option if you can reserve an extended period of time for the migration.
    - If you select **Yes, convert the database after installation**, the InterBase database is not migrated to the HiRDB database during the upgrade installation. In such a case, after finishing the upgrade installation, execute the `htm-db-convert` command to migrate the database. It might take some time to migrate the database. Select this option if you cannot reserve an extended period of time.
    - If you click **No**, the existing database contents are deleted and a new HiRDB database is created.
11. When you are performing an upgrade installation from version 3.5 or earlier, a panel appears for selecting the destination for creating the database files used by HiCommand Suite Common Component (see Figure 3.36). However, if other HiCommand products (version 4.0 or later) are installed on the same machine, the panel does not appear.

    Select the default destination folder or an optional destination folder for creating the files, and then click **Next**.

    Notes:

    - Confirm that there is at least 1.2 GB of free space in the folder.
    - The following characters can be used in the folder name: `A-Z`, `a-z`, `0-9`, periods (`.`), underscores (_), and space characters.

12. When you are performing an upgrade installation from version 3.5 or earlier, if you selected **No** in step 10, or if the size of the HiRDB database has been set to **Small** or **Medium** in version 4.0 or later, a panel appears prompting you to select the size of the HiRDB database (see Figure 3.37). Select the desired size, and then click **Next**.

    The size you select depends on the number of resources. For details on the size to be selected, see Appendix D, Table D.4, or Table D.5. If you do not save the contents of the database, you can select a size smaller than the size of the current database.

    Note:

    If Device Manager has already been installed on the same machine, do not select **Large**.

13. When you are performing an upgrade installation from version 3.5 or earlier, if you selected **No** in step 10, or if the size of the database has been changed from **Small** or **Medium** to **Large** in step 12, a panel appears prompting you to select the destination for creating the database files that Tuning Manager uses (see Figure 3.38). Select the desired destination for creating the files, and then click **Next**.

    Notes:

    – Make sure that the specified folder has enough free space: more than the amount specified in step 12.

    – The following characters can be used in the folder name: `A-Z`, `a-z`, `0-9`, periods (`.`), underscores (_), and space characters.

14. Before copying files, a panel appears that displays a summary of the settings (see Figure 3.39). Click **Next** to copy the files.

    A panel indicating the progress of the installation appears.

    When you perform a data migration from InterBase to HiRDB, a panel indicating the progress of the database migration processing appears (see Figure 3.40).

    When the installation of Server Part 2 finishes, the Server Part 2 installation completion panel appears (see Figure 3.41).

15. To finish the installation of Server Part 2, click **Finish**.

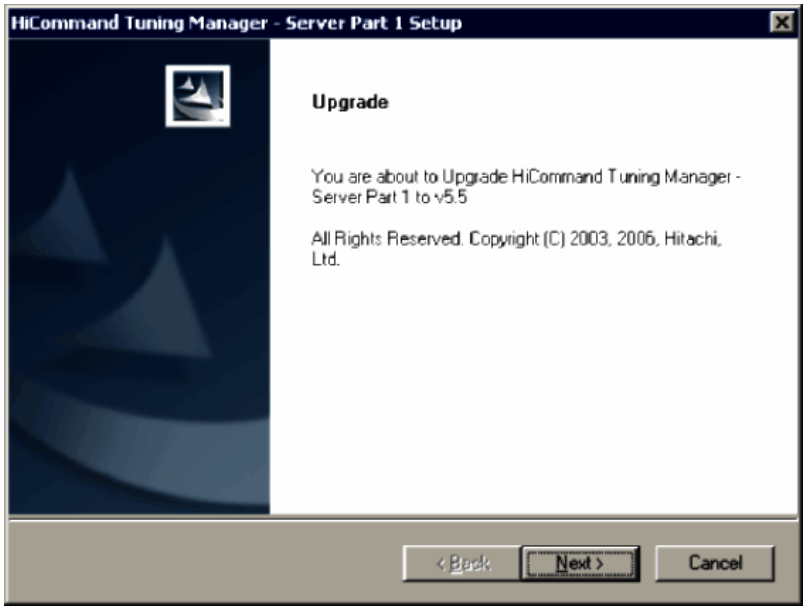


Figure 3.29 Setup Panel for Server Part 1 Upgrade Installation

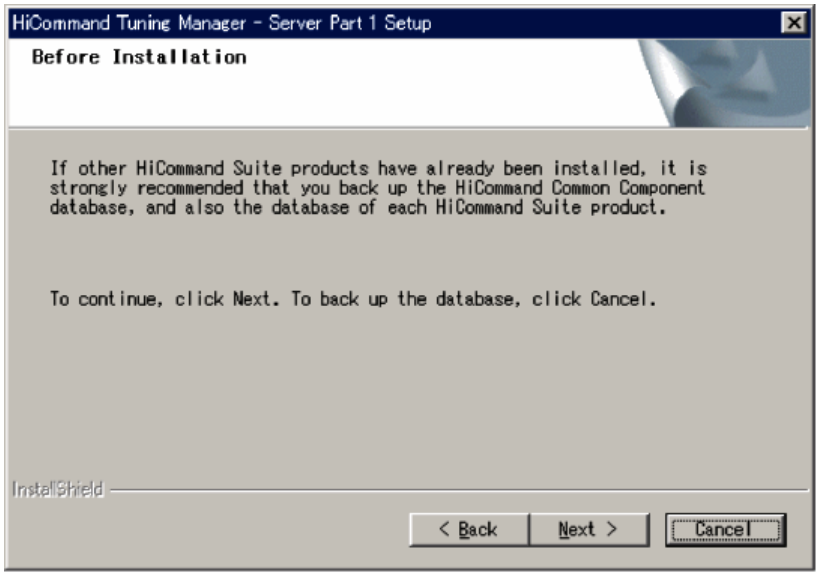


Figure 3.30 Reminder to Back up Database(s) Before Server Part1 Upgrade Installation

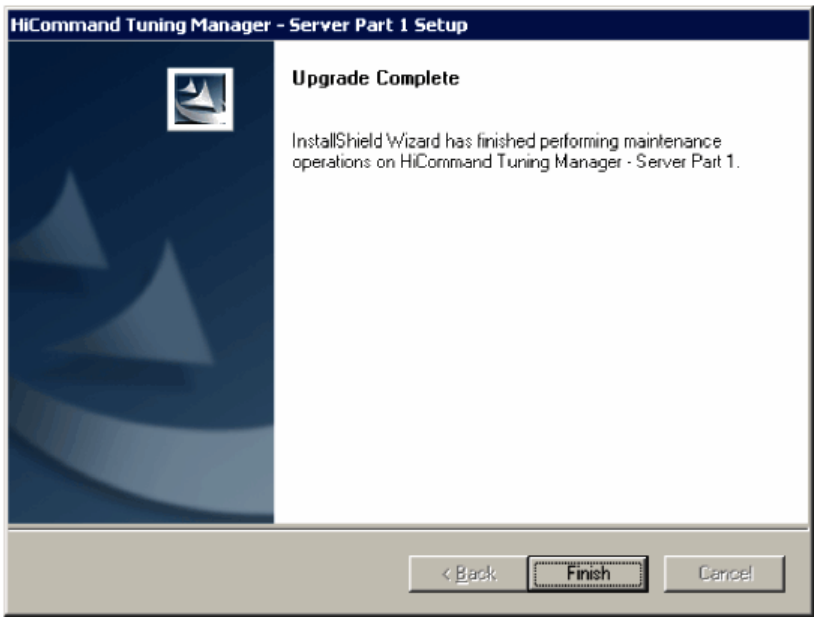


Figure 3.31 Server Part 1 Upgrade Complete

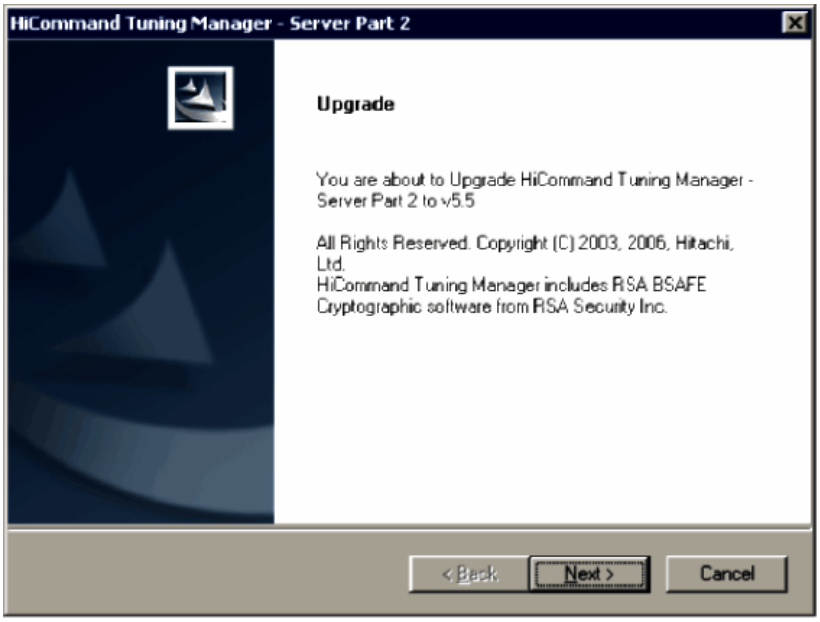


Figure 3.32 Startup Panel for Server Part 2 Upgrade Installation

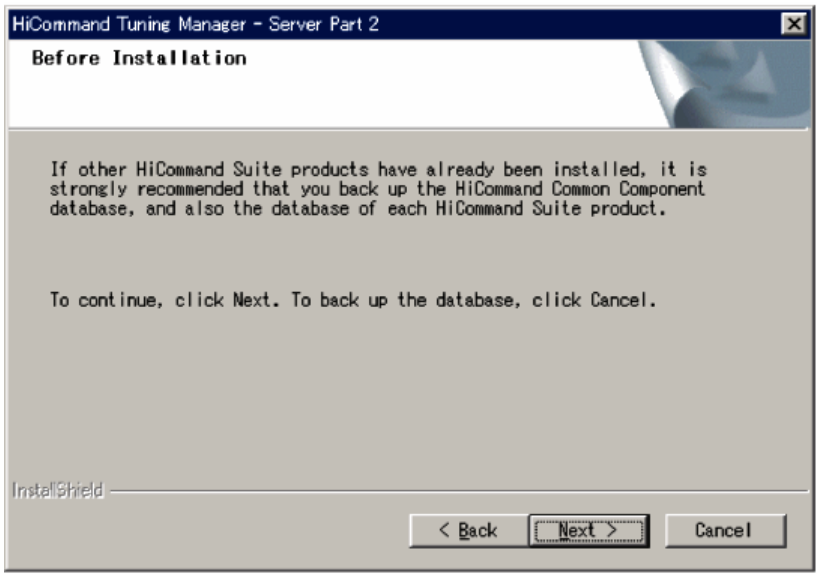


Figure 3.33 Reminder to Back up Database(s) Before Server Part2 Upgrade Installation

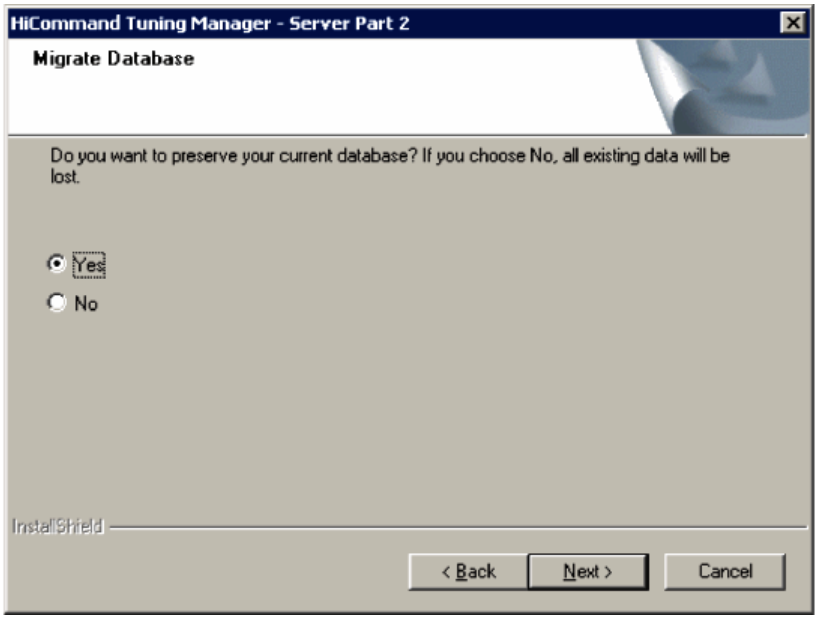


Figure 3.34 Selecting the Preserve Database Option (Migration Complete)

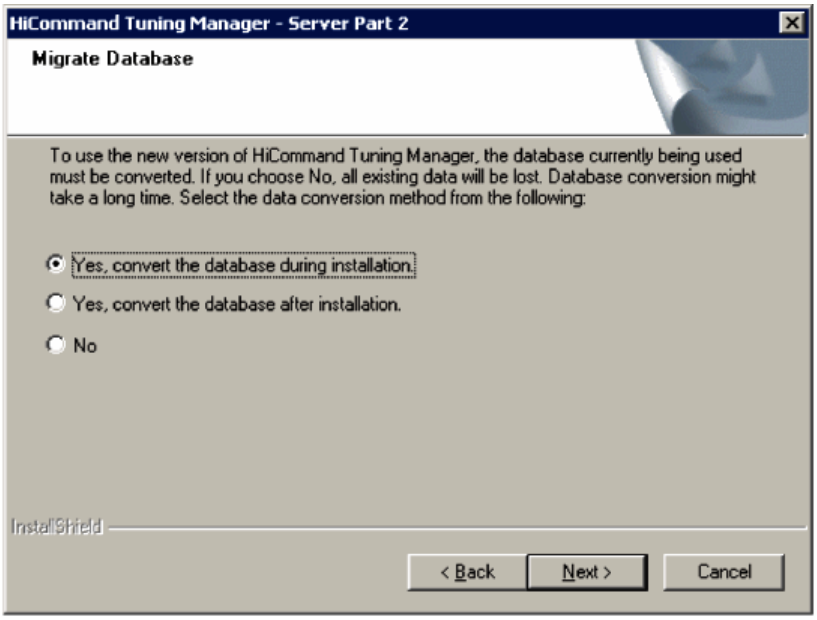


Figure 3.35 Selecting the Preserve Database Option (Migration Required)

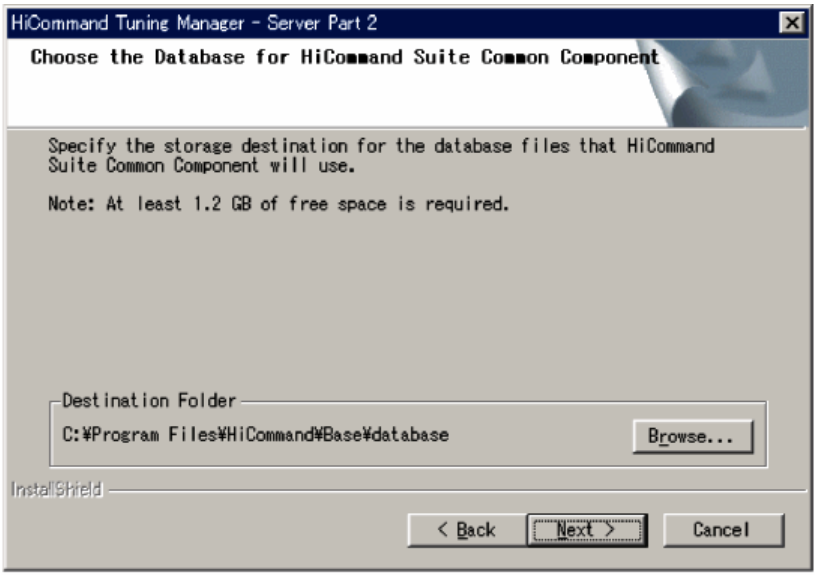


Figure 3.36 Choosing the Destination Folder for Creating the Database Files of HiCommand Suite Common Component

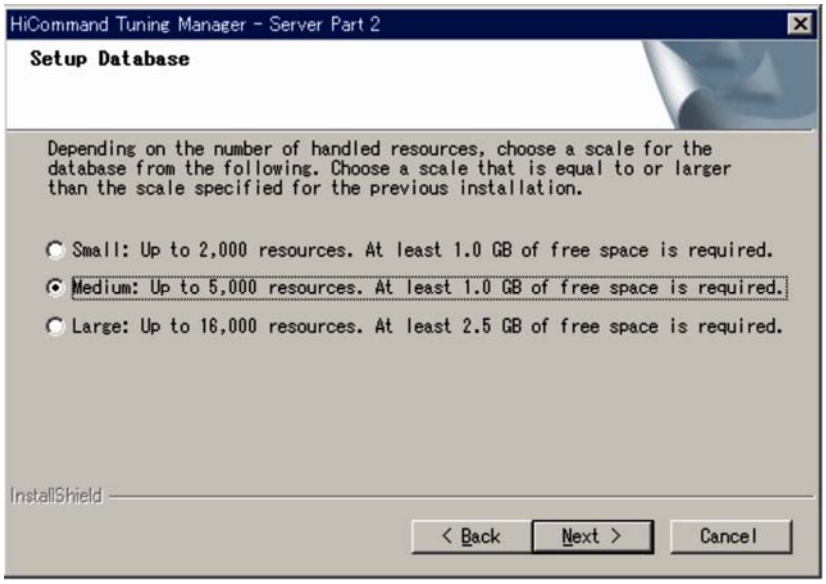


Figure 3.37 Selecting the Size of the HiRDB Database

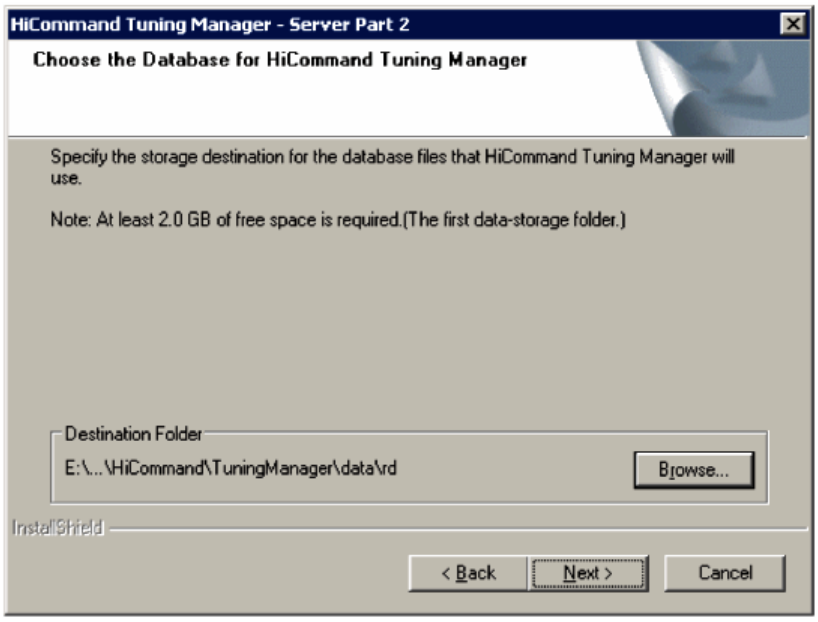


Figure 3.38 Selecting the Folder for the Tuning Manager Database Files

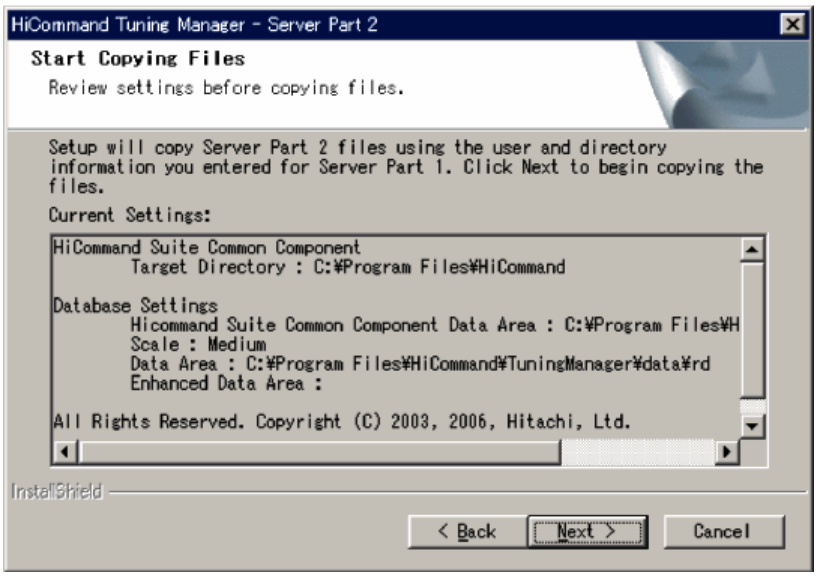


Figure 3.39 Confirming the Server Part2 Upgrade Installation Settings

Figure 3.40 Progress of Database Migration from InterBase to HiRDB

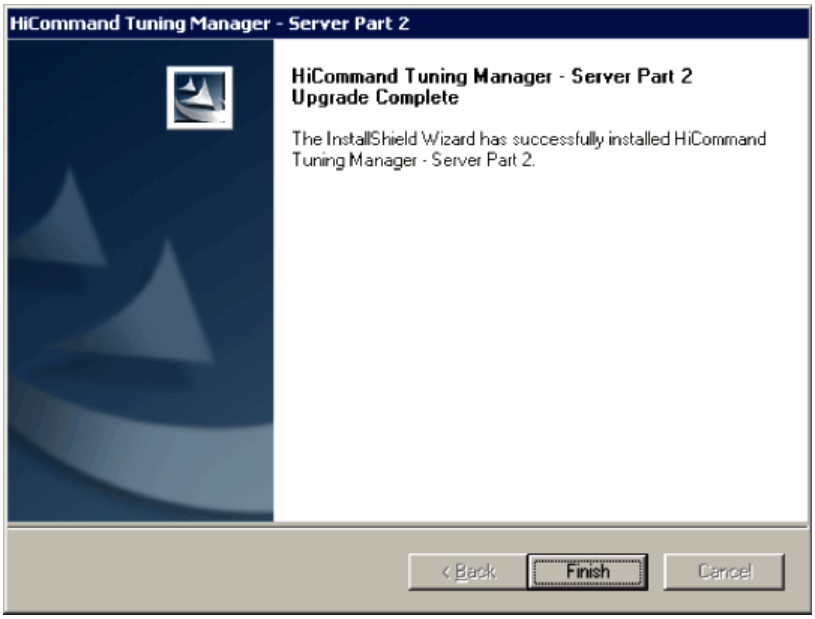


Figure 3.41 Server Part 2 Upgrade Installation Complete

3.1.4 Performance Reporter Configurations

Performance Reporter is installed and uninstalled as part of the overall Tuning Manager installation and uninstallation. The default installation folder for Performance Reporter is:

system-drive\Program Files\HiCommand\TuningManager\PerformanceReporter\

Table 3.1 shows the locations of the Performance Reporter files. Table 3.2 shows the locations of the war files, which are stored in the webapps folder.

Table 3.1 Locations of the Performance Reporter Files

Description	File or Folder Names
Uninstaller response file	*Performance-Reporter-installation-folder*\uninst.iss
Log output folder	*Performance-Reporter-installation-folder*\log\
Command folder	*Performance-Reporter-installation-folder*\tools\
Command file	*Performance-Reporter-installation-folder*\tools*.exe
	Performance-Reporter-installation-folder\tools*.bat
Library, internal command folder	*Performance-Reporter-installation-folder*\lib\
Library, internal command file	*Performance-Reporter-installation-folder*\lib*.jar
	Performance-Reporter-installation-folder\lib*.exe
config file folder	*Performance-Reporter-installation-folder*\conf\
config file	*Performance-Reporter-installation-folder*\conf\config.xml
config DTD file	*Performance-Reporter-installation-folder*\conf\config.dtd
Display message resource file	*Performance-Reporter-installation-folder*\conf\DispMessages.xml
Log message resource file	*Performance-Reporter-installation-folder*\conf\LogMessages.xml
Message DTD file	*Performance-Reporter-installation-folder*\conf\Messages.dtd
DTD file for commands	*Performance-Reporter-installation-folder*\conf*.dtd
Storage file for build number	*Performance-Reporter-installation-folder*\conf\build
System property file	*Performance-Reporter-installation-folder*\conf\pr.properties
Storage folder for agent setup files	*Performance-Reporter-installation-folder*\setup\
Storage folder for war file	*Performance-Reporter-installation-folder*\webapps\
War file	*Performance-Reporter-installation-folder*\webapps\PerformanceReporter.war
Storage folder for manual	*Performance-Reporter-installation-folder*\docs\
Manual HTML file	*Performance-Reporter-installation-folder*\docs*.htm
Storage folder for manual	*Performance-Reporter-installation-folder*\docs\figure

Description	File or Folder Names
images	
Manual image file	*Performance-Reporter-installation-folder*\docs\figure*.gif
Storage folder for sample files	*Performance-Reporter-installation-folder*\sample\
Storage folder for original file of config.xml	*Performance-Reporter-installation-folder*\sample\conf\
Original config.xml file	*Performance-Reporter-installation-folder*\sample\conf\config.xml
Storage folder for resource file	*Performance-Reporter-installation-folder*\resources\
Storage folder for data model file	*Performance-Reporter-installation-folder*\resources\descriptions\
Data model file	*Performance-Reporter-installation-folder*\resources\descriptions*.dat
Storage folder for bookmarks	*Performance-Reporter-installation-folder*\bookmarks\

Table 3.2 **war** File Contents

Description	File or Folder Names
Default Webapps folder	*system drive*\Program Files\HiCommand\Base\CC\web\containers\PerformanceReporter\webapps\PerformanceReporter
JSP file	*webapps folder*\jsp\pr*.jsp
Image file	*webapps folder*\images*.gif
Agent icon file	*webapps folder*\images\products*.gif
Java Script file	*webapps folder*\scripts*.js
MANIFEST file	*webapps folder*\META-INF\MANIFEST.MF
Style sheet file	*webapps folder*\css*.css
web.xml file	*webapps folder*\WEB-INF\web.xml
struts-config.xml file	*webapps folder*\WEB-INF\struts-config.xml
Tag library file	*webapps folder*\WEB-INF*.tld
Library JAR file	*webapps folder*\WEB-INF\lib*.jar
Resource file	*webapps folder*\WEB-INF\class*.properties
Class file for the PR.form package	*webapps folder*\WEB-INF\com\hitachi\truenorth\HiCommand\PR\form*.class
Class file for the PR.servlets package	*webapps folder*\WEB-INF\com\hitachi\truenorth\HiCommand\PR\servlets*.class

3.2 Installing on a Solaris Host

This section describes how to install Tuning Manager in a Solaris environment. For details about the items that need to be checked before the installation, see Chapter 2.

3.2.1 Initial Installation on a Solaris Host

To use Server Part 1 for installation:

1. Log in to the host as `root` or use the `su` command to become root in your current login session.
2. Insert the installation CD into your CD-ROM drive.
3. Start the installer on the installation CD. This procedure assumes that the CD is mounted in the `/cdrom/cdrom0` directory:

```
/cdrom/cdrom0/ServerPart1/install-ServerPart1.sh
```

The following message appears:

```
WARNING: The kernel parameters must be set before installing HiCommand Tuning Manager.
If the kernel parameters have not been set, enter n to cancel installation.
If the kernel parameters have been set, enter y to continue installation.
Have the kernel parameters for HiCommand Tuning Manager been set? Y/N >
```

4. Check the values of the kernel parameters (operating system parameters) set in `/etc/system` in Solaris. If the values are correct, type `Y` to continue with the installation. If the kernel parameters have not been set or have incorrect values, type `N` to abort the installation. Then, set the correct values for the kernel parameters in `/etc/system`, and then re-install Server Part 1.

   For details on how to set the kernel parameters, see Appendix F.1.

5. When you type `Y`, the following message appears:

```
Begin installation of HiCommand Tuning Manager Server Part 1
Do you wish to start the installation?
To continue, enter Y. (Default Y) Y/N >
```

6. Type `Y` to start the installation. To abort the installation, type `N`. A message recommends that you back up the databases for the HiCommand Suite Common Component and the HiCommand Suite product.

```
If other HiCommand Suite products have already been installed, it is strongly
recommended that you back up the HiCommand Common Component database, and
also the database of each HiCommand Suite product.
To continue, enter Y. (Default Y) Y/N >
```

7. If no version 4.0 or later HiCommand Suite product has been installed, or if the backup has already been created, type `Y` to continue with the installation. To abort the installation, type `N`.

   Upon completion of the Server Part 1 installation, the following message displays.

```
Done installing HiCommand Tuning Manager - Server Part 1
To complete installation, install HiCommand Tuning Manager - Server Part 2 next
```

   Proceed with the installation of Server Part 2.

8. Start the installer on the installation CD. This procedure assumes that the CD is mounted in the `/cdrom/cdrom0` directory:

```
/cdrom/cdrom0/ServerPart2/install-ServerPart2.sh
```

   The installer prompts:

```
WARNING: The kernel parameters must be set before installing HiCommand Tuning Manager.
If the kernel parameters have not been set, enter n to cancel installation.
If the kernel parameters have been set, enter y to continue installation.
Have the kernel parameters for HiCommand Tuning Manager been set? Y/N >
```

9. Check the values of the kernel parameters (operating system parameters) set in `/etc/system` in Solaris. If the values are correct, type `Y` to continue with the installation. If the kernel parameters have not been set or have incorrect values, type `N` to abort the installation. Then, set the correct values for the kernel parameters in `/etc/system` and then perform the installation of Server Part 2 again.

   For details on the settings of the kernel parameters, see Appendix F.1.

   When you type `Y`, the following message appears:

```
Begin installation of HiCommand Tuning Manager Server Part 2
Do you wish to start the installation?
To continue, enter Y. (Default Y) Y/N >
```

10. Type `Y` to continue the installation. To abort the installation, type `N`.

    A message appears, recommending that you back up the databases for HiCommand Suite Common Component and the HiCommand Suite product.

```
If other HiCommand Suite products have already been installed, it is strongly recommended
that you back up the HiCommand Common Component database, and also the database of each
HiCommand Suite product.
To continue, enter Y. (Default Y) Y/N >
```

11. If no version 4.0 or later HiCommand Suite product has been installed, or if the backup has already been created, type `Y` to continue with the installation. To abort the installation, type `N`.

12. If either of the following conditions is satisfied, a message appears for selecting the destination in which to create the database files that HiCommand Suite Common Component uses. Select the default destination directory or enter a different destination directory in which to create the files.

    – Tuning Manager is the only HiCommand Suite product that is installed.

– A version earlier than 4.0 of a HiCommand Suite product is installed.

```
Specify the storage destination for the database files that HiCommand Suite
Common Component will use. At least 1.2 GB of free space is required. (Default
/var/opt/HiCommand/Base/database) >
```

Notes:

– The following characters can be used in the directory name: A-Z, a-z, 0-9, periods (.), and underscores (_).

– Confirm that there is at least 1.2 GB of free space in the specified directory.

13. A message for selecting the size of the HiRDB database appears. Select the desired size (**Small**, **Medium**, or **Large**) based on the number of resources to be monitored by Tuning Manager. For details on the database size to be selected when installing Tuning Manager, see Appendix D including Table D.2.

```
Depending on the number of handled resource, choose a scale for the database from the
following. Choose a scale that is equal to or larger than the scale specified for the previous
installation.
Small : Up to 2,000 resources. At least 1.0 GB of free space is required.
Medium : Up to 5,000 resources. At least 1.0 GB of free space is required.
Large : Up to 8,000 resources. At least 2.5 GB of free space is required.
(Default 2) 1 - Small  2 - Medium  3 - Large 1/2/3 >
```

Note: If Device Manager has already been installed on the same machine, do not select **Large**.

14. A message appears in which you enter the destination for creating the database files that Tuning Manager uses. Enter the destination for creating the files.

```
Specify the storage destination for the database files that HiCommand Tuning
Manager will use. At least 1.0GB of free space is required. (The first
data-storage folder.) (Default /opt/HiCommand/TuningManager/data/rd) >
```

Note: The following characters can be used in the directory name: A-Z, a-z, 0-9, periods (.), and underscores (_).

15. A response message displaying the specified settings appears. Type Y to continue with the installation (or type N to abandon the installation).

```
Current Settings ---------------------------------
Database Settings
        HiCommand Suite Common Component Data Area : /var/opt/HiCommand/Base/database
        Scale : small
        Data Area : /opt/HiCommand/TuningManager/data/rd
        Enhanced Data Area :
------------------------------------------------

Above settings are right? If you specify 'Y' , Data Copy start.
If you specify 'N' , You try Setting again. Y/N > Y
```

When the installation of Server Part 2 finishes, a completion message is displayed:

```
Done installing HiCommand Tuning Manager - Server Part 2
```

3.2.1.1 Checking Shared Memory and Kernel Parameter Values

If an attempt to install Tuning Manager fails and the following message appears, a kernel parameter value might be incorrect, or shared memory might be insufficient:

```
api-ERROR-8044: The /opt/HiCommand/Base/bin/hcmdsdbsetup command returned the error code 255.
```

To take action for the above error:

1. Check whether the KFPO00107-E, KFPO0113-E, KFPO0114-E, or KFPH23005-E message has been output to syslog.
   - If the message has been output:

     An error occurred when shared memory for the operating system was being allocated. Go to step 2.
   - If the message has not been output:

     Go to step 3.
2. Check the required amount of memory installed on the server on which you want to install Tuning Manager.

   The memory requirements for Tuning Manager depend on the size of the database. For details about the memory requirements, see Table D.2 or Table D.4 in Appendix D.
   - If the amount of memory installed is greater than or equal to the memory requirements:

     Go to step 3.
   - If the amount of memory installed is less than the memory requirements:

     Revise the database size or increase the amount of memory. To reduce the database size, uninstall Tuning Manager and then reinstall it. For details on how to uninstall Tuning Manager, see Chapter 8.
3. Check the values of the kernel parameters in `/etc/system`.
   - If the value of a kernel parameter is incorrect:

     Check and, if necessary, correct the value of the kernel parameter, and then go to step 4.
   - If the values of the kernel parameters are correct:

     A fragmentation error may have occurred in shared memory. Execute the following command to restart the server, and then go to step 4:

     ```
     shutdown -y -i6 -g0
     ```

     If the problem persists after you restart the server, see the chapter about troubleshooting in the *HiCommand Tuning Manager Server Administration Guide*.
4. Repair Tuning Manager.

   During the repair, the following message appears, asking you whether you want to delete or save the contents of the existing database:

```
Do you want to preserve your current database? If you choose NO, all Existing
data will be lost.
To preserve, enter Y. Y/N >N
```

In response to this message, type N to delete the contents of the existing database.

For details on how to repair Tuning Manager, see 3.2.2.

5. If you cannot correct the problem by performing steps 1 to 4, free space in the swap area may be insufficient. Make sure that the swap area has sufficient free space. If the free space is insufficient, delete unnecessary files or increase the swap area.

3.2.2 Repair Installation on a Solaris Host

3.2.2.1 Using Server Part 1 for a Repair Installation

To repair components originally installed from Server Part 1:

1. Stop all HiCommand services for Tuning Manager. For details on how to stop the Device Manager-related services, see the *HiCommand Device Manager Server Installation and Configuration Guide.*
2. Log in to the host as root or use the su command to obtain root privileges in your current login session.
3. Insert the installation CD into your CD-ROM drive.
4. Start the installer on the installation CD. This procedure assumes the CD is mounted in the /cdrom/cdrom0 directory:

```
/cdrom/cdrom0/ServerPart1/install-ServerPart1.sh
```

The following message appears:

```
WARNING: The kernel parameters must be set before installing HiCommand Tuning Manager.
If the kernel parameters have not been set, enter n to cancel installation.
If the kernel parameters have been set, enter y to continue installation.
Have the kernel parameters for HiCommand Tuning Manager been set? Y/N >
```

5. Check the values of the kernel parameters (operating system parameters) set in /etc/system in Solaris. If the values are correct, type Y to continue with the installation. If the kernel parameters have not been set or have incorrect values, type N to abort the installation. Then, set the correct values for the kernel parameters in /etc/system, and then re-install Server Part 1.

   For details on the settings of the kernel parameters, see Appendix F.1.

6. When you type Y, the following message appears:

```
Begin Repair of HiCommand Tuning Manager Server Part 1 installation
Do you wish to start the installation?
To continue, enter Y. (Default Y) Y/N >
```

7. Type Y to continue with the repair installation. To abort the repair installation, type N.

   A message appears, recommending that you back up the databases for the HiCommand Suite Common Component and HiCommand Suite products.

```
If other HiCommand Suite products have already been installed, it is strongly
```

```
recommended that you back up the HiCommand Common Component database, and
also the database of each HiCommand Suite product.
To continue, enter Y. (Default Y) Y/N >
```

8. If no version 4.0 or later HiCommand product has been installed, or if the backup has already been created, type `Y` to continue with the installation. To abort the installation, type `N`.

   Once the Server Part1 repair installation has finished normally, the following message will be displayed.

```
Done installing HiCommand Tuning Manager - Server Part 1
```

3.2.2.2 Using Server Part 2 for a Repair Installation

To repair the components originally installed from Server Part 2:

1. Stop all HiCommand-related services for Tuning Manager.

   For details on how to stop the Device Manager-related services, see the *HiCommand Device Manager Server Installation and Configuration Guide.*

2. Insert the installation CD into your CD-ROM drive, if you have not already done so.

3. Start the installer on the installation CD. This procedure assumes that the CD is mounted in the `/cdrom/cdrom0` directory:

```
/cdrom/cdrom0/ServerPart2/install-ServerPart2.sh
```

   The following message appears:

```
WARNING: The kernel parameters must be set before installing HiCommand Tuning Manager.
If the kernel parameters have not been set, enter n to cancel installation.
If the kernel parameters have been set, enter y to continue installation.
Have the kernel parameters for HiCommand Tuning Manager been set? Y/N >
```

4. Check the values of the kernel parameters (operating system parameters) set in `/etc/system` in Solaris. If the values are correct, type `Y` to continue with the installation. If the kernel parameters have not been set or have incorrect values, type `N` to abort the installation. Then, set the correct values for the kernel parameters in `/etc/system` and then perform the installation of Server Part 2.

   For details on the settings of the kernel parameters, see Appendix F.1.

   When you type `Y`, the following message appears:

```
Begin Repair of the HiCommand Tuning Manager Server Part 2 installation
Do you wish to start the installation?
To continue, enter Y. (Default Y) Y/N >
```

5. Type `Y` to continue with the repair installation. To abort the repair installation, type `N`.

   A message appears, recommending that you back up the databases for HiCommand Suite Common Component and the HiCommand Suite product.

```
```

```
If other HiCommand Suite products have already been installed, it is strongly
recommended that you back up the HiCommand Common Component database, and
also the database of each HiCommand Suite product.
To continue, enter Y. (Default Y) Y/N >
```

6. If HiCommand Suite product version 4.0 or later has not been installed, or if the backup has already been created, type `Y` to continue with the repair installation. To abort the repair installation, type `N`.

   A message appears in which you specify the directory to which the user-defined files are to be backed up.

```
Specify a directory to backup user-specific files
```

7. Specify the directory to which the user-defined files are to be backed up.

   Note: The following characters can be used in the directory name: `A-Z`, `a-z`, `0-9`, periods (`.`), and underscores (`_`).

   A message for selecting whether the existing database contents are inherited appears.

```
Do you want to preserve your current database? If you choose No, all existing data will be
lost.
To preserve, enter Y. Y/N >
```

   If you type `Y`, the existing database contents are retained. If you type `N`, the existing database is deleted.

   - If you type `Y` and database migration from InterBase to HiRDB has not finished, go to step 8.
   - If you type `Y` and database migration from InterBase to HiRDB has finished, go to step 11.
   - If you type `N`, go to step 11.

8. A message appears prompting you to specify the directory to which the database is to be backed up.

```
Specify a directory to backup previous database
Required disk space is **** KB:
```

   Note: `****` indicates the free disk space required to back up the database.

9. Specify the directory to which the database is to be backed up.

   When data migration from InterBase to HiRDB is required, a message is displayed for choosing whether the existing database contents are to be migrated during the installation, or whether the contents are to be migrated after the installation by using the database migration command (`htm-db-convert`).

```
To use the new version of HiCommand Tuning manager, the database currently being used must
 be converted Database conversion might take a long time.
select the data conversion method from the following:
1)Convert the database during installation.
2)Convert the database after installation finishes, by using the database conversion
command.
To Convert the database during installation, enter 1. (Default 1) 1/2 >
```

If database migration is not required, this message is not displayed.

10. Type `1` if you want to migrate the database during the installation. If you type `2`, you need to migrate the database after the installation by using the database migration command (`htm-db-convert`), because the database is not migrated during the installation.

11. If you typed `N` in step 7, or if the size of the HiRDB database has been set to **Small** or **Medium**, a message appears prompting you to select the size. Enter the value (1, 2, 3) for the corresponding size.

    The size you enter depends on the number of resources. For details on the size to be selected, see Appendix D including Table D.3. If you do not save the contents of the database, you can select a size smaller than the size of the current database.

```
Depending on the number of handled resource, choose a scale for the database from the
following. Choose a scale that is equal to or larger than the scale specified for the previous
installation.
Small : Up to 2,000 resources. At least 1.0 GB of free space is required.
Medium : Up to 5,000 resources. At least 1.0 GB of free space is required.
Large : Up to 8,000 resources. At least 2.5 GB of free space is required.
(Default 2) 1 - Small  2 - Medium  3 - Large 1/2/3 >
```

    Note:

    If Device Manager has already been installed on the same machine, do not select **Large**.

12. If you typed `N` in step 7, or if the size of the HiRDB database has been changed from **Small** or **Medium** to **Large**, a message appears prompting you to enter the destination for creating the database files that Tuning Manager uses. Enter the destination directory for creating the files.

```
Specify the storage destination for the database files that HiCommand Tuning Manager will
use. At least 1.0GB of free space is required. (The enhanced data-storage folder.)
The first data-storage folder is "/opt/HiCommand/TuningManager/data/rd" (Default
/opt/HiCommand/TuningManager/data/rd) >
```

    Notes:

    - Make sure that the specified directory has enough free space: more than that displayed in the message.
    - The following characters can be used in the directory name: `A-Z`, `a-z`, `0-9`, periods (`.`), and underscores (_).

    A message displaying the specified settings appears.

```
Current Settings ---------------------------------
Preserve Settings
        Current Database : preserve
        Data convert :
Database Settings
        HiCommand Suite Common Component Data Area :
        Scale : medium
        Data Area : /opt/HiCommand/TuningManager/data/rd
        Enhanced Data Area :
-------------------------------------------------

Above settings are right? If you specify 'Y' , Data Copy start.
If you specify 'N' , You try Setting again. Y/N >
```

13. Type `Y` to continue with the installation (or type `N` to re-specify the settings).
14. If you typed `1` in step 9, database migration is performed. If the InterBase service is not running, a message appears before the database migration starts.

    Start the InterBase service, and then type `Y`.

```
InterBase is not running.
InterBase must be running to execute the database conversion.
/etc/init.d/interbaseserver start
To continue installation, execute the above command and then enter Y. (Default Y) Y/N >
```

    When the Server Part 2 repair installation finishes, the following completion message is displayed:

```
Done repairing HiCommand Tuning Manager - Server Part 2
```

3.2.3 Upgrading on a Solaris Host

Before upgrading Tuning Manager:

- Back up the Tuning Manager database.
- Stop the HiCommand-related services.

For details, see the manual for the existing Tuning Manager.

To use Server Part 1 for an upgrade installation:

1. Log in to the host as `root` or use the `su` command to obtain root privileges in your current login session.
2. Stop all HiCommand-related services.
3. Insert the installation CD into your CD-ROM drive.
4. Start the installer on the installation CD. This procedure assumes that the CD is mounted in the `/cdrom/cdrom0` directory

```
/cdrom/cdrom0/ServerPart1/install-ServerPart1.sh
```

    The installer prompts:

```
WARNING: The kernel parameters must be set before installing HiCommand Tuning Manager.
If the kernel parameters have not been set, enter n to cancel installation.
If the kernel parameters have been set, enter y to continue installation.
Have the kernel parameters for HiCommand Tuning Manager been set? Y/N >
```

5. Check the values of the kernel parameters (operating system parameters) set in `/etc/system` in Solaris. If the values are correct, type `Y` to continue with the installation. If the kernel parameters have not been set or have incorrect values, type `N` to abort the installation. Then, set the correct values for the kernel parameters in `/etc/system` and perform the installation of Server Part 1 again.

    For details on the settings of the kernel parameters, see Appendix F.1.

6. When you type Y, the following message appears.

```
Begin Upgrade of the HiCommand Tuning Manager Server Part 1 installation
Do you wish to start the installation?
To continue, enter Y. (Default Y) Y/N >
```

7. Type Y to start the installation. To abort the installation, type N.

   A message appears, recommending that you back up the databases for HiCommand Suite Common Component and the HiCommand Suite product.

```
If other HiCommand Suite products have already been installed, it is strongly recommended
that you back up the HiCommand Common Component database, and also the database of each
HiCommand Suite product.
To continue, enter Y. (Default Y) Y/N >
```

8. If a version 4.0 or later HiCommand Suite product that uses HiCommand Suite Common Component has not been installed, or if the backup has already been created, type Y to continue with the installation. To abort the installation, type N.

   When the Server Part 1 upgrade installation completes normally, the following message will be displayed.

```
Done installing HiCommand Tuning Manager - Server Part 1
To complete installation, install HiCommand Tuning Manager - Server Part 2 next
```

   Proceed with the upgrade installation of Server Part 2.

9. Start the installer on the installation CD. This procedure assumes that the CD is mounted in the /cdrom/cdrom0 directory:

```
/cdrom/cdrom0/ServerPart2/install-ServerPart2.sh
```

   The following message appears:

```
WARNING: The kernel parameters must be set before installing HiCommand Tuning Manager.
If the kernel parameters have not been set, enter n to cancel installation.
If the kernel parameters have been set, enter y to continue installation.
Have the kernel parameters for HiCommand Tuning Manager been set? Y/N >
```

10. Check the values of the kernel parameters (operating system parameters) set in /etc/system in Solaris. If the values are correct, type Y to continue with the installation. If the kernel parameters have not been set or have incorrect values, type N to abort the installation. Then, set the correct values for the kernel parameters in /etc/system and perform the installation of Server Part 2 again.

    For details on the settings of the kernel parameters, see Appendix F.1.

11. When you type Y, the following message appears.

```
Begin Upgrade of HiCommand Tuning Manager Server Part 2 installation
Do you wish to start the installation?
To continue, enter Y. (Default Y) Y/N >
```

12. Type Y to continue the installation. To abort the installation, type N.

A message appears, recommending that you back up the databases for HiCommand Suite Common Component and the HiCommand Suite product.

```
If other HiCommand Suite products have already been installed, it is strongly recommended
that you back up the HiCommand Common Component database, and also the database of each
HiCommand Suite product.
To continue, enter Y. (Default Y) Y/N >
```

13. If a version 4.0 or later HiCommand Suite product that uses HiCommand Suite Common Component has not been installed, or if the backup has already been created, type `Y` to continue with the installation. To abort the installation, type `N`.

    A message appears prompting you to specify the directory to which the user-defined files are to be backed up.

```
Specify a directory to backup user-specific files
```

14. Specify the directory to which the user-defined files are to be backed up.

    Note: The following characters can be used in the directory name: `A-Z`, `a-z`, `0-9`, periods (`.`), and underscores (_).

    A response message for selecting whether the existing database contents are inherited appears.

```
Do you want to preserve your current database? If you choose No, all existing data will be
lost.
To preserve, enter Y. Y/N >
```

    If you type `Y`, the existing database contents are not deleted. If you type `N`, the existing database is deleted.

    - If you type `Y` and database migration from InterBase to HiRDB has not finished, go to step 15.
    - If you type `Y` and database migration from InterBase to HiRDB has finished, go to step 18.
    - If you type `N`, go to step 18.

15. A message for specifying the directory to which the database is to be backed up appears.

```
Specify a directory to backup previous database
Required disk space is **** KB:
```

    Note: `****` indicates the free disk space required to back up the database.

16. Specify the directory to which the database is to be backed up.

    Note: The following characters can be used in the directory name: `A-Z`, `a-z`, `0-9`, periods (`.`), and underscores (_).

    When data migration from InterBase to HiRDB is required, a message is displayed in which you choose whether the existing database contents are to be migrated during the installation, or whether the contents are to be migrated after the installation by using the database migration command (`htm-db-convert`).

```
To use the new version of HiCommand Tuning manager, the database currently being used must
be converted Database conversion might take a long time.
```

```
select the data conversion method from the following:
1)Convert the database during installation.
2)Convert the database after installation finishes, by using the database conversion
command.
To Convert the database during installation, enter 1. (Default 1) 1/2 >
```

If database migration is not required, this message is not displayed.

17. Type `1` to migrate the database during the installation or type `2` to migrate the database after the installation by using the database migration command (`htm-db-convert`).

18. When you are performing an upgrade installation from v3.5 or earlier, a message appears in which you select the destination for creating the database files that HiCommand Suite Common Component uses. However, if other HiCommand Suite products (v4.0 or later) are installed on the same machine, the message does not appear.

```
Specify the storage destination for the database files that HiCommand Suite Common Component
will use. At least 1.2 GB of free space is required. (Default
/var/opt/HiCommand/Base/database) >
```

Notes:

- The following characters can be used in the directory name: `A-Z`, `a-z`, `0-9`, periods (`.`), underscores (_), and space characters.
- Confirm that there is at least 1.2 GB of free space in the directory.

19. When you are performing an upgrade installation from version 3.5 or earlier, if you typed `N` in step 14, or if the size of the database has been changed from **Small** to **Medium** on version 4.0 or later, a message appears prompting you to select the size of the HiRDB database. Enter the value (1, 2, 3) for the corresponding size.

    The size you select depends on the number of resources. For details on the size to be selected, see Appendix D, Table D.4, or Table D.5. If you do not save the contents of the database, you can select a size smaller than the size of the current database.

```
Depending on the number of handled resource, choose a scale for the database from the
following. Choose a scale that is equal to or larger than the scale specified for the previous
installation.
Small : Up to 2,000 resources. At least 1.0 GB of free space is required.
Medium : Up to 5,000 resources. At least 1.0 GB of free space is required.
Large : Up to 8,000 resources. At least 2.5 GB of free space is required.
(Default 2) 1 - Small  2 - Medium  3 - Large 1/2/3 >
```

Note:

If Device Manager has already been installed on the same machine, do not select **Large**.

20. When you are performing an upgrade installation from version 3.5 or earlier, if you typed `N` in step 14, or if the size of the database has been changed from **Small** or **Medium** to **Large** in step 19, a message appears prompting you to enter the destination for creating the database files that Tuning Manager uses. Enter the destination directory for creating the files.

    - When the upgrade installation is from version 3.5 or earlier:

```
Specify the storage destination for the database files that HiCommand Tuning Manager
will use. At least 2.0GB of free space is required. (The first data-storage folder.)
(Default /opt/HiCommand/TuningManager/data/rd) >
```

– When you typed `N` in step 14, or when, in the upgrade installation from version 4.0 or later, the size of the HiRDB database is changed from **Small** or **Medium** to **Large**:

```
Specify the storage destination for the database files that HiCommand Tuning Manager
will use. At least 1.0GB of free space is required. (The enhanced data-storage folder.)
The first data-storage folder is "/opt/HiCommand/TuningManager/data/rd" (Default
/opt/HiCommand/TuningManager/data/rd) >
```

Notes:

– Make sure that the specified directory has enough free space: more than that displayed in the message.

– The following characters can be used in the directory name: `A-Z`, `a-z`, `0-9`, periods (`.`), underscores (_), and space characters.

A message displaying the specified settings appears.

```
Current Settings ---------------------------------
Preserve Settings
        Current Database : preserve
        Data convert : Convert the database during installation
Database Settings
        HiCommand Suite Common Component Data Area : /var/opt/HiCommand/Base/database
        Scale : small
        Data Area : /opt/HiCommand/TuningManager/data/rd
        Enhanced Data Area :
-------------------------------------------------

Above settings are right? If you specify 'Y' , Data Copy start.
If you specify 'N' , You try Setting again. Y/N >
```

21. Type `Y` to continue the installation (or type `N` to re-specify the settings).

22. If you typed `1` in step 16, database migration is performed. If the InterBase service is not running, a message appears before the database migration starts.

    Start the InterBase service, and then type `Y`.

```
InterBase is not running.
InterBase must be running to execute the database conversion.
/etc/init.d/interbaseserver start
To continue installation, execute the above command and then enter Y. (Default Y) Y/N >
```

When the Server Part 2 installation finishes normally, the following completion message is displayed:

```
Done upgrading HiCommand Tuning Manager - Server Part 2
```

3.2.4 Performance Reporter Configurations

Performance Reporter is installed and uninstalled as part of the overall Tuning Manager installation and uninstallation.

The installation directory for Performance Reporter is:

```
/opt/HiCommand/TuningManager/PerformanceReporter/
```

Table 3.3 shows the locations of the Performance Reporter files. Table 3.4 shows the locations of the `war` files, which are stored in the `webapps` directory.

Table 3.3 Locations of the Performance Reporter Files

Description	File or Directory Names
Uninstaller file	/opt/HiCommand/TuningManager/PerformanceReporter/uninstall
Uninstaller response file	/opt/HiCommand/TuningManager/PerformanceReporter/dontask
Log output directory	/opt/HiCommand/TuningManager/PerformanceReporter/log/
Command directory	/opt/HiCommand/TuningManager/PerformanceReporter/tools/
Command file	/opt/HiCommand/TuningManager/PerformanceReporter/tools/*
Library, internal command directory	/opt/HiCommand/TuningManager/PerformanceReporter/lib/
Library, internal command file	/opt/HiCommand/TuningManager/PerformanceReporter/lib/*.jar
	/opt/HiCommand/TuningManager/PerformanceReporter/lib/*.so
config file directory	/opt/HiCommand/TuningManager/PerformanceReporter/conf/
config file	/opt/HiCommand/TuningManager/PerformanceReporter/conf/config.xml
config DTD file	/opt/HiCommand/TuningManager/PerformanceReporter/conf/config.dtd
Display message resource file	/opt/HiCommand/TuningManager/PerformanceReporter/conf/DispMessages.xml
Log message resource file	/opt/HiCommand/TuningManager/PerformanceReporter/conf/LogMessages.xml
Message DTD file	/opt/HiCommand/TuningManager/PerformanceReporter/conf/Messages.dtd
DTD file for commands	/opt/HiCommand/TuningManager/PerformanceReporter/conf/*.dtd
Storage file for build number	/opt/HiCommand/TuningManager/PerformanceReporter/conf/build
System property file	/opt/HiCommand/TuningManager/PerformanceReporter/conf/pr.properties
Storage directory for agent setup files	/opt/HiCommand/TuningManager/PerformanceReporter/setup/
Storage directory for war file	/opt/HiCommand/TuningManager/PerformanceReporter/webapps/
War file	/opt/HiCommand/TuningManager/PerformanceReporter/webapps/PerformanceReporter.war
Storage directory for manual	/opt/HiCommand/TuningManager/PerformanceReporter/docs/
Manual HTML file	/opt/HiCommand/TuningManager/PerformanceReporter/docs/*.htm

Description	File or Directory Names
Storage directory for manual images	/opt/HiCommand/TuningManager/PerformanceReporter/docs/figure/
Manual image file	/opt/HiCommand/TuningManager/PerformanceReporter/docs/figure/*.gif
Storage directory for sample files	/opt/HiCommand/TuningManager/PerformanceReporter/sample/
Storage directory for original file of config.xml	/opt/HiCommand/TuningManager/PerformanceReporter/sample/conf/
Original config.xml file	/opt/HiCommand/TuningManager/PerformanceReporter/sample/conf/config.xml
Storage directory for resource file	/opt/HiCommand/TuningManager/PerformanceReporter/resources/
Storage directory for data model file	/opt/HiCommand/TuningManager/PerformanceReporter/resources/descriptions/
Data model file	/opt/HiCommand/TuningManager/PerformanceReporter/resources/descriptions/*.dat
Storage directory for bookmarks	/opt/HiCommand/TuningManager/PerformanceReporter/bookmarks/

Table 3.4 war File Contents

Description	File and Directory Names
Webapps directory	/opt/HiCommand/HiCommand/Base/CC/web/containers/PerformanceReporter/webapps/PerformanceReporter
JSP file	/opt/HiCommand/HiCommand/Base/CC/web/containers/PerformanceReporter/webapps/PerformanceReporter/jsp/pr*.jsp
Image file	/opt/HiCommand/HiCommand/Base/CC/web/containers/PerformanceReporter/webapps/PerformanceReporter/images/*.gif
Agent icon file	/opt/HiCommand/HiCommand/Base/CC/web/containers/PerformanceReporter/webapps/PerformanceReporter/images/products/*.gif
Java Script file	/opt/HiCommand/HiCommand/Base/CC/web/containers/PerformanceReporter/webapps/PerformanceReporter/scripts/*.js
MANIFEST file	/opt/HiCommand/HiCommand/Base/CC/web/containers/PerformanceReporter/webapps/PerformanceReporter/META-INF/MANIFEST.MF
Style sheet file	/opt/HiCommand/HiCommand/Base/CC/web/containers/PerformanceReporter/webapps/PerformanceReporter/css/*.css
web.xml file	/opt/HiCommand/HiCommand/Base/CC/web/containers/PerformanceReporter/webapps/PerformanceReporter/WEB-INF/web.xml
struts-config.xml file	/opt/HiCommand/HiCommand/Base/CC/web/containers/PerformanceReporter/webapps/PerformanceReporter/WEB-INF/struts-config.xml
Tag library file	/opt/HiCommand/HiCommand/Base/CC/web/containers/PerformanceReporter/webapps/PerformanceReporter/WEB-INF/*.tld
Library JAR file	/opt/HiCommand/HiCommand/Base/CC/web/containers/PerformanceReport

Description	File and Directory Names
	er/webapps/PerformanceReporter/WEB-INF/lib/*.jar
Resource file	/opt/HiCommand/HiCommand/Base/CC/web/containers/PerformanceReporter/webapps/PerformanceReporter/WEB-INF/class/*.properties
Class file for the PR.form package	/opt/HiCommand/HiCommand/Base/CC/web/containers/PerformanceReporter/webapps/PerformanceReporter/WEB-INF/com/hitachi/truenorth/HiCommand/PR/form/*.class
Class file for the PR.servlets package	/opt/HiCommand/HiCommand/Base/CC/web/containers/PerformanceReporter/webapps/PerformanceReporter/WEB-INF/com/hitachi/truenorth/HiCommand/PR/servlets/*.class

3.3 Operating in a Cluster System

This section describes how to set up Tuning Manager in a cluster system. For details about the items that need to be checked before setting up Tuning Manager in a cluster system, see Chapter 2.

3.3.1 Setting up Tuning Manager in a Cluster System

This section describes the setup procedure for configuring Tuning Manager as a cluster system. It assumes that Tuning Manager has been installed on all of the hosts in the cluster configuration.

3.3.1.1 Environment Settings for Collection Manager

The following procedure describes how to specify the environment settings for Collection Manager on both the executing node and the standby node. For details about the commands used for the environment settings for Collection Manager, see the *HiCommand Tuning Manager Command Line Interface Guide*.

Note: Tuning Manager uses the `JPC_HOSTNAME` environment variable. Thus, do not set `JPC_HOSTNAME` as an environment variable. If you set it by mistake, Tuning Manager cannot work properly.

To specify environment settings on the executing node:

1. Place the shared disk online or mount the shared disk.
2. Set up a logical host environment for Collection Manager.

   Execute the `jpchasetup create` command to create a logical host environment for Collection Manager. Executing the command copies necessary data into the shared disk and sets definitions for the logical host to create a logical host environment.

   To set up the logical host environment for Collection Manager:

   a) Execute the `jpchasetup create` command to create a logical host environment for Collection Manager.

      Execute the command as follows:

      ```
      jpchasetup create mgr -lhost tm1-ha1 -d S:\tm1
      ```

      Specify the logical host name by using the `-lhost` option. In the example above, the logical host name is `tm1-ha1`. If DNS is used, specify the logical host name without specifying the domain name.

      Specify the directory of the shared disk following the `-d` environment directory option. For example, specifying `-d S:\tm1` creates `S:\tm1\jp1pc` and places the logical host environment files in it.

   b) Execute the `jpchasetup list` command and check the logical host settings.

      Execute the command as follows:

```
jpchasetup list all
```

Check whether the created logical host environment is correct.

3. Set up the logical host environment for an Agent.

   If you are going to set up an Agent in the logical host where you have set up Collection Manager, set it up at this stage.

   For details about the setup procedure, see Chapter 7.

4. Set up the port numbers.

   Set the port numbers only when using Tuning Manager in a network environment with a firewall. To let Tuning Manager communicate through the firewall, set the port numbers by using the `jpcnsconfig port` command. For details on how to set port numbers, see section 6.4.

   For example, to set all service port numbers on the logical host `tm1-ha1` to fixed numbers, execute the command as follows:

   ```
   jpcnsconfig port define all -lhost tm1-ha1
   ```

   Executing the `jpcnsconfig` command adds port numbers and service names (TCP service names that begin with `jp1pc` by default) used by Tuning Manager into the `services` file.

5. Set the IP addresses.

   If you wish to specify the IP addresses to be used when using Tuning Manager in a network environment with multiple LAN connections, you must set the IP addresses. To do this, edit the `jpchosts` file directly.

   For details on how to set an IP address, see section 6.5.

   Note: If you edit the `jpchosts` file, copy the `jpchosts` file on the executing node to the standby node.

6. Export the logical host environment definitions.

   After setting up the logical host environment for Collection Manager, export the environment definitions to a file. Export all the Collection Manager definitions and Agent definitions set up for the logical host to a file. When setting up another Agent in the same logical host, export the Agent definitions after the setup procedure.

   To export the logical host environment definitions:

   Execute the `jpchasetup export` command to export the logical host environment definitions: Export the logical host environment definitions that you have set up to a file. You can use any name for the exported file.

   For example, to export logical host environment definitions to the file `lhostexp.txt`, execute the command as follows:

   ```
   jpchasetup export -f lhostexp.txt
   ```

7. Copy the logical host environment definitions file to the standby node.

   Copy the logical host environment definitions file you exported in step 6 above, from the executing node to the standby node.

To specify environment settings on the standby node:

1. Import the logical host environment definitions (import the definitions file you copied from the executing node to the standby node).

   To apply the Collection Manager environment definitions you created for the executing node to the standby node, use the `jpchasetup import` command.

   If this command is executed, the shared disk does not need to be placed online.

2. Execute the `jpchasetup import` command to import the logical host environment definitions.

   Execute the command as follows:

   ```
   jpchasetup import -f lhostexp.txt
   ```

   Executing this command changes the setting of the standby node environment in accordance with the exported file. This change allows Collection Manager to start up in the logical host.

   If you have executed the `jpcnsconfig port` command to set up fixed port numbers, the port numbers are also set in the standby node.

3. Execute the `jpchasetup list` command and check the logical host settings.

   Execute the command as follows:

   ```
   jpchasetup list all
   ```

   Make sure that the results of this command are the same as the results of `jpchasetup list` executed on the executing node.

3.3.1.2 Environment Settings for Performance Reporter

For details on the environment settings for a Performance Reporter cluster system, see section 3.3.10.

3.3.1.3 Environment Settings for Tuning Manager

The following describes how to set an environment for Tuning Manager.

Notes:

- The installation destination for HiCommand Suite Common Component must be the same on both the executing node and the standby node.
- The storage destination for the database used by HiCommand Suite Common Component and Tuning Manager must be created on a local disk.

To set an environment for Tuning Manager:

1. Enter a license key on both the executing node and the standby node.
2. On both the executing node and the standby node, specify the information for setting a cluster configuration, in the cluster control file (`cluster.conf`).

   Create the `cluster.conf` file as the cluster control file, in the following location. If the file already exists, a cluster configuration might be set for other HiCommand Suite products. Check the contents of the file, and use it as it is.

In Windows:

HiCommand-Suite-Common-Component-installation-folder\conf\cluster.conf

In Solaris:

/opt/HiCommand/Base/conf/cluster.conf

In the cluster control file, specify the contents as follows.

```
mode =: Specify online (executing node) or standby (standby node).
virtualhost =: Specify the logical host name.
onlinehost =: Specify the host name of the executing node.
standbyhost =: Specify the host name of the standby node.
```

Note: You cannot use an IP address to specify the logical host names and host names of the executing and standby nodes in the cluster.conf file.

Also, logical host names to be specified in virtualhost must have a corresponding IP address that is valid and accessible.

3. Stop HiCommand Suite Common Component on both the executing node and the standby node.

   Execute the following command.

   In Windows:

   HiCommand-Suite-Common-Component-installation-folder\bin\hcmdssrv /stop

   In Solaris:

   /opt/HiCommand/Base/bin/hcmdssrv -stop

4. Start the database on both the executing node and the standby node.

   Execute the following command.

   In Windows:

   HiCommand-Suite-Common-Component-installation-folder\bin\hcmdsdbsrv /start

   In Solaris:

   /opt/HiCommand/Base/bin/hcmdsdbsrv -start

5. Move the database to a shared disk. Re-create the database on a shared disk on both the executing node and the standby node.

   Windows:

   On the executing node, execute the following command to move the database to a shared disk:

   HiCommand-Suite-Common-Component-installation-folder\bin\hcmdsdbcluster setup /createcluster /databasepath *database-re-creation-destination-folder* /exportpath *data-storage-folder*

   On the standby node, execute the following command to change the settings so that the database system on a shared disk can be referenced:

   HiCommand-Suite-Common-Component-installation-folder\bin\hcmdsdbremake /cluster /databasepath *database-re-creation-destination-folder*

   Notes:

   – Delete or empty *data-storage-folder* before executing the command.

- Specify a path for *database-re-creation-destination-folder* and *data-storage-folder* using no more than 63 bytes.
- Place *database-re-creation-destination-folder* on a shared disk. Place *data-storage-folder* on a local disk.
- When executing the command on the standby node, specify the same folder as that specified for *database-re-creation-destination-folder* on the executing node.
- The characters shown below can be used in *database-re-creation-destination-folder* and *data-storage-folder*. In addition, you can use a backslash (\), swung dash (~), or forward slash (/) as a path delimiter.

  A-Z, a-z, 0-9, periods (.), and underscores (_)
- When the hcmdsdbremake command or the hcmdsdbclustersetup command is executed, the value set for the port number that is used by HiRDB (the embedded database) returns to the default value (23032). If the value was changed to a value other than the default value, reset the port number after executing the command.

Solaris:

On the executing node, execute the following command:

/opt/HiCommand/Base/bin/hcmdsdbclustersetup -createcluster -databasepath *database-re-creation-destination-directory* -exportpath *data-storage-directory*

On the standby node, execute the following command:

/opt/HiCommand/Base/bin/hcmdsdbremake -cluster -databasepath *database-re-creation-destination-directory*

Notes:

- Delete or empty *data-storage-directory* before executing the command.
- Specify a path for *database-re-creation-destination-directory* and *data-storage-directory* using no more than 63 bytes.

  A path delimiter character (a forward slash (/)) cannot be used as the end character for *database-re-creation-destination-directory* and *data-storage-directory*.
- Place *database-re-creation-destination-directory* on a shared disk. Place *data-storage-directory* on a local disk.
- If the shared disk and the logical host are registered for the cluster service, make each resource available from the executing node.
- When executing the command on the standby node, specify the same directory as that specified for *database-re-creation-destination-directory* on the executing node.
- The characters shown below can be used for *database-re-creation-destination-directory* and *data-storage-directory*. In addition, you can use a forward slash (/) as a path delimiter. However, you cannot use space characters in a path.

  A-Z, a-z, 0-9, periods (.), and underscores (_)
- When the hcmdsdbremake command or the hcmdsdbclustersetup command is executed, the value set for the port number that is used by HiRDB (the embedded database) returns to the default value (23032). If the value was changed to a value other than the default value, reset the port number after executing the command.

6. Stop HiCommand Suite Common Component on both the executing node and the standby node. Execute the following command:

   Windows:

   HiCommand-Suite-Common-Component-installation-folder\bin\hcmdssrv /stop

   Solaris:

   ```
   /opt/HiCommand/Base/bin/hcmdssrv -stop
   ```

7. On both the executing node and the standby node, change the setting for starting the service from automatic to manual.

   In a cluster configuration, to execute the service from the cluster software, the startup settings of the following services must be set to manual:

   - HBase Storage Mgmt Web Service
   - HiCommand Performance Reporter
   - HiCommand Suite TuningManager
   - HiCommand Suite TuningService
   - HiRDB/ClusterService _HD0

   To set the startup of these services to manual, execute the following command:

   Windows:

   HiCommand-Suite-Common-Component-installation-folder\bin\hcmdssrv /starttype manual /all

   Solaris:

   ```
   /opt/HiCommand/Base/bin/hcmdssrv -starttype manual -all
   ```

3.3.2 Linking with MSCS

When Tuning Manager runs in a cluster configuration, settings must be specified so that Tuning Manager is linked with MSCS, and MSCS controls the starting and stopping of Tuning Manager.

For details on how to register Tuning Manager in MSCS, see the MSCS documentation.

3.3.2.1 Before Registering Tuning Manager in the Cluster Software

Notes:

- If other HiCommand Suite products have already been registered in the cluster software, use that cluster group.
- Before registration, stop the services that are to be registered in the cluster software.

Before registering Tuning Manager in MSCS, perform the following operations:

1. Create a resource group and set resources.

   Display Cluster Administrator.

   Select **Start**, **Settings**, **Control Panel**, **Administrative Tools**, and then **Cluster Administrator**.

2. Create a resource group in which to register the Tuning Manager service. If there is an existing group to which HiCommand Suite products have been registered, select that group.

   Note: Use only resources related to HiCommand Suite products to configure the resource group.

3. Select **IP address** in **Resource Type** and register the logical host IP address to a resource group.
4. Select **Network name** in **Resource type** to register the logical host to a resource group.
5. Select **Physical disk** in **Resource type** to register the shared disk to a resource group.
6. Register each resource in MSCS. For details on how to register resources, see section 3.3.2.2.

3.3.2.2 Registering Collection Manager

The following describes the settings required when registering Collection Manager in MSCS.

If Collection Manager and an agent are running on the same logical host, you must register the agent in MSCS. For details on how to do this, see Chapter 7.

Table 3.5 lists the services to be registered in the cluster when registering Collection Manager.

Table 3.5 Collection Manager Services to be Registered in MSCS

No	Name	Service Name	Dependency
1-1	PFM - Name Server [*lhost*]	JP1PCMGR_PN [*lhost*]	IP address resource Physical disk resource
1-2	PFM - Master Manager [*lhost*]	JP1PCMGR_PM [*lhost*]	Cluster resource (#1-1)
1-3	PFM - Master Store [*lhost*]	JP1PCMGR_PS [*lhost*]	Cluster resource (#1-2)
1-4	PFM - View Server [*lhost*]	JP1PCMGR_PP [*lhost*]	Cluster resource (#1-5)
1-5	PFM - Correlator [*lhost*]	JP1PCMGR_PE [*lhost*]	Cluster resource (#1-3)
1-6	PFM - Trap Generator [*lhost*]	JP1PCMGR_PC [*lhost*]	Cluster resource (#1-5)
1-7	PFM - Action Handler [*lhost*]	JP1PCMGR_PH [*lhost*]	Cluster resource (#1-3)

Replace the *lhost* portion with a logical host name. For example, if the logical host name is `tm1-ha1`, set `PFM - Name Server [tm1-ha1]` for the name of the service and `JP1PCMGR_PN [tm1-ha1]` for the service name.

In MSCS, register these services as MSCS resources. Set up the resources as described below. The bold words and phrases indicate items to be set for MSCS.

- Set *general-purpose service* for **Resource Type**.
- Make sure that both the executing node and the standby node are added to **Possible Owners**.
- Set **Name**, **Dependency**, and **Service Name** in accordance with Table 3.5.

  Name is used to display the name of the service, and **Service Name** is used to specify the service to be controlled from MSCS.
- Ignore **Startup Parameter** and **Duplicate Registry**.
- Specify the items on the **Details** page for Properties according to whether Collection Manager needs to fail over if an error occurs in it.

  For example, when Collection Manager needs to fail over if an error occurs in it, select (add a checkmark to) **Restart** and **Apply to Group,** and then set `3` (as a general estimate) in **Threshold** for the restart retry count.

Note: The services registered in the cluster software are started and stopped by the cluster software, thus set **Startup Type** to **Manual** for the services so that they do not automatically start when the OS starts. When you set them up using the `jpchasetup create` command, the command sets their startup types to **Manual**. In addition, do not use the following command to perform a forced stop:

`jpcstop all lhost=`*`logical-host-name`* `kill=immediate`

3.3.2.3 Registering HiRDB

Register the services shown in Table 3.6 into the cluster group where Collection Manager has been registered.

Notes:

- Register the services into the cluster group on the executing node only.
- Before registering HiRDB, register Collection Manager in MSCS.
- If HiRDB has already been registered in the cluster software during setup of the cluster system for other HiCommand Suite products, you do not need to register HiRDB.

Table 3.6 Settings When Registering HiRDB

Number	Name	Service Name	Dependency	Startup Parameter
2-1	HiRDB	`HiRDBClusterService_HD0`	Physical disk resource IP address resource Network name	None

Common settings for each resource:

- Set *general-purpose service* for **Resource Type**.
- Make sure that both the executing node and the standby node are added to **Possible Owners**.
- Ignore **Duplicate Registry**.
- Select (add a checkmark to) **Restart** in the **Details** page.
- Set `3` (as a general estimate) in **Threshold** for the restart retry count.

3.3.2.4 Registering Performance Reporter

Register the services shown in Table 3.7 into the cluster group where Collection Manager has been registered.

Notes:

- Register the services into the cluster group on the executing node only.
- Before registering Performance Reporter, register HiRDB in MSCS.

Table 3.7 Settings When Registering Performance Reporter

Number	Name	Service Name	Dependency	Startup Parameter
3-1	HBase Storage Mgmt Web Service	`HBaseStgMgmtWebService`	Cluster resource (#2-1)	`--ntservice` (The two hyphens(`--`) are required.)
3-2	HiCommand Performance Reporter	`PerformanceReporter`	Cluster resource (#3-1)	`-s PerformanceReporter`

Common settings for each resource:

- Set *general-purpose service* for **Resource Type**.
- Make sure that both the executing node and the standby node are added to **Possible Owners**.
- Set **Pending Timeout** in the **Details** page in accordance with the specification of the machine to be used. The recommended value is `300` seconds.
- Ignore **Duplicate Registry**.
- Select (add a checkmark to) **Restart** in the **Details** page.
- Set `3` (as a general estimate) in **Threshold** for the restart retry count.

3.3.2.5 Registering Tuning Manager

Register the services shown in Table 3.8 into the cluster group where Collection Manager has been registered, so that Tuning Manager can start and stop from MSCS.

Notes:

- Register the services into the cluster group on the executing node only.
- Before registering Tuning Manager, register Performance Reporter in MSCS.
- If you will not be using the SOAP communication, you do not need to register HiCommand Suite TuningService.

Table 3.8 Settings When Registering Tuning Manager

Number	Name	Service Name	Dependency	Startup Parameter
4-1	HiCommand Suite TuningManager	`HiCommandTuningManager`	Cluster resource (#3-1)	`-s TuningManager`
4-2	HiCommand Suite TuningService	`HiCommandTuningService`	Cluster resource (#3-1)	`-s TuningService`

Common settings for each resource:

- Set *general-purpose service* for **Resource Type**.
- Make sure that both the executing node and the standby node are added to **Possible Owners**.
- Ignore **Duplicate Registry**.
- Select (add a checkmark to) **Restart** in the **Details** page.
- Set 3 (as a general estimate) in **Threshold** for the restart retry count.

3.3.2.6 Unmounting Groups

After registering all resources, in Cluster Administrator, place the group for which the Tuning Manager service is registered offline.

3.3.3 Linking with Sun Cluster

To run Tuning Manager in a cluster configuration, settings must be specified so that Tuning Manager links with Sun Cluster, and Sun Cluster controls the starting and stopping of Tuning Manager.

3.3.3.1 Before Registering Tuning Manager in the Cluster Software

Before registering Tuning Manager in the cluster software, you must create script files for controlling Tuning Manager from the cluster software.

Notes:

- Create script files both on the executing node and the standby node.
- If you will not be using SOAP communication, you do not need to create script files.
- If you are using HiCommand Tuning Manager in VERITAS Cluster Server, you do not need to create a script file for HiRDB.

The necessary script files are as follows:

- The control script file for Collection Manager
- The control script file for HiRDB
- The control script file for HiCommand Suite Common Component
- The control script file for Performance Reporter
- The control script file for Tuning Manager
- The control script file for Tuning Service

Appendix G contains examples for each script file, which you can customize for your environment. Note that the samples listed in *Appendix G* are script files for Sun Cluster. If you are using Tuning Manager in VERITAS Cluster Server, change each script file as follows.

Before changes:

```
ALIVE_VALUE=0
DOWN_VALUE=1
```

After changes:

```
ALIVE_VALUE=110
DOWN_VALUE=100
```

The following describes how to set the control commands (startup, stop and operation monitoring) listed in the script, and how to create these commands.

Notes:

- You do not need to set or create the control commands for HiRDB.
- Create the control commands both on the executing node and the standby node.

Control Commands for Collection Manager

The control commands for Collection Manager must be set in the script file, as shown in Table 3.9.

Table 3.9 How to Control Collection Manager Registered in the Cluster Software

Item	Description
Startup	Execute the following commands, in the order given, to start Collection Manager: `/opt/jp1pc/tools/jpcstart mgr lhost=`*`logical-host-name`* `/opt/jp1pc/tools/jpcstart act lhost=`*`logical-host-name`* Start up Collection Manager after the shared disk and logical IP address become usable.

Item	Description
Stop	Execute the following commands, in the order given, to stop Collection Manager: `/opt/jp1pc/tools/jpcstop act lhost=`*logical-host-name* `/opt/jp1pc/tools/jpcstop mgr lhost=`*logical-host-name* Stop Collection Manager before the shared disk and logical IP address become unusable. Note that the `jpcstop` command returns `3` if its services are stopping due to an error or failure. However, for this item, the return value `3` is regarded as a value that indicates a successful completion because the services have been stopped. If you use the cluster software to check the status of Collection Manager according to a return value of the `jpcstop` command, make the command return `0` if the services are stopping.
Operation Monitoring	Execute the following `ps` command to check that the process is running: `ps -ef | grep "`*process-name logical-host-name*`" | grep -v "grep `*monitored-process*`"` For details on process names, see the *HiCommand Tuning Manager Agent Administration Guide*. In addition, assuming that Collection Manager will sometimes temporarily stop (for maintenance for example), we recommend that you prepare measures to suppress operation monitoring (e.g., do not monitor when there exists a file that indicates that maintenance is being performed).
Forced Stop	Execute the following command to perform a forced stop: `/opt/jp1pc/tools/jpcstop all lhost=`*logical-host-name* `kill=immediate` Only `all` can be specified in the service key of the first argument. *Note*: Executing this command forcibly stops all Collection Manager and Agent processes running in the specified logical host environment by sending SIGKILL. SIGKILL forcibly stops Collection Manager and Agent processes in units of logical hosts, and not in units of services. Specify settings so that a forced stop is performed only if the usual stop commands have no effect.

Notes:

- The cluster software controls the starting and stopping of Collection Manager registered in the cluster software. Thus, do not set up Collection Manager so that it automatically starts when the OS starts.
- When the cluster software uses return values of Collection Manager commands to determine the results of the executed commands, adjust the return values of the commands to those that the cluster software expects to receive. For details on the return values of Collection Manager commands, see the chapter that describes the commands in the *HiCommand Tuning Manager Command Line Interface Guide*.
- The `jpcstop` command forcibly stops Collection Manager in units of logical hosts, and not in units of services. Note that this command does not forcibly stop Collection Manager for each service.
- To perform a forced stop, execute the following:

  ```
  jpcstop all lhost=logical-host-name kill=immediate
  ```

- The number of characters displayed by the `ps` command depends on the OS. Make sure that the number of characters in the displayed string, including the logical host name and instance name, does not exceed 47. In addition, to monitor operations by using the `ps` command, execute the `ps` command to check whether all logical hosts are displayed in advance. If not all logical hosts are displayed, specify the settings so that the displayed items are monitored.

Control Command for HiCommand Suite Common Component

Execute the following command to copy the command for controlling HiCommand Suite Common Component (`/etc/rc3.d/S99hicommand-CWS`) to a location recognized by the cluster software and save it under another name.

```
cp -p /etc/rc3.d/S99hicommand-CWS /etc/init.d/cluster_hicommand-CWS
```

Control Command for Performance Reporter

Execute the following command to copy the command for controlling Performance Reporter (`/etc/rc3.d/S99hicommand-PR`) to a location recognized by the cluster software and save it under another name.

```
cp -p /etc/rc3.d/S99hicommand-PR /etc/init.d/cluster_hicommand-PR
```

Control Command for Tuning Manager

Execute the following command to copy the command for controlling Tuning Manager (`/etc/rc3.d/S99hicommand-TM`) to a location recognized by the cluster software and save it under another name.

```
cp -p /etc/rc3.d/S99hicommand-TM /etc/init.d/cluster_hicommand-TM
```

Control Command for Tuning Service

Execute the following command to copy the command for controlling Tuning Service (`/etc/rc3.d/S99hicommand-TS`) to a location recognized by the cluster software and save it under another name.

```
cp -p /etc/rc3.d/S99hicommand-TS /etc/init.d/cluster_hicommand-TS
```

3.3.3.2 Registering Resources in the Cluster Software

The following describes the procedure for registering resources in the cluster software.

Notes:

- Before registering resources in the cluster software, perform the operations described in section 3.3.3.1.
- In this procedure, the script files created in section 3.3.3.1 are assumed to have been stored in `/etc/init.d/`.
- Register resources on the executing node only.

1. Create a resource group if there is no resource group to which other HiCommand Suite products have been registered. If there is an existing group to which other HiCommand Suite products have been registered, use that group.

   Specify the following values for the parameters in the `scrgadm` command.

   - Group name: `HiCommand`
   - Node: *host-name-for-the-executing-node-and-the-standby-node*

   The following is an example of the command to be executed:

   `# /usr/cluster/bin/scrgadm -a -g HiCommand -h` *host-name-of-the-executing-node-or-the-standby-node*

   Note: Use only resources related to HiCommand Suite products to configure the resource group.

2. Register a shared disk as a resource.

   Specify the following values for the parameters in the `scrgadm` command.

   - Resource type: `SUNW.HAStoragePlus`
   - Resource name: `SharedDisk`

3. Register the logical host name as a resource.

   Specify the following value for the parameter in the `scrgadm` command.

   - Resource name: `htnm_ip`

4. Register Collection Manager as a resource.

   Specify the values in Table 3.10 for the parameters in the `scrgadm` command.

Table 3.10 Settings for Registering Collection Manager as a Resource

Dialog Name	Value
Resource type	`SUNW.gds`
Resource name	`Collection Manager` (any name)
Related network	`htnm_ip`
Dependent resource	`SharedDisk`

Command for starting the service	/etc/init.d/hicommand-CM.sh start
Command for stopping the service	/etc/init.d/hicommand-CM.sh stop
Command for monitoring the service	/etc/init.d/hicommand-CM.sh check
Port number to be used	23032/tcp

The following is an example of the command to be executed:

```
# scrgadm -a -j CollectionManager -t SUNW.gds -g HiCommand
-y Scalable=false
-y Port_list="23032/tcp"
-x Start_command="/etc/init.d/hicommand-CM.sh start"
-x Stop_command="/etc/init.d/hicommand-CM.sh stop"
-x Probe_command="/etc/init.d/hicommand-CM.sh check"
-y NetWork_resources_used=htnm_ip
-y Resource_dependencies= SharedDisk
-x Failover_enabled="true"
-y Retry_count=0
```

5. Register HiRDB as a resource.

   Specify the values in Table 3.11 for the parameters in the `scrgadm` command.

Table 3.11 Settings for Registering HiRDB as a Resource

Dialog Name	Value
Resource type	SUNW.gds
Resource name	HiRDB (any name)
Related network	htnm_ip
Dependent resource	SharedDisk
Command for starting the service	/etc/init.d/hirdb_start.sh
Command for stopping the service	/etc/init.d/hirdb_stop.sh
Command for monitoring the service	/etc/init.d/hirdb_probe.sh
Port number to be used	23032/tcp

The following is an example of the command to be executed:

```
# scrgadm -a -j HiRDB -t SUNW.gds -g HiCommand
-y Scalable=false
-y Port_list="23032/tcp"
-x Start_command="/etc/init.d/hirdb_start.sh"
-x Stop_command="/etc/init.d/hirdb_stop.sh"
-x Probe_command="/etc/init.d/hirdb_probe.sh"
-y NetWork_resources_used=htnm_ip
-y Resource_dependencies= SharedDisk
-x Failover_enabled="true"
-y Retry_count=0
```

6. Register HiCommand Suite Common Component as a resource.

   Specify the values in Table 3.12 for the parameters in the `scrgadm` command.

Table 3.12 Settings for Registering HiCommand Suite Common Component as a Resource

Dialog Name	Value
Resource type	`SUNW.gds`
Resource name	`CommonWebService` (any name)
Related network	`htnm_ip`
Dependent resource	`HiRDB`
Command for starting the service	`/etc/init.d/hicommand-CWS.sh start`
Command for stopping the service	`/etc/init.d/hicommand-CWS.sh stop`
Command for monitoring the service	`/etc/init.d/hicommand-CWS.sh check`
Port number to be used	`23032/tcp`

The following is an example of the command to be executed:

```
# scrgadm -a -j CommonWebService -t SUNW.gds -g HiCommand
-y Scalable=false
-y Port_list="23032/tcp"
-x Start_command="/etc/init.d/hicommand-CWS.sh start"
-x Stop_command="/etc/init.d/hicommand-CWS.sh stop"
-x Probe_command="/etc/init.d/hicommand-CWS.sh check"
-y NetWork_resources_used=htnm_ip
-y Resource_dependencies= HiRDB
-x Failover_enabled="true"
-y Retry_count=0
```

7. Register Tuning Manager as a resource.

   Specify the values in Table 3.13 for the parameters in the `scrgadm` command.

Table 3.13 Settings for Registering Tuning Manager as a Resource

Dialog Name	Value
Resource type	`SUNW.gds`
Resource name	`TuningManager` (any name)
Related network	`htnm_ip`
Dependent resource	`CommonWebService`
Command for starting the service	`/etc/init.d/hicommand-TM.sh start`
Command for stopping the service	`/etc/init.d/hicommand-TM.sh stop`
Command for monitoring the service	`/etc/init.d/hicommand-TM.sh check`
Port number to be used	`23032/tcp`

The following is an example of the command to be executed:

```
# scrgadm -a -j TuningManager -t SUNW.gds -g HiCommand
-y Scalable=false
-y Port_list="23032/tcp"
-x Start_command="/etc/init.d/hicommand-TM.sh start"
-x Stop_command="/etc/init.d/hicommand-TM.sh stop"
-x Probe_command="/etc/init.d/hicommand-TM.sh check"
-y NetWork_resources_used=htnm_ip
-y Resource_dependencies=CommonWebService
-x Failover_enabled="true"
-y Retry_count=0
```

8. Register Performance Reporter as a resource.

   Specify the values in Table 3.14 for the parameters in the `scrgadm` command.

Table 3.14 Settings for Registering Performance Reporter as a Resource

Dialog Name	Value
Resource type	`SUNW.gds`
Resource name	`PerformanceReporter` (any name)
Related network	`htnm_ip`
Dependent resource	`CommonWebService`
Command for starting the service	`/etc/init.d/hicommand-PR.sh start`
Command for stopping the service	`/etc/init.d/hicommand-PR.sh stop`
Command for monitoring the service	`/etc/init.d/hicommand-PR.sh check`
Port number to be used	`23032/tcp`

The following is an example of the command to be executed:

```
# scrgadm -a -j PerformanceReporter -t SUNW.gds -g HiCommand
-y Scalable=false
-y Port_list="23032/tcp"
-x Start_command="/etc/init.d/hicommand-PR.sh start"
-x Stop_command="/etc/init.d/hicommand-PR.sh stop"
-x Probe_command="/etc/init.d/hicommand-PR.sh check"
-y NetWork_resources_used=htnm_ip
-y Resource_dependencies=CommonWebService
-x Failover_enabled="true"
-y Retry_count=0
```

9. Register Tuning Service as a resource.

   Specify the values in Table 3.15 for the parameters in the `scrgadm` command.

   Note: If you will not be using the SOAP communication, you do not need to register the Tuning Service service.

Table 3.15 Settings for Registering Tuning Service as a Resource

Dialog Name	Value
Resource type	`SUNW.gds`
Resource name	`TuningService` (any name)
Related network	`htnm_ip`

Dialog Name	Value
Dependent resource	CommonWebService
Command for starting the service	/etc/init.d/hicommand-TS.sh start
Command for stopping the service	/etc/init.d/hicommand-TS.sh stop
Command for monitoring the service	/etc/init.d/hicommand-TS.sh check
Port number to be used	23032/tcp

Following is an example of the command to be executed:

```
# scrgadm -a -j TuningService -t SUNW.gds -g HiCommand
-y Scalable=false
-y Port_list="23032/tcp"
-x Start_command="/etc/init.d/hicommand-TS.sh start"
-x Stop_command="/etc/init.d/hicommand-TS.sh stop"
-x Probe_command="/etc/init.d/hicommand-TS.sh check"
-y NetWork_resources_used=htnm_ip
-y Resource_dependencies=CommonWebService
-x Failover_enabled="true"
-y Retry_count=0
```

3.3.4 Linking with VERITAS Cluster Server

To run Tuning Manager in a cluster configuration, settings must be specified so that Tuning Manager links with VERITAS Cluster Server, and VERITAS Cluster Server controls the starting and stopping of Tuning Manager.

The following describes the procedure for registering resources in the cluster software.

Notes:

- Before registering resources in the cluster software, perform the operations described in section 3.3.3.1.
- In this procedure, the script files created in section 3.3.3.1 are assumed to have been stored in /etc/init.d/.
- Register resources on the executing node only.
- If HiRDB has already been registered in the cluster software during setup of the cluster system for other HiCommand Suite products, you do not need to specify settings related to HiRDB.

1. Create the dummy file for monitoring the HiRDB service from VERITAS Cluster Server.

   Create the following file.

   File name: /opt/HiCommand/Base/HDB/.pdveritas

   Details: This is an empty file.

2. Create the script that defines the resource types for the HiRDB service.

   Create the following file.

   File name: /etc/VRTSvcs/conf/config/HiRDB_Stypes.cf

   Details: Create a file containing the following:

```
Type HiRDB_S (
static str ArgList[] = { PdDir, PdConfPath, Ld_Library_Path, DummyFilePath }
str PdDirstr
str  PdConfPathstr
str  Ld_Library_Pathstr
str  DummyFilePath
)
```

3. Define the agent for HiRDB.

   Execute the following command:

```
# mkdir /opt/VRTSvcs/bin/HiRDB_S
# cp /opt/VRTSvcs/bin/ScriptAgent /opt/VRTSvcs/bin/HiRDB_S/HiRDB_SAgent
```

4. Start VERITAS Cluster Manager.
5. Make the settings file for VERITAS Cluster Server editable. Select **Open Configuration** from the **File** menu.
6. Import the file created in step 2. From the **File** menu, choose **Import Types**.
7. Select the following file, and then choose **Import**.

```
/etc/VRTSvcs/conf/config/HiRDB_STypes.cf
```

8. If there is no group to which other HiCommand Suite products have been registered, create the resource group. If there is an existing group to which other HiCommand Suite products have been registered, use that group.

   From the **Edit** menu, choose **Add** and then **Service Group**.

   Note: Use only resources related to HiCommand Suite products to configure the resource group.

9. In **Service Group Name**, enter `HiCommand`.
10. Move both the executing node and the standby node from **Available Systems** to **Systems for Service Group**.
11. Select **OK**.
12. Register the IP address.

    In the dialog box for adding new resources, from **Resource Type**, choose **IP**, and then register the IP address (cluster management IP address) used to access Tuning Manager.

13. Register a shared disk in the HiCommand group.

    In the dialog box for adding new resources, from **Resource Type**, choose **Disk Reservation** to register device files on the shared disk. For the resource name, enter `SharedDisk`.

14. Register a mount point for the shared disk.

    In the dialog box for adding new resources, from **Resource Type**, choose **Mount** to register the mount point for the shared disk. For the resource name, enter `MountPoint`.

15. In the **Edit** menu, choose **Add** and then **Resource**, and display the **Add Resource** dialog.
16. Register the services used by Tuning Manager as resources.

    Register the following services:

    – Collection Manager

- HiRDB
- HiCommand Suite Common Component
- Performance Reporter service
- Tuning Manager service
- Tuning Service service

Note: If you will not be using the SOAP communication, you do not need to register the HiCommand Suite Tuning Service service.

The following tables list the settings for registering each service as a resource.

Table 3.16 Settings for Registering Collection Manager as a Resource

Dialog Name	Setting
Resource Name	Name: `CollectionManager` (any name)
Resource Type	`Application`
Start Program attribute	`Scalar Values:/etc/init.d/hicommand-CWS start`
Stop Program attribute	`Scalar Values:/etc/init.d/hicommand-CWS stop`
Clean Program attribute	`Scalar Values:/etc/init.d/hicommand-CWS stop`
Monitor Program attribute	`Scalar Values:/etc/init.d/hicommand-CWS check`

Table 3.17 Settings for Registering HiRDB as a Resource

Dialog Name	Setting
Resource Name	Name: `HiRDB` (any name)
Resource Type	`HiRDB_S`
PdDir	`/opt/HiCommand/Base/HDB`
Pdconfpath	`/opt/HiCommand/Base/HDB/conf`
Ld_Library_Path	`/opt/HiCommand/Base/HDB/lib`
DummyFilePath	`/opt/HiCommand/Base/HDB/.pdveritas`
Critical	`false`

Table 3.18 Settings for Registering HiCommand Suite Common Component as a Resource

Dialog Name	Setting
Resource Name	CommonWebService
Resource Type	Application
Start Program attribute	Scalar Values:/etc/init.d/hicommand-CWS start
Stop Program attribute	Scalar Values:/etc/init.d/hicommand-CWS stop
Clean Program attribute	Scalar Values:/etc/init.d/hicommand-CWS stop
Monitor Program attribute	Scalar Values:/etc/init.d/hicommand-CWS check

Table 3.19 Settings for Registering Performance Reporter as a Resource

Dialog Name	Setting
Resource Name	PerformanceReporter
Resource Type	Application
Start Program attribute	Scalar Values:/etc/init.d/hicommand-PR start
Stop Program attribute	Scalar Values:/etc/init.d/hicommand-PR stop
Clean Program attribute	Scalar Values:/etc/init.d/hicommand-PR stop
Monitor Program attribute	Scalar Values:/etc/init.d/hicommand-PR check

Table 3.20 Settings for Registering Tuning Manager as a Resource

Dialog Name	Setting
Resource Name	TuningManager
Resource Type	Application
Start Program attribute	Scalar Values:/etc/init.d/hicommand-TM start
Stop Program attribute	Scalar Values:/etc/init.d/hicommand-TM stop
Clean Program attribute	Scalar Values:/etc/init.d/hicommand-TM stop
Monitor Program attribute	Scalar Values:/etc/init.d/hicommand-TM check

Table 3.21 Settings for Registering Tuning Service as a Resource

Dialog Name	Setting
Resource Name	`TuningService`
Resource Type	`Application`
Start Program attribute	`Scalar Values:/etc/init.d/hicommand-TS start`
Stop Program attribute	`Scalar Values:/etc/init.d/hicommand-TS stop`
Clean Program attribute	`Scalar Values:/etc/init.d/hicommand-TS stop`
Monitor Program attribute	`Scalar Values:/etc/init.d/hicommand-TS check`

17. Set the dependencies for each resource.

    Table 3.22 lists the dependencies for each resource.

Table 3.22 Dependency for Each Resource

Resource	Dependent Resource
Collection Manager	Mount point for a shared disk IP address
HiRDB	Mount point for a shared disk IP address
HBase Storage Mgmt Web Service	HiRDB
HiCommand Performance Reporter	HBase Storage Mgmt Web Service
HiCommand Suite TuningManager	HBase Storage Mgmt Web Service
HiCommand Suite TuningService	HBase Storage Mgmt Web Service

18. Save the changes in the settings file for VERITAS Cluster Server.

    From the **File** menu, choose **Save Configuration**.

19. Close the settings file for VERITAS Cluster Server.

    From the **File** menu, choose **Close Configuration**.

20. Enable the registered resource, and close VERITAS Cluster Manager.

3.3.5 Adding an Agent

3.3.5.1 When Using Collection Manager

For details on how to set up a new Agent in Collection Manager, see section 6.8.

3.3.5.2 When Using Performance Reporter

When adding a new Agent, the `jpcpragtsetup` command must be executed because an Agent icon and description file for metrics must be set in Performance Reporter. Execute the `jpcpragtsetup` command on both the executing node and the standby node. For details on this command, see the *HiCommand Tuning Manager Command Line Interface Guide*.

After executing the `jpcpragtsetup` command, restart the Performance Reporter service on the executing node from the cluster software. If another method is used to restart the Performance Reporter service, the cluster software might detect an error because the information managed by the cluster software will conflict with the service status.

On the standby node, the service starts for the first time when failover occurs. The Agent information is read when the service starts. Thus, the service does not need to be restarted when you add an Agent for a new product.

If you are adding a new Agent instance, from the cluster software, you must restart Performance Reporter on the executing node to recognize the Agent instance that was added. If another method is used to restart the Performance Reporter service, the cluster software might detect an error because the information managed by the cluster software will conflict with the service status.

On the standby node, the service starts for the first time when failover occurs. The Agent information is read when the service starts. Thus, the service does not need to be restarted when you add an Agent for a new product.

3.3.6 Deleting an Agent

3.3.6.1 When Using Collection Manager

To release the connection between an Agent and Collection Manager on a cluster system, execute the `jpcctrl delete` command with the logical host specified in the `-lhost` option. For details about the `jpcctrl delete` command and about how to delete an Agent in Collection Manager, see the *HiCommand Tuning Manager Command Line Interface Guide*.

3.3.6.2 When Using Performance Reporter

From the cluster software, you must restart Performance Reporter on the executing node to recognize the deleted Agent. If another method is used to restart the Performance Reporter service, the cluster software might detect an error because the information managed by the cluster software will conflict with the service status.

On the standby node, the service starts when failover occurs. The Agent information is read when the service starts. As a result, the service does not need to be restarted when you delete an Agent.

3.3.6.3 When Using Tuning Manager

When deleting an Agent, after deleting the Agent instance from Collection Manager, select **Administrator** and **Available Agents**, and then click the displayed **Refresh** button. This will delete the Agent from the list of available Tuning Manager Agents.

In the Available Agents list displayed by choosing **Available Agents** and then **Administrator**, even if you select the Agent you want to delete and click the **Remove** button below the agent list, you cannot end the connection between the Agent and Tuning Manager. `web-ERROR-3001` appears in Tuning Manager as a result of this operation.

3.3.7 Settings for Running Tuning Manager in Single Sign-on Mode

This section explains the setup procedure to run Tuning Manager in single sign-on mode.

Before setting up Tuning Manager, set up Device Manager and HiCommand Suite Common Component.

For details on running Device Manager in a cluster environment, see the *HiCommand Device Manager Server Installation and Configuration Guide*.

3.3.7.1 Running Tuning Manager and Device Manager on the Same Node

The following explains the required operations when running Tuning Manager and Device Manager on the same node.

Registering the Services in the Cluster Software

Register the following services in the group where Tuning Manager and Performance Reporter have been registered:

- Single Sign On Service
- HiCommandServer

For details on how to register the services, see the *HiCommand Device Manager Server Installation and Configuration Guide*.

Setting up Single Sign-on Mode in Tuning Manager

Set up single sign-on mode in Tuning Manager. For details on how to set up, see the section that describes how to switch to single sign-on mode in the *HiCommand Tuning Manager Server Administration Guide*.

Note: Single sign-on mode must be set up on all of the nodes in a cluster system. Perform the following operations on the executing node:

- Register the Device Manager environment
- Register the startup URL for Tuning Manager

3.3.7.2 Running Tuning Manager and Device Manager on Different Nodes

The following explains the required operations when running Tuning Manager and Device Manager on different nodes.

Setting up Single Sign-on Mode in Tuning Manager

Set up single sign-on mode in Tuning Manager. For details on how to set up, see the section that describes how to switch to single sign-on mode in the *HiCommand Tuning Manager Server Administration Guide*.

Note: Single sign-on mode must be set up on all of the nodes in a cluster system. Perform the following operations on the executing node:

- Register the Device Manager environment
- Register the startup URL for Tuning Manager

3.3.8 Installing and Repairing an Installation when other HiCommand Suite Products Exist (Windows)

3.3.8.1 Repair Installation

This section explains how to repair Tuning Manager by installing the same version of the product in a system configured in a cluster environment.

Notes:

- Migration from a cluster configuration to a non-cluster configuration is not supported. To migrate Tuning Manager from a cluster configuration to a non-cluster configuration, uninstall Tuning Manager, and then install it again.
- If the services on the executing node are not online, place them online, and then repair Tuning Manager.
- Before you repair Tuning Manager running in single sign-on mode, switch to standalone mode and then repair Tuning Manager. For details on how to switch to standalone mode, see the *HiCommand Tuning Manager Server Administration Guide*.

Repairing Tuning Manager on the Executing Node

To repair Tuning Manager:

1. Remove the cluster group for the Tuning Manager service and the services of the prerequisite program products for Tuning Manager from the cluster management target.
   - Use Cluster Administrator to place the services offline.
   - In Cluster Administrator, right-click the service, and then choose **Properties** and then the **Advanced** tab. Select the **Do not restart** option, and then click **OK**.

   You must place the following services offline:
   - Collection Manager
   - HiCommand Tuning Manager
   - HiCommand Tuning Service
   - HBase Storage Mgmt Web Service
   - HiCommand Performance Reporter
   - HiRDB/ClusterService _HD0
2. Stop HiCommand Suite Common Component.

   Execute the following command:

   HiCommand-Suite-Common-Component-installation-folder`\bin\hcmdsrv /stop`
3. Repair Tuning Manager (see section 3.1.2).
4. Change the automatic service startup to manual startup.

In a cluster configuration, the cluster software executes the service. Execute the following command so that the HiCommand Suite Common Component service does not start automatically when the machine starts:

HiCommand-Suite-Common-Component-installation-folder\bin\hcmdssrv /starttype manual /all

5. Stop Tuning Manager and HiCommand Suite Common Component.

   Execute the following command:

   HiCommand-Suite-Common-Component-installation-folder\bin\hcmdssrv /stop

6. Switch the group for which the Tuning Manager service has been registered to the standby node.

   In Cluster Administrator, right-click the group for which the Tuning Manager service has been registered, and then choose **Move Group**.

Repairing Tuning Manager on the Standby Node

To repair Tuning Manager:

1. Stop Tuning Manager and HiCommand Suite Common Component.

   Execute the following command:

   HiCommand-Suite-Common-Component-installation-folder\bin\hcmdssrv /stop

2. Repair Tuning Manager (see section 3.1.2).

3. Stop Tuning Manager and HiCommand Suite Common Component.

   Execute the following command:

   HiCommand-Suite-Common-Component-installation-folder\bin\hcmdsdbsrv /stop

4. Change the automatic service startup to manual startup.

   In a cluster configuration, the cluster software executes the service. Execute the following command so that the HiCommand Suite Common Component service does not start automatically when the machine starts:

   HiCommand-Suite-Common-Component-installation-folder\bin\hcmdssrv /starttype manual /all

5. In Cluster Administrator, right-click each of the following services, and choose **Properties** and then the **Advanced** tab. Select the **Restart** option, and then click **OK**.

   Place the following services online:

   - HiCommand Tuning Manager
   - HiCommand Tuning Service
   - HBase Storage Mgmt Web Service
   - HiCommand Performance Reporter
   - HiRDB/ClusterService _HD0

6. On the executing node, place the group for which the Tuning Manager service has been registered online.

3.3.8.2 Installing when other HiCommand Suite Products Exists

This section explains how to install or upgrade Tuning Manager on a host where other HiCommand Suite products (version 4.0 or later) are configured in a cluster system and are using Tuning Manager version 4.0 or later or HiCommand Suite Common Component.

Notes:

- Before you install Tuning Manager in a cluster system, cancel the cluster configuration for the HiCommand Suite products.
- Before you install Tuning Manager running in single sign-on mode, switch to standalone mode and then install Tuning Manager. For details on how to switch to standalone mode, see the *HiCommand Tuning Manager Server Administration Guide*.
- To upgrade Tuning Manager, after the services stop, use the `jpchasetup` command to cancel the Collection Manager cluster configuration. For details on the `jpchasetup` command, see the *HiCommand Tuning Manager Command Line Interface Guide*.

To install Tuning Manager:

1. Remove the services of the HiCommand Suite products and HiRDB from the cluster management target.
   - Use Cluster Administrator to place the services offline.
   - In Cluster Administrator, right-click the service to be set up, and choose **Properties** and then the **Advanced** tab. Select the **Do not restart** option, and then click **OK**.
2. On both the executing node and the standby node, stop all of the HiCommand Suite products.

   For details on how to stop Tuning Manager, see the *HiCommand Tuning Manager Server Administration Guide*.

   For details on how to stop the other HiCommand Suite products, see the relevant manual for each product.
3. On both the executing node and the standby node, stop the HiCommand Suite Common Component service.

   HiCommand-Suite-Common-Component-installation-folder`\bin\hcmdssrv /stop`
4. Use Cluster Administrator to switch the group for which the HiCommand Suite product has been registered to the standby node.

   In Cluster Administrator, right-click the group for which the Tuning Manager service has been registered, and then choose **Move Group**.
5. On the standby node, start the HiRDB service.

   HiCommand-Suite-Common-Component-installation-folder`\bin\hcmdsdbsrv /start`
6. Back up the database (see the *HiCommand Tuning Manager Server Administration Guide*).
7. On the standby node, re-create the database area on the local disk.

   HiCommand-Suite-Common-Component-installation-folder`\bin\hcmdsdbclustersetup /removecluster /databasepath` *database-re-creation-destination-folder* `/exportpath` *data-storage-folder*

Notes:

- Delete or empty *data-storage-folder* before executing the command.
- Specify an absolute path for *database-re-creation-destination-folder* and *data-storage-folder* using no more than 63 bytes. Note that you cannot specify a path delimiter (a backslash (\)) at the end of *database-re-creation-destination-folder* and *data-storage-folder*. If you do so, a command error occurs. If a command error occurs, remove the path delimiter (\), and then re-execute the command.
- Place *database-re-creation-destination-folder* and *data-storage-folder* on a local disk.
- The characters shown below can be used for *database-re-creation-destination-folder* and *data-storage-folder*. In addition, you can use a backslash (\), colon (:), or forward slash (/) as a path delimiter.

  A-Z, a-z, 0-9, periods (.), and underscores (_)
- When the hcmdsdbclustersetup command is executed, the value set for the port number that is used by HiRDB (the embedded database) returns to the default value (23032). If the value was changed to a value other than the default value, reset the port number after executing the command.

8. Back up the database (see the *HiCommand Tuning Manager Server Administration Guide*).
9. Use Cluster Administrator to switch the group for which the HiCommand Suite service has been registered to the executing node.
10. On the executing node, start the HiRDB service.

    HiCommand-Suite-Common-Component-installation-folder\bin\hcmdsdbsrv /start
11. Back up the database (see the *HiCommand Tuning Manager Server Administration Guide*).
12. On the executing node, re-create the database area on the local disk.

    HiCommand-Suite-Common-Component-installation-folder\bin\hcmdsdbclustersetup /removecluster /databasepath *database-re-creation-destination-folder* /exportpath *data-storage-folder*

    Notes:

    - Delete or empty *data-storage-folder* before executing the command.
    - Specify an absolute path for *database-re-creation-destination-folder* and *data-storage-folder* using no more than 63 bytes. Note that you cannot specify a path delimiter (a forward slash (\)) at the end of *database-re-creation-destination-folder* and *data-storage-folder*. If you do so, a command error occurs. If a command error occurs, remove the path delimiter (\), and then re-execute the command.
    - Place *database-re-creation-destination-folder* and *data-storage-folder* on a local disk.
    - The characters shown below can be used for *database-re-creation-destination-folder* and *data-storage-folder*. In addition, you can use a backslash (\), colon (:), or forward slash (/) as a path delimiter.

A-Z, a-z, 0-9, periods (.), and underscores (_)

– When the `hcmdsdbclustersetup` command is executed, the value set for the port number that is used by HiRDB (the embedded database) returns to the default value (23032). If the value was changed to a value other than the default value, reset the port number after executing the command.

13. Back up the database (see the *HiCommand Tuning Manager Server Administration Guide*).
14. Install or upgrade Tuning Manager in accordance with the procedure for setting up the cluster environment. Then, set up the cluster environment.

    For details on the cluster environment settings for other HiCommand Suite products, see the relevant manual for each product.

3.3.9 Installing and Repairing an Installation when other HiCommand Suite Products Exist (Solaris)

3.3.9.1 Repair Installation

This section explains how to repair Tuning Manager by installing the same version of the product in a system configured in a cluster environment.

Notes:

- Migration from a cluster configuration to a non-cluster configuration is not supported. To migrate Tuning Manager from a cluster configuration to a non-cluster configuration, uninstall Tuning Manager, and then install it again.
- If the services on the executing node are not online, place them online, and then repair Tuning Manager.
- Before you repair Tuning Manager running in single sign-on mode, switch to standalone mode and then repair Tuning Manager. For details on how to switch to standalone mode, see the *HiCommand Tuning Manager Server Administration Guide*.

Repairing Tuning Manager on the Executing Node

To repair Tuning Manager:

1. Remove the cluster group for the Tuning Manager service and the services of the prerequisite program products for Tuning Manager from the cluster management target.
   – For VERITAS Cluster Server:
      a) Start VERITAS Cluster Manager.
      b) Place the services of the HiCommand Suite products offline.
      c) Right-click each service of the HiCommand Suite products. In the context menu that appears, clear the **Enabled** selection.
      d) In the Cluster Explorer window, choose the **Service Groups** tab.

e) Select and then right-click the group for which the service of the HiCommand Suite product has been registered. In the context menu that appears, choose **Freeze** and then **Temporary**.

– For Sun Cluster:

a) Disable resource monitoring for each service of the HiCommand Suite product.

```
# /usr/cluster/bin/scswitch -n -M -j resource-name
```

b) Disable the resource for each service of the HiCommand Suite product.

```
# /usr/cluster/bin/scswitch -n  -j resource-name
```

2. Stop HiCommand Suite Common Component.

   Execute the following command:

   ```
   # /opt/HiCommand/Base/bin/hcmdssrv -stop
   ```

3. Repair Tuning Manager (see section 3.2.2).

4. Change the automatic service startup to manual startup.

   In a cluster configuration, the cluster software executes the service. Execute the following command so that the HiCommand Suite Common Component service does not start automatically when the machine starts:

   ```
   # /opt/HiCommand/Base/bin/hcmdssrv -starttype manual -all
   ```

5. Stop Tuning Manager and HiCommand Suite Common Component.

   Execute the following command:

   ```
   # /opt/HiCommand/Base/bin/hcmdssrv -stop
   ```

6. Switch the group for which the Tuning Manager service has been registered to standby.

   – For VERITAS Cluster Server:

   a) In the Cluster Explorer window, choose the **Service Groups** tab.

   b) Select and right-click the group for which the service of the HiCommand Suite product has been registered. In the context menu that appears:

   1. Choose **Unfreeze**.
   2. Choose **Switch To** and then **Host Name**.
   3. Choose **Freeze** and then **Temporary**.

   – For Sun Cluster:

   Execute the following command:

   ```
   # /usr/cluster/bin/scswitch -z -g group-name -h host-name
   ```

Repairing Tuning Manager on the Standby Node

To repair Tuning Manager:

1. Stop Tuning Manager and HiCommand Suite Common Component.

   Execute the following command:

   ```
   # /opt/HiCommand/Base/bin/hcmdssrv -stop
   ```

2. Repair Tuning Manager (see section 3.2.2).
3. Change the automatic service startup to manual startup.

   In a cluster configuration, the cluster software executes the service. Execute the following command so that the HiCommand Suite Common Component service does not start automatically when the machine starts:

   ```
   # /opt/HiCommand/Base/bin/hcmdssrv -starttype manual -all
   ```
4. Stop Tuning Manager and HiCommand Suite Common Component.

   Execute the following command:

   ```
   # /opt/HiCommand/Base/bin/hcmdssrv -stop
   ```
5. Add the Tuning Manager service and the services of the prerequisite program products for Tuning Manager to the management target for the cluster group.
   - For VERITAS Cluster Server:
     a) Start VERITAS Cluster Manager.
     b) In the Cluster Explorer window, choose the **Service Groups** tab.
     c) Select and right-click the group for which the service of the HiCommand Suite product has been registered. In the context menu that appears, choose **UnFreeze**.
     d) Select and right-click the group for which the service of the HiCommand Suite product has been registered. In the context menu that appears, choose **Enabled Resources**.
     e) Save the changes in the VERITAS Cluster Server settings file. From the **File** menu, choose **Save Configuration**.
     f) Close the VERITAS Cluster Server settings file. From the **File** menu, choose **Close Configuration**.
   - For Sun Cluster:
     a) Enable the resource for each service of the HiCommand Suite product.

        ```
        # /usr/cluster/bin/scswitch -e -j resource-name
        ```
     b) Enable resource monitoring for each service of the HiCommand Suite product.

        ```
        # /usr/cluster/bin/scswitch -e -M -j resource-name
        ```
6. Place the group for which the Tuning Manager service has been registered online.

3.3.9.2 Installing when other HiCommand Suite Products Exist

This section explains how to install or upgrade Tuning Manager on a host where other HiCommand Suite products (version 4.0 or later) are configured in a cluster system and are using Tuning Manager version 4.0 or later or HiCommand Suite Common Component.

Notes:

- Before you install Tuning Manager in a cluster system, cancel the cluster configuration for the HiCommand Suite products.
- Before you install Tuning Manager running in single sign-on mode, switch to standalone mode and then install Tuning Manager. For details on how to switch to standalone mode, see the *HiCommand Tuning Manager Server Administration Guide*.
- To upgrade Tuning Manager, after the services stop, use the `jpchasetup` command to cancel the Collection Manager cluster configuration. For details on the `jpchasetup` command, see the *HiCommand Tuning Manager Command Line Interface Guide*.

To install Tuning Manager:

1. Cancel cluster monitoring for the HiCommand Suite product and the HiRDB services.
   - For VERITAS Cluster Server:
     a) Start VERITAS Cluster Manager.
     b) Place the services of the HiCommand Suite products offline.
     c) Right-click each service of the HiCommand Suite products. In the context menu that appears, clear the **Enabled** selection.
     d) In the Cluster Explorer window, choose the **Service Groups** tab. Select and right-click the group for which the service of the HiCommand Suite product has been registered. In the context menu that appears, choose **Freeze** and then **Temporary**.
   - For Sun Cluster:
     a) Disable resource monitoring for each service of the HiCommand Suite product.

        `# /usr/cluster/bin/scswitch -n -M -j` *resource-name*

     b) Disable the resource for each service of the HiCommand Suite product.

        `# /usr/cluster/bin/scswitch -n  -j` *resource-name*
2. On both the executing node and the standby node, stop all of the HiCommand Suite products.

   For details on how to stop Tuning Manager, see the *HiCommand Tuning Manager Server Administration Guide*.

   For details on how to stop the other HiCommand Suite products, see the relevant manual for each product.
3. On both the executing node and the standby node, stop the HiCommand Suite Common Component service.

   ```
   # /opt/HiCommand/Base/bin/hcmdssrv -stop
   ```

4. Switch the group for which the service of the HiCommand Suite product has been registered to the standby node.
   - For VERITAS Cluster Server:
     1. In the Cluster Explorer window, choose the **Service Groups** tab.
     2. Select and right-click the group for which the service of the HiCommand Suite product has been registered. In the context menu that appears:
        1. Choose **Unfreeze**.
        2. Choose **Switch To** and then **Host Name**.
        3. Choose **Freeze** and then **Temporary**.
   - For Sun Cluster:

     Execute the following command:

     `# /usr/cluster/bin/scswitch -z -g` *group-name* `-h` *host-name*
5. On the standby node, start the HiRDB service.

   `# /opt/HiCommand/Base/bin/hcmdsdbsrv -start`
6. Back up the database (see the *HiCommand Tuning Manager Server Administration Guide*).
7. On the standby node, re-create the database area on the local disk.

   `# /opt/HiCommand/Base/bin/hcmdsdbclustersetup -removecluster -databasepath` *database-re-creation-destination-directory* `-exportpath` *data-storage-directory*

   Notes:
   - Delete or empty *data-storage-directory* before executing the command.
   - Specify an absolute path for *database-re-creation-destination-directory* and *data-storage-directory* using no more than 63 bytes. Note that you cannot specify a path delimiter (a forward slash (/)) at the end of *database-re-creation-destination-directory* and *data-storage-directory*. If you do so, a command error occurs. If a command error occurs, remove the path delimiter (/), and then re-execute the command.
   - Place *database-re-creation-destination-directory* and *data-storage-directory* on a local disk.
   - The characters shown below can be used for *database-re-creation-destination-directory* and *data-storage-directory*. In addition, you can use a forward slash (/) as a path delimiter. However, you cannot use space characters in a path.

     `A-Z`, `a-z`, `0-9`, periods (`.`), and underscores (`_`)
   - When the `hcmdsdbclustersetup` command is executed, the value set for the port number that is used by HiRDB (the embedded database) returns to the default value (23032). If the value was changed to a value other than the default value, reset the port number after executing the command.
8. Switch the group for which the service of the HiCommand Suite product has been registered to the executing group.
   - For VERITAS Cluster Server:

In the Cluster Explorer window, choose the **Service Groups** tab. Select and right-click the group for which the service of the HiCommand Suite product has been registered. In the context menu that appears:

1. Choose **Unfreeze**.
2. Choose **Switch To** and then **Host Name**.
3. Choose **Freeze** and then **Temporary**.

– For Sun Cluster:

Execute the following command:

```
# /usr/cluster/bin/scswitch -z -g group-name -h host-name
```

9. On the executing node, start the HiRDB service.

```
# /opt/HiCommand/Base/bin/hcmdsdbsrv -start
```

10. Back up the database (see the *HiCommand Tuning Manager Server Administration Guide*).

11. On the executing node, re-create the database area on the local disk.

```
# /opt/HiCommand/Base/bin/hcmdsdbclustersetup -removecluster -databasepath
database-re-creation-destination-directory -exportpath data-storage-directory
```

Notes:

– Delete or empty *data-storage-directory* before executing the command.

– Specify an absolute path for *database-re-creation-destination-directory* and *data-storage-directory* using no more than 63 bytes. Note that you cannot specify a path delimiter (forward slash(/)) at the end of *database-re-creation-destination-directory* and *data-storage-directory*. If you do so, a command error occurs. If a command error occurs, remove the path delimiter (/), and then re-execute the command.

– Place *database-re-creation-destination-directory* and *data-storage-directory* on a local disk.

– The characters shown below can be used for *database-re-creation-destination-directory* and *data-storage-directory*. In addition, you can use a forward slash (/) as a path delimiter. However, you cannot use space characters in a path.

A-Z, a-z, 0-9, periods (.), and underscores (_)

– When the `hcmdsdbclustersetup` command is executed, the value set for the port number that is used by HiRDB (the embedded database) returns to the default value (23032). If the value was changed to a value other than the default value, reset the port number after executing the command.

12. Install or upgrade Tuning Manager in accordance with the procedure for setting up the cluster environment. Then, set up the cluster environment.

For details on the cluster environment settings for other HiCommand Suite products, see the relevant manual for each product.

3.3.10 Setting up Performance Reporter in a Cluster System

This section describes how to set up Performance Reporter in a cluster system.

3.3.10.1 Setup

To migrate Performance Reporter from a non-cluster configuration to a cluster configuration or from a cluster configuration to a non-cluster configuration, perform unsetup and uninstall Performance Reporter, then re-install Performance Reporter.

In a cluster system, Performance Reporter is collectively installed by the Tuning Manager installer. For information about installation using the Tuning Manager installer, see section 3.1 or 3.2.

After you install Performance Reporter in the cluster system, perform the following procedure on the executing and standby nodes (you can start with either node).

Note: At installation, you cannot specify an area on the shared disk as the installation destination. Install Performance Reporter on the local disks of all the nodes that make up the cluster.

1. Check the environment.
   - Make sure the locale of the executing node and standby node are the same.
   - Check the logical IP address of Tuning Manager.
   - Check the shared disk and shared directory.
2. Enter the logical IP address of the Collection Manager to be connected in the initialization settings file (`config.xml`). Set the IP address after `value` in the `param name="host"` line between `<vserver-connection>` tags.

   Example: When the logical IP address is 999.999.999.999

```
<vserver-connection>
    <param name="host" value="999.999.999.999"/>
    <param name="port" value="22286"/>
</vserver-connection>
```

3. Enter the directory storing the bookmark repository in to the initialization settings file (`config.xml`). The directory must be on the shared disk. Set the directory name after `value` in the `param name="bookmarkRepository"` line between `<bookmark>` tags.

   Example: When the storage directory is on the shared disk of Windows: `u:\cluster_joint\bookmarks"`

```
<bookmark>
    <param name="bookmarkRepository"
           value="u:\cluster_joint\bookmarks"/>
</bookmark>
```

   For information about the bookmark repository, see the *HiCommand Tuning Manager Server Administration Guide*.

4. Restart the Performance Reporter service. The changes in the initialization settings file (`config.xml`) take effect. For information about starting the Performance Reporter service, see the *HiCommand Tuning Manager Server Administration Guide*.
5. Register Performance Reporter in cluster software. See section 3.3.3 or 3.3.4.
6. Add an agent for the new product. See Chapter 5.

Notes:

- Perform this procedure on both the executing node and standby node. You can start performing the procedure in either node.
- When you add an agent for a new product other than Agent for Platform, you need to execute the `jpcpragtsetup` command on all the nodes that make up the cluster.
- The initialization settings file (`config.xml`) is stored in the following directories:
  - In Windows: *installation-folder*`\conf\`
  - In Solaris: `/opt/HiCommand/TuningManager/PerformanceReporter/conf/`

  For information about the initialization settings file (`config.xml`), see the *HiCommand Tuning Manager Server Administration Guide*.

3.3.10.2 Canceling Setup

You must perform unsetup and then uninstall Performance Reporter. For information about performing unsetup and uninstalling Performance Reporter in a cluster system, see section 8.1.3 and 8.2.3.

Note: In a cluster configuration, the repository stored in the shared disk at the creation of the cluster cannot be deleted by uninstalling program products. You need to delete the repository manually.

3.3.11 Operating Performance Reporter in a Cluster System

This section describes how to execute the commands of Performance Reporter running in a cluster system, and the action to take if a failure occurs.

3.3.11.1 Executing Commands

In a cluster system, the following commands can be executed only on the executing node:

- `jpcrdef create`
- `jpcrdef delete`
- `jpcrdef output`
- `jpcasrec update`
- `jpcasrec output`
- `jpcaspsv update`

- jpcaspsv output
- jpcrpt

For the commands that connect Performance Reporter to Collection Manager, set the Collection Manager to be connected using host in the initialization settings file (config.xml). For information about the initialization settings file (config.xml), see the *HiCommand Tuning Manager Server Administration Guide*. Only the logical IP addresses of the logical hosts that are used to create a cluster system can be specified for host. The applicable commands are listed above and they can be executed only on the executing node.

Batch commands operate without connecting Performance Reporter to Collection Manager. The commands applicable to cluster system operation are jpcprras and jpcpragtsetup.

3.3.11.2 Troubleshooting in a Cluster System

This section describes how to handle failures when Performance Reporter is running in a cluster system.

Collecting Error Information and Correcting Errors when a Failover Occurs

If a failure occurs in the executing node in a cluster system, processing is transferred to the standby node. When a failover occurs, the services of the executing server stop.

Trace logs, event logs, and configuration files need to be collected if a failure occurs. These files are generated on the local server. Execute the jpcprras command on the local server to collect the files. To collect the logs before and after the failure, execute the jpcprras command on both the server (node) that stopped execution due to the failover and the server (node) that takes over the processing. We recommend that you collect and check the logs of the cluster software and the operating system as well.

Analyze the acquired information and eliminate the cause of the error that occurred in the executing node. Then restore the executing node.

Restoring Damaged Bookmark Repository Information

Performance Reporter registers, updates, and deletes only the bookmark repository. Since the bookmark repository consists of text files, the files might be damaged if a service ends due to a file access error. Performance Reporter restores the damaged repository information. If the damaged repository information cannot be restored, Performance Reporter deletes that information to guarantee the startup of the service.

If a failure is detected or corrected, or a file is deleted, trace logs are output. If the repository information is not restored, error information is output to an event log and the service does not start. In this case, you can delete all the files in the directory of the bookmark repository or copy and paste the backup files of the repository. When you delete all the files in the directory, bookmark information from after the service startup is initialized. When you restore the bookmark information by using the backup data, you can display the bookmark information at the point when the backup is collected.

To restore information as much as possible, we recommend that you collect the backups of the bookmark repository information. To back up, copy all the files in the directory of the bookmark repository information.

For information about the bookmark repository, see the *HiCommand Tuning Manager Server Administration Guide.*

Chapter 4 Preparing to Install or Upgrade Agents

The installation requirements and notes include items common to all Agents and items specific to each Agent. Before you start installing Agents, make sure to read the following topics:

- Reviewing the Installation Requirements (All Agents) (see section 4.1)
- Reviewing Agent-Specific Installation Requirements (see section 4.2)
- Pre-Installation Requirements for Cluster Systems (see section 4.3)

4.1 Reviewing the Installation Requirements (All Agents)

If you are installing an Agent for the first time, read section 4.1.1. If you are upgrading or overwriting an existing Agent, read section 4.1.2.

4.1.1 Before an Initial Installation

- Stop services

  When performing an initial installation of the Tuning Manager series program, stop all services of the Tuning Manager series program on a local host (on both a physical host and a logical host). For details on how to stop services, see the *HiCommand Tuning Manager Agent Administration Guide*.

- Installation directory

  When you install an Agent on a Windows host for the first time, you can select the installation folder. However, if you install an Agent on a Windows host on which a Tuning Manager series program has already been installed, the Agent will be installed in the installation folder of that Tuning Manager series program.

  When you install an Agent on a UNIX host for the first time, the installation directory is fixed (`/opt/jp1pc`) and cannot be changed. Make sure that the `/opt/jp1pc` directory contains no other files or directories. If the installation directory contains any files or directories that have the same name as those to be created during installation, the installation might fail. Also, make sure that you do not include any symbolic links in the installation path.

- Connection-target Tuning Manager

  If you install an Agent on a host where Tuning Manager has already been installed, Tuning Manager on the same host always becomes the Agent's connection-target Tuning Manager. In this case, you cannot change the connection–target Tuning Manager. If you want to connect an Agent to Tuning Manager on a different host, make sure that Tuning Manager does not exist on the host on which you want to install the Agent.

- Resolving the IP address from its own host name

  You must define a `jpchosts` file, `hosts` file, or domain name system (DNS) environment so that the IP address of each host can be resolved from each machine on which Tuning Manager or an Agent is installed. To determine the host names, execute the `hostname` command for a Windows host, or the `uname -n` command for a UNIX host. Run the Agent only in an environment where an IP address can be resolved from its own host name. If the IP address cannot be resolved, change the environment settings so that the IP address can be resolved from its own host name.

- Resolving a host name with FQDN

  When using an Agent in a DNS environment, an FQDN cannot be used to resolve a host name.

- Limitations on the length of host names for HP-UX®

For HP-UX, the length of a host name supported by the Tuning Manager series programs is limited to the first 8. Set the host name length that can be acquired by the `uname -n` command to no more than 8 bytes.

- Restarting the system on a Windows host

  If you update a file that is being used by another application program or the OS, a message is displayed prompting you to restart the system. In this case, you must restart the system in order to complete installation. When you install HTM Agent for the first time, you may need to restart the system in order to make the performance counter for Windows enabled. For more information, see section 4.2.2.

- Using Remote Desktop Connection for management

  For the 64-bit version of Windows Server™ 2003 (IPF), you can use Remote Desktop Connection for Windows Server 2003 for installation, setup, uninstallation, and maintenance. To perform these tasks, you must use a Session 0 connection, not the normal remote desktop connection. To use Session 0, specify the `/console` option as shown below when you start the Remote Desktop Connection application on the work terminal (client):

  ```
  mstsc.exe /console
  ```

  The `mstsc.exe` file is the executable file of the Remote Desktop Connection application. Session 0 is available to only one user at a time.

  Note: For the Terminal Service Client application for Windows 2000, you cannot use the Session 0 connection. Obtain the Remote Desktop Connection application from the following Microsoft Website:

  http://www.microsoft.com/windowsxp/downloads/tools/rdclientdl.mspx

- Work directory used for installation on a UNIX host

  During installation of an Agent, a temporary work directory whose name begins with `jp1pc_AGT` is created under the `/opt` or `/opt/jp1pc` directory. This work directory is automatically deleted when installation is successful. However, if installation does not terminate normally, the work directory might not be deleted. If an error has occurred during installation, check whether the work directory whose name begins with `jp1pc_AGT` exists. If the directory exists, delete it manually.

- Attributes of the installation directory on a UNIX host

  The attributes of the installation directory may be changed to the predefined directory attributes for the product.

4.1.2 Before an Upgrade or Overwrite Installation

- About an upgrade

  When you upgrade an existing Agent, use an overwrite installation. Do not uninstall the existing Agent. If you uninstall an older version of an Agent, all the data created by it, such as performance data, is also deleted together with deletion of the program, thereby leaving no data for the new version of the Agent.

- Before starting an upgrade or overwrite installation

Before starting an upgrade or overwrite installation, make sure that you back up the existing databases. For details on the databases to be backed up, see the *HiCommand Tuning Manager Agent Administration Guide*. Also make sure that the version of the Agent being installed is newer than the existing Agent's version. If you accidentally overwrite the existing version with an older one, an error might occur, for example, that prevents you from viewing the existing reports. To check the version, see section 5.1.

When an Agent is overwritten, the following resources are updated automatically. If necessary, you may have to perform setups for these resources again.

- Agent Store's Store database files
- `ini` files
- Agent's instance environment

Before you start an upgrade or overwrite installation of the Tuning Manager series program, stop all services of the Tuning Manager series program on a local host (on both a physical host and a logical host). For details on how to stop services, see the *HiCommand Tuning Manager Agent Administration Guide*.

- File size of Store database during an upgrade or overwrite installation

  An upgrade or overwrite installation will fail if any of the files in the existing group of Store database files (`*.DB` and `*.IDX`) is larger than 2 gigabytes. For a successful installation, the Store database must be initialized by following the procedure below. You can then perform the installation:

  a) Stop the Agent service.

  Use the `jpcstop` command to stop the Agent service that has reached the maximum file size for the database. The command format is as follows:

  - **For Windows**

    `cd` *installation-folder*`\tools`

    `jpcstop` *xxxx*

  - **For UNIX**

    `cd /opt/jp1pc/tools`

    `jpcstop` *xxxx*

  # In *xxxx*, specify the Agent-specific service key. For the Agent-specific service key, see Table 4.1.

  b) Check the status of the Agent service.

  Use the `jpcctrl list` command to display the service status and make sure that the Agent service has been stopped.

  ```
  jpcctrl list "*"
  ```

  c) Initialize the Store database.

  Initialize the Store database by deleting the Agent service's Store database files. If the Store database storage directory has been specified (changed) in `jpcsto.ini` file, delete the files under the specified directory. Sample command executions are as follows.

  - **For Windows**

```
cd installation-folder\xxxx\store[\instance-name]Note
del *.DB
del *.IDX
```

– **For UNIX**

```
cd /opt/jp1pc/xxxx/store[/instance-name]Note
rm ./*.DB
rm ./*.IDX
```

Note: For an Agent whose instance environment has been created, the Store database is stored in a directory that has the same name as *instance-name*.

Table 4.1 Service Keys for Agents

Agent	Service Key
Agent for RAID	agtd
Agent for RAID Map	agte
Agent for Platform (Windows)	agtt
Agent for Platform (UNIX)	agtu
Agent for SAN Switch	agtw
Agent for NAS	agtn
Agent for Oracle	agto
Agent for Microsoft SQL Server	agtq
Agent for Microsoft Exchange Server	agtz
Agent for DB2	agtr

- Store database after an upgrade or overwrite installation

  After upgrading or overwriting, the maximum file size becomes 1.8 gigabytes for each file in the Store database file group (*.DB and *.IDX). If limitations have been placed on the file size and file system by the ulimit command, either 90% of the limit value or 1.8 gigabytes, whichever is smaller, becomes the maximum file size.

  If the file size exceeds the applicable maximum after upgrading or overwriting, the system deletes excess data and outputs the KAVE05834-W message to the common message log.

  The following rules are used to select the data to be deleted:

  – PD or PL record type databases

    The data that has the oldest collection time is deleted first.

  – PI record type databases

    The data whose summary period is by minute, hour, day, week, month, and year is deleted, in this order. Within a summary period, the data with the oldest collection time is deleted first.

Thus, the older data might be deleted. If necessary, output the performance data to the CSV file, and then perform the upgrade or overwrite installation. For details about how to output the data to the CSV file, see the chapter that describes file output of reports by Performance Reporter in the *HiCommand Tuning Manager User's Guide*.

- To upgrade an Agent whose data model has been upgraded

  If the data model version is changed, the disk space requirement for the Store database is also changed. Check and, if necessary, revise the data collection items and frequency and data retention conditions for the Store database as appropriate for the new data model.

- Performing an upgrade or overwrite Installation in a Solaris environment

  If you perform an upgrade or overwrite installation of an Agent in a Solaris environment, depending on the OS settings, the following error message might appear:

  An example of a displayed message (for Agent for RAID)

```
Current administration requires that a unique instance of the <HTMRaid> package be created.
However, the maximum number of instances of the package which may be supported at one time
on the same system has already been met.

No changes were made to the system.
```

  Note: The `Raid` portion in `<HTMRaid>` is a character string specific to Agent for RAID. The character string displayed in `<HTMRaid>` varies depending on the Agent to be installed. The following table indicates the character string specific to each Agent.

  Table 4.2 Character String Specific to Each Agent

Agent	Character String Specific to Each Agent
Agent for RAID	`Raid`
HTM Agent	`Agent`
Agent for SAN Switch	`Switch`
Agent for NAS	`NAS`
Agent for Oracle	`Ora`

  In this case, perform the following procedure to change the information defined in the installation management file that the `pkgadd` command references. To make these changes, you must be logged in as a superuser.

  To change the information defined in the installation management file:

  a) Use a text editor to open the default installation management file (`/var/sadm/install/admin/default`).

  b) Check the information defined in `instance=`. If `unique` or `quit` is defined, change the definition to `overwrite`.

  c) Save the changes, and then close the text editor.

  The above changes might affect the installation of other applications. After you finish an upgrade or overwrite installation of the Agent, make sure that you change the definition in `instance=` from `overwrite` back to the original setting of `unique` or `quit`.

- Restarting the system on a Windows host

  If you update a file that is being used by another application program or the OS, a message is displayed prompting you to restart the system. In this case, you must restart the system in order to complete installation.

- Using Remote Desktop Connection for management

  For the 64-bit version of Windows Server 2003 (IPF), you can use Remote Desktop Connection for Windows Server 2003 for installation, setup, uninstallation, and maintenance. To perform these tasks, you must use a Session 0 connection, not the normal remote desktop connection. To use Session 0, specify the `/console` option as shown below when you start the Remote Desktop Connection application on the work terminal (client):

  ```
  mstsc.exe /console
  ```

  The `mstsc.exe` file is the executable file of the Remote Desktop Connection application. Session 0 is available to only one user at a time.

  Note: For the Terminal Service Client application for Windows 2000, you cannot use the Session 0 connection. Obtain the Remote Desktop Connection application from the following Microsoft Website:

  http://www.microsoft.com/windowsxp/downloads/tools/rdclientdl.mspx

- Work directory used for installation on a UNIX host

  During installation of an Agent, a temporary work directory whose name begins with `jp1pc_AGT` is created under the `/opt` or `/opt/jp1pc` directory. This work directory is automatically deleted when installation is successful. However, if installation does not terminate normally, the work directory might not be deleted. If an error has occurred during installation, check whether the work directory whose name begins with `jp1pc_AGT` exists. If the directory exists, delete it manually.

- Attributes of the installation directory on a UNIX host

  The attributes of the installation directory may be changed to the predefined directory attributes for the product.

4.2 Reviewing Agent-Specific Installation Requirements

This section provides Agent-specific installation requirements and notes. Before installing an Agent, make sure you refer to the appropriate section:

- Agent for RAID (see section 4.2.1)
- HTM Agent (see section 4.2.2)
- Agent for SAN Switch (see section 4.2.3)
- Agent for NAS (see section 4.2.4)
- Agent for Oracle (see section 4.2.5)
- Agent for Microsoft SQL Server (see section 4.2.6)
- Agent for DB2 (see section 4.2.7)

4.2.1 Agent for RAID

This manual uses abbreviations and generic names to represent storage subsystems that Agent for RAID supports. For details on the abbreviations used for the storage subsystems, see section 7.1.

When Monitoring TagmaStore® USP or Lightning™ Series

- Connection between the installed host and monitoring targets

  Because Agent for RAID accesses the storage subsystem via a Fibre Channel, Agent for RAID must be installed on a host connected to the storage subsystem via a Fibre Channel.

- Assigning a logical unit to the command device

  One of the logical units in the storage subsystem must be assigned to a command device.

- Items that require the setting of instance information in an upgrade installation

  In an upgrade installation of Agent for RAID, when the following instance items are newly added, the default value (`N`) is set for these items:

  - `Mainframe Volume Monitoring` (supported from Agent for RAID 5.0)
  - `Unassigned Open Volume Monitoring` (supported from Agent for RAID 5.1)

  Update an instance environment as necessary to reconfigure the values for these instance items. For details on how to update an instance environment, see section 7.1.4.

When Monitoring TagmaStore AMS/WMS Series or Thunder Series

- Connection between the installed host and monitoring targets

  Because Agent for RAID accesses the storage subsystem via a LAN, Agent for RAID must be installed on a host connected to the storage subsystem via a LAN.

- Programs that cannot be used with Agent for RAID
  - Storage Navigator Modular.
  - The Disk Array Management Program or Integrated Disk Array Management Program.
  - The Disk Array Utility or Disk Array Utility for Web.
  - Programs that use the API for the Disk Array Management Program.

  If any of the above programs are used with Agent for RAID, the following problems may occur:
  - Agent for RAID may fail to collect data if any of the programs are active.
  - One or more of the programs may not be executed while Agent for RAID is active.
  - When the Password Protection facility is enabled, Agent for RAID on another host cannot collect data as long as you are logged in to the system using any of the above programs.

- Port number used by storage subsystems

  Agent for RAID uses TCP/IP to communicate with TagmaStore AMS/WMS series and Thunder 9500V™ series. If you have changed the port number used for communication by these storage subsystems from 2000 (default value) to some other value, you must set the new port number in the `services` file for the machine where Agent for RAID has been installed. If you start Agent for RAID before changing the settings in the `services` file, data collection will fail. For details about checking the port number used by storage subsystems and about changing the settings in the `services` file, as well as for notes on changing the port number, see the applicable storage subsystem documentation.

- Items that require the setting of instance information in an upgrade installation

  In an upgrade installation of Agent for RAID, when the following instance items are newly added, no value is set for these items:
  - `user ID` (supported from Agent for RAID 5.5)
  - `password` (supported from Agent for RAID 5.5)

  Update an instance environment as necessary to reconfigure the values for these instance items. For details on how to update an instance environment, see section 7.1.4.

4.2.2 HTM Agent

- Agent to be installed

  HTM Agent is an abbreviation of the program named **HiCommand Tuning Manager - Agent**. HTM Agent for Windows includes Agent for RAID Map, Agent for Platform, and Agent for Microsoft Exchange Server. When installing HTM Agent on a Windows host, you can select whether to install all of these three Agents or only Agent for RAID Map and Agent for Platform.

  HTM Agent for UNIX includes Agent for RAID Map and Agent for Platform. When you install HTM Agent on a UNIX host, these two Agents are installed at the same time.

- The characters not to be specified for collecting data

  The following characters cannot be specified in file system mount point names, disk group names, or host names.

  `: ; ,`

- A host where Agent for Microsoft Exchange Server is to be installed (for Windows systems only)

  Agent for Microsoft Exchange Server must be installed on the host where the Microsoft Exchange Server to be monitored is installed.

- Overwrite installation of HTM Agent due to an installation of Agent for Microsoft Exchange Server (for Windows systems only)

  To add Agent for Microsoft Exchange Server to a host on which Agent for RAID Map and Agent for Platform are already installed, you need to re-execute `setup.exe` of HTM Agent to install Agent for Microsoft Exchange Server. This operation overwrites Agent for RAID Map and Agent for Platform. Any patches that might have been applied to these products will be deleted. Execute the `jpctminfo` command to check the history information of patches, and then install the patches again.

- Restarting the system to enable performance counters (for Windows systems only)

  If you want to display the performance data (configuration information) of a server, both the logical disk performance counter and the physical disk performance counter of Windows must be enabled. When you install HTM Agent, these counters are set to be enabled, but you must restart the system to actually enable them, except in the following cases where they will have already been enabled:

  - When an upgrade installation has been performed to the HTM Agent on the server, in an environment in which server performance data is successfully displayed
  - When both **LogicalDisk** and **PhysicalDisk** are displayed as performance objects on a Windows performance monitor

  In addition, a message dialog may prompt you to restart the system to complete installation. In this case, since updating of the installation file is not yet complete, you must restart the system regardless of the performance counter status.

- Changing the number of kernel bits (for AIX® systems only)

When installing Agent for Platform on an AIX host, Agent for Platform selects a module to be installed, based on the loaded kernel information. Therefore, when you want to change the number of kernel bits, uninstall HTM Agent before the change. Then after changing the number of kernel bits, re-install HTM Agent.

- Settings for collecting I/O statistics information (for AIX systems only)

  Agent for Platform collects the I/O statistics information. If Agent for Platform is operated on an AIX host, execute the `smitty chgsys` command to specify `true` to `Continuously maintain DISK I/O history` for constantly maintaining the DISK I/O history.

4.2.3 Agent for SAN Switch

When Monitoring Brocade® Switches

- Connection between the installed host and monitoring targets

  Agent for SAN Switch accesses a Proxy Switch via a LAN. The Proxy Switch is a specific switch among the switches of the monitored fabric that is connected to Agent for SAN Switch. Agent for SAN Switch must be installed on a host connected to the Proxy Switch via a LAN.

- System environments that cannot be monitored

  Agent for SAN Switch cannot monitor an environment in which both a logical switch for SilkWorm® 12000 and a logical switch for SilkWorm 24000 exist in one switch. When multiple switch ports are bundled and managed as one switch, the switch is called a **logical switch**.

- When changing the settings of a monitored switch

  You must stop Agent for SAN Switch services before you upgrade the monitored switch's firmware version or change the configuration of the switches.

- When changing the version of Solaris or AIX

  The API that Agent for SAN Switch uses to monitor Brocade switches differs depending on the OS version. When you upgrade from Solaris 8 to Solaris 9 or 10, or from AIX 5L 5.1 to AIX 5L 5.2 or 5.3, after changing the OS version, you need to perform an overwrite installation of Agent for SAN Switch. When the overwrite installation is performed, the API corresponding to your OS version is automatically selected. Note that you need to re-install the patches, because the patches that have been applied to Agent for SAN Switch are deleted during the overwrite installation.

When Monitoring McDATA® Switches

- Fabric Management Server

  Bridge Agent and EFCM must be running on the same host. The host where Bridge Agent and EFCM are running is called the **Fabric Management Server**.

- Connection between the installed host and monitoring targets

Agent for SAN Switch accesses a Fabric Management Server via a LAN. Agent for SAN Switch must be installed on a host connected to the Fabric Management Server via a LAN.

- Connection between Fabric Management Server and monitoring switches

  The Fabric Management Server and each switch of the fabric must be connected via a LAN.

- When changing the settings of a monitored switch

  You must stop Agent for SAN Switch services before you upgrade the monitored switch's firmware version, change the configuration of the switches, or install or uninstall EFCM or Bridge Agent from the Fabric Management Server on which Agent for SAN Switch has established a session.

- When using the partitioning function

  If you are using the partitioning function provided by Intrepid 10000, you can examine the following to see which partition is monitored by Agent for SAN Switch: the Switch WWN field of the Switch Detail (PD) record, and the switch's WWN displayed by EFCM. Note that, when this function is used, Agent for SAN switch recognizes one partition as one switch. The Agent cannot recognize multiple partitions as one switch. For details about the Switch Detail (PD) record, see the *HiCommand Tuning Manager Hardware Reports Reference*.

Fabric Configuration that Can Be Monitored

Agent for SAN Switch can also monitor fabrics consisting of Brocade and McDATA switches. (In this case, Agent for SAN Switch will monitor only the vendor switch specified in `Switch Vendor` that was specified when the instance environment was set up.) However, Agent for SAN Switch cannot monitor fabrics that include unsupported switches.

4.2.4 Agent for NAS

Because Agent for NAS accesses the NAS system via a LAN, Agent for NAS must be installed on a host connected to the NAS system via a LAN.

4.2.5 Agent for Oracle

- Host where Agent for Oracle is to be installed

  You must install Agent for Oracle on the host that contains the Oracle database that is to be monitored.

- Required libraries (for UNIX systems only)

  For HP-UX (PA-RISC), HP-UX (IPF), Solaris, and AIX, both the Oracle OCI 64-bit mode library and the Oracle OCI 32-bit mode library are required. When you install Oracle OCI, make sure to install the Oracle OCI 32-bit library on the machine where Agent for Oracle runs.

- Procedures required when performing an upgrade installation

Before performing an upgrade installation of Agent for Oracle, you need to delete the objects registered in the Oracle database (tables and packages that you created in the monitored Oracle database). After the upgrade installation is completed, you need to register those objects in the Oracle database.

For details on how to register objects, see section 7.5.1, and how to delete objects, see section 7.5.3.2.

If you delete the objects after the upgrade installation finishes rather than before the upgrade installation starts, the following message appears: `ORA-04043: object LSC_13_PIDB2 does not exist.` This message, however, does not indicate a serious problem. Even if this message appears, proceed to register the objects again.

4.2.6 Agent for Microsoft SQL Server

You must install Agent for Microsoft SQL Server on the host that contains the Microsoft SQL Server that is to be monitored.

4.2.7 Agent for DB2

You must install Agent for DB2 on the host that contains the DB2 that is to be monitored.

4.3 Pre-Installation Requirements for Cluster Systems

The following Agents can be operated in a cluster system:

- Agent for RAID
- Agent for SAN Switch
- Agent for NAS
- Agent for Oracle
- Agent for Microsoft SQL Server
- Agent for DB2

Note: You can install Agent for RAID Map, Agent for Platform, and Agent for Microsoft Exchange Server on a cluster system's executing node and standby node. Note that these Agents cannot run on a logical host. In the event of a failover in the cluster system, failover does not occur on these Agents running on each node. Because these Agents run separately on each physical host, there is no need to register these Agents in the cluster software.

For details about a cluster system and the system configuration when operating Tuning Manager series programs in a cluster system, see the chapter that describes operations in a cluster system in the *HiCommand Tuning Manager Agent Administration Guide*. For details about the setup procedure for operating an Agent in a cluster system, see Chapter 7. For cluster software supported by Tuning Manager and Agents, see Appendix A.4.

4.3.1 Requirements for Using an Agent in a Cluster System

To operate Agents in a cluster system, the following conditions must be met:

- Cluster System
- Shared Disk
- Logical Host Name and Logical IP Address

Before you install Agents in a cluster system, verify the following:

- Cluster System
  - The cluster system must be controlled by cluster software.
  - The cluster software must be set up to control the starting and stopping of an Agent that runs on a logical host. For Agent for Oracle, Agent for Microsoft SQL Server, and Agent for DB2, set them to fail over together with the monitored databases.
- Shared Disk
  - There must be a shared disk that allows failover from the executing node to the standby node.
  - Shared disks must be physically connected to each node via Fibre Channel or SCSI.

Tuning Manager series programs do not support as shared disks the use of network drives or disks replicated via a network.

- If a process that is using the shared disk remains for some reason when a failover occurs, the shared disk must be forcibly unmounted by the cluster software to allow failover.
- When Tuning Manager series programs are running on one logical host, they must use the same directory name for the shared disk. For the size required for a shared disk, see Appendix A.7

  A Store database can be stored in a different directory on the shared disk by changing the storage location.

- Logical Host Name and Logical IP Address
  - For each logical host there must be a corresponding logical host name, for each logical host name there must be a corresponding logical IP address, and a standby node must be able to inherit data from the executing node.
  - The logical host name and the logical IP address must be set in the `hosts` file and the name server.
  - When DNS is used, the host name (rather than an FQDN name) excluding the domain name is used as the logical host name.
  - Each host must have a unique physical host name and logical host name.

  Notes:
  - Do not specify a physical host name (which is displayed by the `hostname` command in Windows or the `uname -n` command in UNIX) as a logical host name. Doing so may hinder normal communication.
  - Up to 32 single-byte alphanumeric characters can be used for a logical host name. The following characters and spaces cannot be used:

    `/ \ : ; * ? ' " < > | & = ,`
  - You cannot specify `localhost`, an IP address, or a host name beginning with a hyphen (-) as a logical host name.

4.3.2 Notes for Failover of a Logical Host with an Agent

In a system in which an Agent runs on a logical host, you must decide whether the entire logical host should fail over if a failure occurs with the Agent.

If the entire logical host fails over due to a failure with an Agent, business applications on the same logical host on which the Agent runs will also fail over. This may hamper business operations.

Therefore we recommend that you set the cluster software in either of the following ways as necessary. By using these settings, even if a problem occurs, the problem will not have an impact on business applications running on the same logical host as an Agent:

- The activities of an Agent are not monitored.
- Detection of a problem with an Agent does not cause a failover.

Chapter 5 Installing or Upgrading Agents

If you are upgrading or overwriting an existing Agent, you need to read section 5.1 to check the current version of an Agent before you start upgrading or overwriting. The procedures used for an initial installation, upgrade, or overwrite of Agents are the same (except for some command lines).

- Checking the Current Version of an Agent (see section 5.1)
- Installing Agents on a Windows Host (see section 5.2)
- Installing Agents on a UNIX Host (see section 5.3)
- Installing Agents in a Cluster System (see section 5.4)

5.1 Checking the Current Version of an Agent

Before you start an upgrade or overwrite installation, always check the version of the existing Agent. If you accidentally overwrite the existing version with an older one, an error might occur, for example, that prevents you from viewing the existing reports.

When the jpctminfo command has been installed:

The `jpctminfo` command displays product information about Tuning Manager series programs that are installed on the host where the command is executed. You can use this command to check the version and patch history. For details about how to use the `jpctminfo` command, see the *HiCommand Tuning Manager Command Line Interface Guide*.

The `jpctminfo` command is stored in the following directories:

- Windows: *installation-folder*`\tools\`
- UNIX: `/opt/jp1pc/tools/`

The following describes how to check the Agent version and the patch history.

- To check the version of an Agent:

  The following example illustrates version information of Agent for RAID displayed by the `jpctminfo agtd` command. Note that the string `agtd` is the service key specific to Agent for RAID. For the Agent-specific service key of each Agent, see Table 5.1.

```
PRODUCT  HiCommand Tuning Manager - Agent for RAID
VERSION  5.0.0-00(05-00-00)
```

- To check the patch history for an Agent:

  The following example illustrates version and installation dates of patches for Agent for RAID displayed by the `jpctminfo agtd -p` command:

```
PRODUCT  HiCommand Tuning Manager - Agent for RAID
VERSION  5.0.0-02(05-00-02)
PATCH    DATE
050001   2005/10/31
050002   2005/11/30
```

  However, if no patches have been installed, a message will indicate that there is no patch installation history, as shown in the following example:

```
PRODUCT  HiCommand Tuning Manager - Agent for RAID
VERSION  5.0.0-00(05-00-00)
KAVF24903-I There is no patch history information.
```

Table 5.1 Service Keys for Agents Used During the Agent Version Check

Agent	Service Key
Agent for RAID	`agtd`
HTM Agent (see *Note*)	`agte`

Agent	Service Key
Agent for SAN Switch	agtw
Agent for NAS	agtn
Agent for Oracle	agto
Agent for Microsoft SQL Server	agtq
Agent for DB2	agtr

Note: The jpctminfo command uses the agte service key as the service key for HTM Agent. You cannot check the version of Agent for RAID Map, Agent for Platform, or Agent for Microsoft Exchange Server individually. Instead, check the version of HTM Agent by using the agte service key.

When the jpctminfo command has not been installed:

When the jpctminfo command has not been installed, use the method described below to check the version of the Agent currently installed.

- **For Windows**

  Check the version in the dialog box that is displayed during an upgrade or overwrite installation. When you perform an installation on a Windows host, the version information is displayed as follows:

Product version	Character string
5.1.0-00	051000
5.1.0-01	051001
5.1.0-02	051002
5.1.0-03	051003

- **For UNIX**

  Check the version by using the swlist command for HP-UX, the pkginfo command for Solaris, the lslpp command for AIX, or the rpm command for Linux®. Each command format is as follows:

  - **HP-UX:**

    swlist -v HTM*zzzz*

  - **Solaris:**

    pkginfo -l HTM*zzzz*

  - **AIX:**

    lslpp -i HTM*zzzz*.rte

  - **Linux:**

    rpm -qi HTM*zzzz*

    Note: *zzzz* indicates a character string specific to each Agent. Specify the following character string according to the Agent to be installed:

Table 5.2 Character String Specific to Each Agent

Agent	Character String Specific to Each Agent
Agent for RAID	`Raid`
HTM Agent	`Agent`
Agent for SAN Switch	`Switch`
Agent for NAS	`NAS`
Agent for Oracle	`Ora`
Agent for DB2	`DB2`

Executing any of the above commands displays a character string which is converted from the product version based on the following rules:

- The first zero is deleted from the two digits that indicate a version or revision.
- Hyphens (`-`) are replaced by periods (`.`).

Following are the relationships between product versions and character strings that are displayed in the command results:

Product version	**Character string**
5.1.0-00	5.1.0.0
5.1.0-01	5.1.0.1
5.1.0-02	5.1.0.2
5.1.0-03	5.1.0.3

5.2 Installing Agents on a Windows Host

To install an Agent on a Windows host:

1. On the host where the Agent is to be installed, log in as a user who belongs to the Administrators group of the local computer.

   Before proceeding to the next step, make sure that you are a member of the Administrators group.

2. Stop all services of the Tuning Manager series program running on the local host.

   If any services of the Tuning Manager series programs are running, they will be automatically terminated during installation.

3. If any other application programs are running, terminate them.

4. Insert the Agent installation CD-ROM, and execute the `setup.exe`.

   Note: When using Windows Server 2003 (IPF), execute Windows Installer Package (the file with the `.msi` extension).

5. Install the program by entering necessary information according to the installer's instructions.

   You must define the following information during installation:

   a) User information

      Enter user information, such as the user name and company name. You can only specify the user information the first time you install the Tuning Manager series programs.

   b) Installation folder

      Specify the folder in which the Agent is to be installed. The following characters can be used in a folder name:

      `A-Z`, `a-z`, `0-9`, periods (`.`), underscores (_), and space characters.

      You can only specify the installation folder the first time you install the Tuning Manager series programs.

      The default installation folder for Windows (other than Windows Server 2003 x64):

      system-drive`\Program Files\HiCommand\TuningManager\jp1pc`

      The default installation folder for Windows Server 2003 x64:

      system-drive`\Program Files (x86)\HiCommand\TuningManager\jp1pc`

      If Tuning Manager or an Agent is already installed on the host on which you want to install an Agent, you can only install the Agent on the folder where the existing Tuning Manager or Agent is installed.

   c) Components to be installed (for HTM Agent only)

      Only when you execute `setup.exe` of HTM Agent, a panel appears for selecting components to be installed (see Figure 5.1). To install Agent for Microsoft Exchange Server, select the **Agent for MSExchange** check box. Agent for RAID Map and Agent for Platform are always installed, so you cannot use the **Agent for RAID Map** check box and the **Agent for Platform** check box.

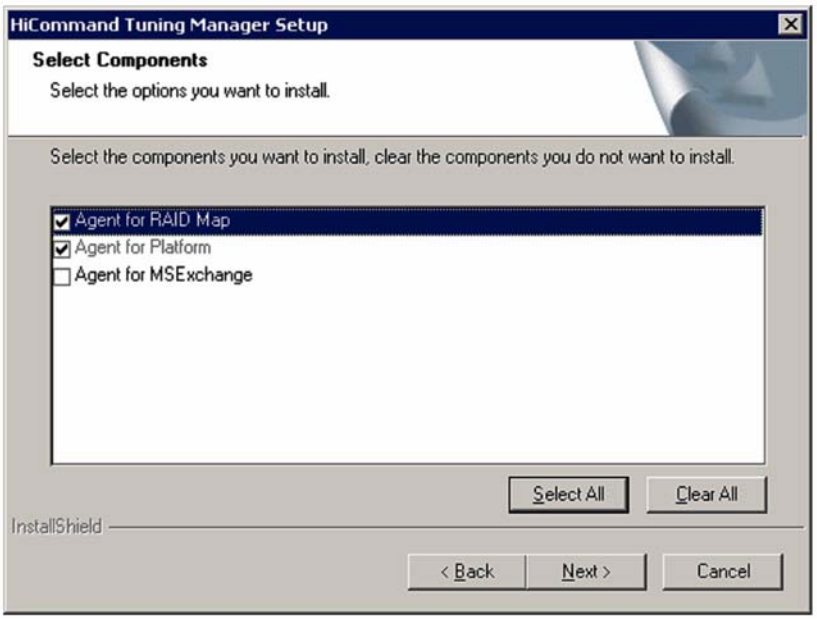


Figure 5.1 Panel for Selecting Components to Be Installed (for HTM Agent Only)

6. Check the common message log after you finish the installation.

   During installation, additional setup may be executed as appropriate to the host environment. The execution results are output to the common message log. Once you have completed the installation, it is important to check the common message log to obtain the results of any additional setup.

Notes:

- You can install an Agent by copying the contents of the installation CD-ROM to the installation target host. In this case, execute `setup.exe` (or, when using Windows Server 2003 (IPF), execute the Windows Installer Package—the file with the .msi extension) in the folder to which the contents were copied.
- When an Agent is installed, the port number used by that Agent is registered at the end of the `services` file. The blank line that may be included during port number registration has no effect on operations.

5.3 Installing Agents on a UNIX Host

To install an Agent on a UNIX host:

1. On the host where the Agent is to be installed, log in as a superuser or use the `su` command to change to the superuser.

   Before proceeding to the next step, make sure that you are a superuser.

2. Stop all services of the Tuning Manager series program running on the local host.

   If any services of the Tuning Manager series programs are running, they will be automatically terminated during installation.

3. If any other application programs are running, terminate them.

4. Insert the Agent installation CD-ROM, and mount the drive to a desired directory.

   The CD-ROM for installing the Agent is in ISO-9660 format with the RockRidge extension. When you install any Agent on a HP-UX system, perform the following procedure to mount the CD-ROM. However, when you install any Agent on an operating system other than HP-UX, use the normal method to mount the CD-ROM.

   Mounting in HP-UX:

   a) Using a text editor, add a line with the following syntax to the `/etc/pfs_fstab` file:

      device-file mount-point filesystem-type translation-method

      where:

      device-file is the CD-ROM device special file name.

      mount-point is the mount point.

      filesystem-type indicates that the CD-ROM being mounted is in ISO-9660 format with the RockRidge extension.

      translation-method indicates that the file name conversion option in the CD-ROM is used to convert file names with upper-case characters to lower-case characters.

      *Example***:**

      ```
      /dev/dsk/c2t2d0 /cdrom pfs-rrip xlat=unix 1 0
      ```

   b) Enter the following command:

      ```
      nohup /usr/sbin/pfs_mountd &
      ```

   c) Enter the following command:

      ```
      nohup /usr/sbin/pfsd &
      ```

   d) Set the CD-ROM for installing the Agent in the CD-ROM drive and mount it onto the desired directory. To mount the CD-ROM onto `/cdrom`, enter the following command:

      ```
      /usr/sbin/pfs_mount /cdrom
      ```

5. Execute the installation command with the required option specified. Each command format is as follows. Note that *zzzz* portions in `HTMzzzz` for the following command lines are character strings specific to each Agent. Specify the character string according to the Agent to be installed. For Agent-specific character strings, see Table 5.2:

   For HP-UX (when the CD-ROM is mounted on the `/cdrom` directory)

   – Initial Installation:

   ```
   swinstall -s /cdrom HTMzzzz
   ```

   – Upgrade or Overwrite Installation:

   ```
   swinstall -x reinstall=true -s /cdrom HTMzzzz
   ```

   For Solaris (when the CD-ROM is mounted on the `/cdrom/cdrom0` directory), for an initial, upgrade, or overwrite installation (see *Note*):

   ```
   pkgadd -d /cdrom/cdrom0 HTMzzzz
   ```

   For AIX (when the CD-ROM is mounted on the `/cdrom` directory)

   – Initial Installation:

   ```
   installp -acgNX -d /cdrom HTMzzzz
   ```

   – Upgrade or Overwrite Installation:

   ```
   installp –acFNX -d /cdrom HTMzzzz
   ```

   For Linux (when the CD-ROM is mounted on the `/cdrom` directory):

   – Initial Installation:

   ```
   rpm -ivh /cdrom/HTMzzzz.rpm
   ```

   – Upgrade or Overwrite Installation:

   ```
   rpm -Uvh --nopreun --nopostun --replacepkgs /cdrom/HTMzzzz.rpm
   ```

   *Note***:** If you are upgrading or overwriting an Agent in a Solaris environment, the procedure might fail depending on the OS settings. In this case, review the instruction *Performing an upgrade or overwrite Installation in a Solaris environment* in section 4.1.2.

6. Check the common message log after you finish the installation.

   During installation, additional setup may be executed as appropriate to the host environment. The execution results are output to the common message log. Once you have completed the installation, it is important to check the common message log to obtain the results of any additional setup.

*Notes***:**

- You can install the Agent by copying the contents of the installation CD-ROM to the installation target host (ensure that the contents (files) are archived using an archive command such as `tar` before copying them to the installation target host). In this case, replace the directory indicated in step 5, where the installation command is mounted, with the directory to which the contents were copied, and then execute the command.
- When an Agent is installed, the port number used by that Agent is registered at the end of the `services` file. The blank line that may be included during port number registration has no effect on operations.

5.4 Installing an Agent in a Cluster System

Install an Agent in the executing and standby nodes. It must be installed on a local disk. Do not install it on a shared disk.

The installation procedure is the same as that for a non-cluster system. For details on the procedure, see section 5.2 for Windows hosts, and see section 5.3 for UNIX hosts. Before you start the installation, please read Chapter 4.

Chapter 6 Setting up Tuning Manager Series Programs

This chapter describes the setup procedures required to run Tuning Manager series programs correctly, and optional setup procedures used to change default settings. For details on the commands used for the setup, see the *HiCommand Tuning Manager Command Line Interface Guide*. Agents (except Agent for Platform and Agent for Microsoft Exchange Server) require setup procedures specific to each Agent. For details on setup procedures specific to each Agent, see Chapter 7.

- Setting the LANG Environment Variable (UNIX) (see section 6.1)
- Specifying the Connection-Target Tuning Manager (see section 6.2)
- Setting up an Instance Environment (see section 6.3)
- Configuring the Port Number (see section 6.4)
- Setting the IP Address (see section 6.5)
- Changing the File Size of the Common Message Log (see section 6.6)
- Changing the Settings of the Agent Store Service (see section 6.7)
- Registering an Agent (see section 6.8)
- Changing the Host Name After Starting Operations (see section 6.9)
- Changing the Connection-Target Tuning Manager (see section 6.10)

6.1 Setting the LANG Environment Variable (UNIX)

Before you start setting up Tuning Manager series programs, you must specify the LANG environment variable on the following hosts:

- Tuning Manager host
- Agent host

Table 6.1 shows the LANG environment variable that can be used in the Tuning Manager series program.

Before setting LANG environment variables, make sure that the language environment that will be set is installed and configured correctly. If the language environment is not correctly installed or configured, characters may be displayed incorrectly, or definition data may be inappropriately overwritten.

Note: The language of the common message log will be determined by the LANG environment variable set during service startup and command execution. Therefore, if multiple language encodings are used, the user may encounter character strings from different languages.

Table 6.1 LANG Environment Variables Supported by Tuning Manager Series Programs

OS	Language		LANG Environment Variables
HP-UX	English		`C`
	Japanese	Shift-JIS encoding	▪ `ja_JP.SJIS` ▪ `japanese`
		EUC encoding	▪ `ja_JP.eucJP` ▪ `japanese.euc`
Solaris	English		`C`
	Japanese	Shift-JIS encoding	`ja_JP.PCK`
		EUC encoding	▪ `ja` ▪ `japanese`
AIX	English		`C`
	Japanese	Shift-JIS encoding	▪ `Ja_JP` ▪ `Ja_JP.IBM-932`
		EUC encoding	▪ `ja_JP` ▪ `ja_JP.IBM-eucJP`

Linux	English		C
	Japanese (see *Note*)	Shift-JIS encoding	Not applicable
		EUC encoding	▪ ja_JP.eucJP ▪ ja_JP.ujis

Note: Japanese is not supported for Linux 4 and Linux AS 4 (IPF).

6.2 Specifying the Connection-Target Tuning Manager

You must perform this setup procedure on an Agent host.

On the host where an Agent is installed, you must specify the Tuning Manager that manages that Agent. Please note the following points about specifying the connection-target Tuning Manager:

- There can be only one connection-target Tuning Manager for each Agent host. If more than one Agent is installed on the same host, you cannot specify different connection-target Tuning Managers for the Agents.
- If an Agent and Tuning Manager are installed on the same host, the Tuning Manager on the same host becomes the connection-target Tuning Manager. In this case, you cannot change the connection-target Tuning Manager to a Tuning Manager on a remote host.
- Before you start the setup procedure, you must stop all services of the Tuning Manager series program that are running on the local host. If a service of the Tuning Manager series program is active during execution of the `jpcnshostname` command, a message is displayed that asks you to stop the service.

To specify the connection-target Tuning Manager:

1. Stop all services of the Tuning Manager series program running on the local host.
2. Execute the `jpcnshostname` command with the host name of the connection-target Tuning Manager specified. For example, if the connection-target Tuning Manager is on host `host01`, specify the following:

   ```
   jpcnshostname -s host01
   ```

6.3 Setting up an Instance Environment

If an Agent requires a configured instance environment to monitor its target, you must set up the instance environment on the Agent host. The following Agents require an instance environment to be configured in order to monitor a target:

- Agent for RAID
- Agent for SAN Switch
- Agent for NAS
- Agent for Oracle
- Agent for Microsoft SQL Server
- Agent for DB2

For details on how to set up an instance environment, see Chapter 7.

Agent for RAID Map, Agent for Platform, and Agent for Microsoft Exchange Server are Agents that do not require a configured instance environment to monitor a target. You do not have to set up an instance environment for these Agents.

6.4 Configuring the Port Number

Set a fixed port number for each service if you want to operate the Tuning Manager series system in an environment that requires fixed port numbers, such as when you want to allow communication through a firewall between Tuning Manager and an Agent. Configure the port numbers on the following hosts:

- Tuning Manager host
- Agent host

Port numbers are allocated for services of the Tuning Manager series program, shown in Table 6.2, by default. For other services and programs, a port number that is not currently being used by the system is allocated automatically every time the service is started.

Table 6.2 Default Port Numbers and Tuning Manager Series Program Services

Service Name	Parameter	Port Number	Description
Name Server	`jp1pcnsvr`	22285	The port number used for the Name Server service of Tuning Manager. Configured at all hosts of the Tuning Manager series programs.
Status Server	`jp1pcstatsvr`	22350	The port number used for the Status Server service of Tuning Manager and an Agent. Configured on the Tuning Manager and Agent host.
View Server (between Performance Reporter and View Server service)	`jp1pcvsvr`	22286	The port number used for communication between the View Server service of Tuning Manager and Performance Reporter. Configured on the Tuning Manager host.

Note: The Status Server service starts when the status management function is enabled. For details on each service, see the *HiCommand Tuning Manager Agent Administration Guide*.

If you set a port number other than the default for the View Server service (between Performance Reporter and View Server service), it is necessary to set the same port number in the initial setting file (`config.xml`) of Performance Reporter. If the same port number is not set, Performance Reporter will fail to communicate with the View Server service. For details on how to set the initial setting file (`config.xml`), see the *HiCommand Tuning Manager Server Administration Guide*. Note that the port number for the View Server service (between Performance Reporter and View Server service) needs to be set only on the Tuning Manager host, and not on the Agent host.

For the list of port numbers, and details on settings and notes for passing through a firewall between Tuning Manager and the Agent, see the appendix in the *HiCommand Tuning Manager Agent Administration Guide*.

- Be aware of the following when allocating a fixed port number to each service:
  - Unify the combination of port numbers and service names throughout the entire Tuning Manager series system to avoid confusion during operation.
  - Set the same value for the `jp1pcnsvr` port number at all hosts of the Tuning Manager series programs.
- Before setting a port number, stop all services of the Tuning Manager series program running on the entire Tuning Manager series system. After setting a port number, start the services manually. It is not necessary to stop the services when displaying the port numbers.

To set the port number:

1. Stop all services of the Tuning Manager series program running on the entire Tuning Manager series system.
2. Execute the `jpcnsconfig port` command. For example, to set fixed port numbers for all services, execute the command as follows:
   ```
   jpcnsconfig port define all
   ```
3. Configure a port number for each service. If the `jpcnsconfig port` command is executed, the system will display either the port number presently configured or the default port number. For example, the system will display the following if the port number `22285` is presently configured for the Name Server service:
   ```
   Component[Name Server]
   ServiceID[PN1001]
   Port[22285]    :
   ```
   Operations will vary depending on what kind of setting is desired for the port number. Table 6.3 shows the setting contents and operations. Unless the port numbers conflict within the system, use the port number displayed by the `jpcnsconfig port` command as is.
4. Execute the `jpcnsconfig port` command again to check whether the port number has been configured correctly. For example, to display the port numbers for all services, execute the command as follows:
   ```
   jpcnsconfig port list all
   ```
   If `<error>` is displayed in either the Services column or the Port column, the configuration is incorrect. Reset the port number. If an error still results, the following causes are possible:
   - The port number is not registered in the `services` file.
   - The same port number is registered more than once in the `services` file.

Note: If the `jpcnsconfig port` command is cancelled with the Ctrl + C key, the port number will not be set correctly. Re-execute the `jpcnsconfig port` command and set the port numbers again.

Table 6.3 Port Number Settings

Setting Content	Operations
When using the number displayed as a service fixed port number as is.	Press the Return key.
When changing the displayed port number.	Enter a port number from 1024 to 65535. The port number currently in use cannot be specified.
When not setting a fixed port number.	Enter 0. Even if 0 is entered for the following services, the default value will be set. ▪ Name Server service ▪ Status Server service ▪ View Server service (between Performance Reporter and View Server service)

6.5 Setting the IP Address

You specify the IP address when the Tuning Manager series programs are operating in a network environment connected to multiple LANs. The IP address is defined by editing the `jpchosts` file on the following hosts:

- Tuning Manager host
- Agent host

***Note*:** If the IP address of a host is specified in the `jpchosts` file, the `hosts` file or DNS definitions will not be referenced for the IP address of that host. Therefore, the IP address to be acquired from the host name must be defined in the `jpchosts` file.

To set the IP address:

1. Stop all services of the Tuning Manager series program running on the local host.
2. Open the `jpchosts` file using a text editor. The storage location for `jpchosts` file is as follows:
   - Windows: *installation-folder*
   - UNIX: `/opt/jp1pc`
3. Edit the `jpchosts` file. For example, if there are two hosts, one with the host name `hostA` and the IP address 20.108.41.1, and another with the host name `hostB` and the IP addresses 20.108.41.2 and 20.108.41.3, specify them as follows:

   ```
   hostA 20.108.41.1
   hostB 20.108.41.2, 20.108.41.3
   ```

   ***Notes*:**
   - When multiple IP addresses are set for a single host, the first IP address specified will have priority.
   - IP address settings are invalid in the following cases:
     - The host name exceeds 32 bytes in length.
     - The host name is `localhost`.
     - An IP address in decimal dot notation (*example:* `172.16.233.12`) is used as the host name.
     - The host name begins with a hyphen (`-`).
     - The host name contains one of the following characters or a space:

       `\ / : , ; * ? " > < | . =`
   - Specify the IP address in decimal dot notation (*example:* `172.16.233.12`).
   - Up to 16 IP addresses can be specified per host.

4. Copy the `jpchosts` file to each host. Because the services of the Tuning Manager series program must use the IP address specified in step 2, copy the `jpchosts` file to each host. The copy destination directory of the `jpchosts` file is as follows:
   - Windows: *installation-folder*
   - UNIX: `/opt/jp1pc`
5. Restart the services of the Tuning Manager series program to apply the information changed in the `jpchosts` file.

6.6 Changing the File Size of the Common Message Log

By default, 2 files of 2,048 kilobyte each are used as log files for the common message log. The file size can be changed by editing the `jpccomm.ini` file on the following hosts:

- Tuning Manager host
- Agent host

The storage location for `jpccomm.ini` file is as follows:

- Windows: *installation-folder*
- UNIX: `/opt/jp1pc`

To change the file size of the common message log:

1. Stop all services of Collection Manager and Agent running on the local host.
2. Open the `jpccomm.ini` file using a text editor.
3. Edit the value for `Common Msglog Size` in `[Common Section]` to change the file size of the common message log.

   Note the following points when editing the `jpccomm.ini` file:

   - Do not enter spaces at the beginning of the line, or before or after an equal sign (=).
   - Specify a value from 4 to 4096 (in kilobytes) for `Common Msglog Size`.
   - In addition to the file size of the common message log, other information is also defined in the `jpccomm.ini` file. Do not change values other than the value for `Common Msglog Size` in `[Common Section]`. If values other than the value for `Common Msglog Size` are changed, the Tuning Manager series programs might not operate properly.
4. Save the `jpccomm.ini` file, and then close it.

Notes:

- The settings of the common message log files are in effect on all Tuning Manager series programs on the same host.
- To return the settings of the `jpccomm.ini` file to the initial settings, use the `jpccomm.ini.model` file in the `jpccomm.ini` file storage directory to overwrite.

6.7 Changing the Settings of the Agent Store Service

If you want to change the settings of the Agent Store service, you need to specify settings on the Agent hosts. Tuning Manager series programs store performance data collected by Agents into the Store database of the Agent Store service. To change the storage location or change the maximum generation number for backup of the Store database of the Agent Store service, directly edit the `jpcsto.ini` file. The storage location for `jpcsto.ini` file is as follows:

- Windows: *installation-folder*`\`*xxxx*`\store`*[\instance-name]*
- UNIX: `/opt/jp1pc/`*xxxx*`/store`*[/instance-name]*

Note that *xxxx* indicates the service key of each Agent. For the service keys of each Agent, see the table in section 4.1.2. Also, note that the *instance-name* directory will not be created for an Agent that does not have an instance environment configured.

Table 6.4 shows items that are edited in the `jpcsto.ini` file: the section name, label names and range of values that can be set.

Table 6.4 Items in jpcsto.ini File to Be Edited

Section Name	Label Name	Value Range (see *Note 1*)	Default Value (Windows)	Default Value (UNIX)	Description
`[Data Section]`	`Store Dir` (see *Note 2*)	Full path name between 1 and 127 bytes	*installation-folder* `\`*xxxx*`\store`*[\instance-name]* (see *Note 3*)	`/opt/jp1pc/`*xxxx*`/store`*[/instance-name]* (see *Note 3*)	Creation destination directory for the Store database of the Agent Store service
	`Backup Dir` (see *Note 2*)	Full path name between 1 and 127 bytes	*installation-folder* `\`*xxxx*`\store`*[\instance-name]*`\backup` (see *Note 3*)	`/opt/jp1pc/`*xxxx*`/store`*[/instance-name]*`/backup` (see *Note 3*)	Backup destination directory for the Store database of the Agent Store service
	`Backup Save`	1 to 9	5	5	Maximum generation number for backup of the Store database of the Agent Store service
	`Dump Dir` (see *Note 2*)	Full path name between 1 and 127 bytes	*installation-folder* `\`*xxxx*`\store`*[\instance-name]*`\dump` (see *Note 3*)	`/opt/jp1pc/`*xxxx*`/store`*[/instance-name]*`/dump` (see *Note 3*)	Export destination directory for the Store database of the Agent Store service

Note 1:

- Specify all directory names with their full paths.
- Aside from the following exceptions, specify all alphanumeric characters, code characters, and spaces:

  ; , * ? ` " < > |
- If the specified value is incorrect, the Agent Store service will not start.

Note 2: You cannot specify a duplicate directory in any directory of `Store Dir`, `Backup Dir`, or `Dump Dir`.

Note 3: For an Agent that does not have an instance environment configured, the *instance-name* directory is not created.

To change the settings of the Agent Store service:

1. Stop services of the Agent for which you want to change the settings.
2. Open the `jpcsto.ini` file using a text editor.
3. Change items in `[Data Section]`, such as the storage directory, for the Store database of the Agent Store service. You can edit the items shown in Table 6.4.

   Note the following points when editing the `jpcsto.ini` file:

   - Do not enter spaces at the beginning of the line, or before or after an equal sign (=).
   - The dot (.) in the value of each label indicates the default storage directory for the Store database of the Agent Store service. The default storage directory for Windows is *installation-folder**xxxx*\`store`*[**instance-name]*, and for UNIX is `/opt/jp1pc/`*xxxx*`/store`*[/instance-name]* (*xxxx* indicates a service key of each Agent. For details on the service keys specific to each Agent, see the table in section 4.1.2). When changing the storage directory, enter the relative path from that storage directory, or an absolute path.
   - Create the directory to be specified before changing the storage directory of the Store database.
   - In addition to the storage directory of the Store database, other information is also defined in the `jpcsto.ini` file. Do not change the values other than those in `[Data Section]`. If values other than those in `[Data Section]` are changed, the Tuning Manager series programs may not operate properly.
4. Save the `jpcsto.ini` file, and then close it.

6.8 Registering an Agent

Typically, this setup procedure is not required because Agent information has already been registered in Tuning Manager. This setup procedure is required when an Agent to be installed is a repaired version that has upgraded its data model version, or when an Agent to be installed is released after Tuning Manager series program has been released. Register an Agent before setting an instance environment. For details on how to set up an instance environment for each Agent, see Chapter 7.

Perform this setup procedure at the following hosts:

- Tuning Manager host
- Agent host

To register Agent information:

1. Copy the Agent setup file on the Agent host to the setup directories for Collection Manager and Performance Reporter on the Tuning Manager host.

   If you transfer Agent setup files with the FTP protocol from another host, transfer them in binary mode. Table 6.5 and Table 6.6 indicate the source and target setup files for Agents.

Table 6.5 Source Agent Setup File and Target Directory (When the Agent Host Is a Windows Host)

Tuning Manager Host	Source File on the Agent Host	Target Directory on the Tuning Manager Host
Windows	*agent-installation-folder*\setup\jpc*xxxx*w.EXE	▪ *collection-manager-installation-folder*\setup\ ▪ *performance-reporter-installation-folder*\setup\
UNIX	*agent-installation-folder*\setup\jpc*xxxx*u.Z	▪ /opt/jp1pc/setup/ ▪ /opt/HiCommand/TuningManager/PerformanceReporter/setup/

Table 6.6 Source Agent Setup File and Target Directory (When the Agent Host Is a UNIX Host)

Tuning Manager Host	Source File on the Agent Host	Target Directory on the Tuning Manager Host
Windows	/opt/jp1pc/setup/jpc*xxxx*w.EXE	▪ *collection-manager-installation-folder*\setup\ ▪ *performance-reporter-installation-folder*\setup\
UNIX	/opt/jp1pc/setup/jpc*xxxx*u.Z	▪ /opt/jp1pc/setup/ ▪ /opt/HiCommand/TuningManager/PerformanceReporter/setup/

Note: The *xxxx* portion of jpc*xxxx*w and jpc*xxxx*u indicates the service key of each Agent. For details about the service keys of each Agent, see the table in section 4.1.2.

2. Move the current directory to the following directory:

When Tuning Manager is on a Windows host:

```
cd performance-reporter-installation-folder\tools
```

When Tuning Manager is on a UNIX host:

```
cd /opt/HiCommand/TuningManager/PerformanceReporter/tools
```

3. Execute the `jpcpragtsetup` command:

   ```
   jpcpragtsetup
   ```

4. Stop all services of the Tuning Manager series program running on the local host.
5. Move the current directory to the following directory:

   When Tuning Manager is on a Windows host:

   ```
   cd collection-manager-installation-folder\setup
   ```

   When Tuning Manager is on a UNIX host:

   ```
   cd /opt/jp1pc/setup
   ```

6. Execute the `jpcagtsetup` command.

   ```
   jpcagtsetup xxxx
   ```

   xxxx indicates the Agent service key. For details about Agent service keys, see the table in section 4.1.2.

7. Start the services of the Tuning Manager series program manually.

6.9 Changing the Host Name after Starting Operations

After configuring the Tuning Manager series system, you can change the host name of the Tuning Manager host or the Agent host. Note that the sizes of the database files (`*.DB` and `*.IDX`) will increase if the host name is changed after operation starts (resulting in improper data storage). When you change the host name after operation starts, you must follow the procedures described in section 6.9.1 or 6.9.2.

6.9.1 Changing the Tuning Manager Host Name

When changing the Tuning Manager host name, perform this setup procedure for the following hosts:

- Tuning Manager host
- Agent host

The following sections describe the operations for each host.

Operations on the Agent Host

1. Stop all services of the Tuning Manager series program in the entire Tuning Manager series system.
2. Use the `jpcnshostname` command to change the settings of the connection-target Tuning Manager host. For example, to change the host name of the connection-target Tuning Manager to `host02`, execute the command as follows:

   ```
   jpcnshostname -s host02
   ```

3. Restart the services of the Tuning Manager series program when the following operations on the Tuning Manager host have finished.

Operations on the Tuning Manager Host

1. Stop all services of the Tuning Manager series program in the entire Tuning Manager series system.
2. If an Agent that has an instance environment configured is installed, delete the instance environment. For details about how to delete instance environments, see Chapter 7.
3. If an Agent that does not have an instance environment configured is installed, delete all the Store database files (*.DB and *.IDX) of the Agent Store service by using the del command (in Windows) or the rm command (in UNIX). For details on the storage directory of the Store database, see section 6.7.

4. Delete all the Store database files (*.DB and *.IDX) of the Master Store service. The default storage location for the Store database files of the Master Store service is as follows:
   - Windows: *installation-folder*\mgr\store
   - UNIX: /opt/jp1pc/mgr/store
5. Delete the jpcns.ini service configuration information file. Also, if the jpcns_backup.ini file exists in the directory where the jpcns.ini file is stored, delete the jpcns_backup.ini file. The storage location for the jpcns.ini file is as follows:
   - Windows: *installation-folder*
   - UNIX: /opt/jp1pc
6. Copy the jpcns.ini.model model file of the service configuration information file using the name jpcns.ini. The storage location for jpcns.ini.model file is as follows:
   - Windows: *installation-folder*
   - UNIX: /opt/jp1pc
7. Change the host name of the Tuning Manager host. Also, if it is necessary to change the settings in the hosts and jpchosts files, change those settings. If it is necessary to restart the host on which the services of the Tuning Manager series program are set to start automatically, change the settings of the services so that the services do not start automatically. After the processing of the proceeding steps has finished on the Tuning Manager host, restore the service settings of the Tuning Manager series program so that services of the Tuning Manager series program start automatically. For details on how to change the settings to start the services, see the HiCommand Tuning Manager Agent Administration Guide.
8. Set the new Tuning Manager host name with the jpcnshostname command. Execute the command as follows:

   ```
   jpcnshostname -u
   ```
9. If an instance environment was deleted in step 2, create the instance environment again. For details about how to create instance environments, see Chapter 7.
10. Restart the services of the Tuning Manager series program on the Tuning Manager host.
11. Delete all service information for the Tuning Manager series program that contains the old Tuning Manager host name.

    Changing the Tuning Manager host name does not change the service information for the Tuning Manager series program that contains the old host name. If you have changed the Tuning Manager host name, you must delete the old service information for the Tuning Manager and Agents. For details on how to delete service information, see the *HiCommand Tuning Manager Agent Administration Guide*.
12. If the Action Handler on a Tuning Manager host is specified for the execution target of the action, change the setting for the alarm. Execute the jpcalarm command on the Tuning Manager host to specify the service ID for the Action Handler that executes the action. For details about how to edit an alarm, and about service IDs, see the HiCommand Tuning Manager Agent Administration Guide.

*Notes***:** After changing the host name, perform the following actions:

- Collection of performance data: Run the Tuning Manager environment for more than double the time specified for the Collection Interval for performance data, and then make sure the data has been collected properly.
- Execution of the `jpcctrl dump` command: Make sure the collected performance data can be output properly.
- Checking the report definition and the alarm definition: Make sure these definitions have been properly created.

6.9.2 Changing the Agent Host Name

When changing the Agent host name, perform this setup procedure for the following hosts:

- Tuning Manager host
- Agent host

The following sections describe the operations for using each host.

Operations on the Agent Host

1. Execute the `jpcstop` command to stop all services of the Tuning Manager series program running on the local host.
2. If an Agent that has an instance environment configured is installed, delete the instance environment. For details about how to delete instance environments, see Chapter 7.
3. If an Agent that does not have an instance environment configured is installed, delete all Store database files (`*.DB` and `*.IDX`) of the Agent Store service by using the `del` command (in Windows) or the `rm` command (in UNIX).

   For details on the installation directory of the Store database, see section 6.7.
4. Delete the `jpcns.ini` service configuration information file. Also, if the `jpcns_backup.ini` file exists in the directory where the `jpcns.ini` file is stored, delete it. The storage location for the `jpcns.ini` file is as follows:
   - Windows: *installation-folder*
   - UNIX: `/opt/jp1pc`
5. Copy the `jpcns.ini.model` model file of the service configuration information file using the name `jpcns.ini`. The storage location for `jpcns.ini.model` file is as follows:
   - Windows: *installation-folder*
   - UNIX: `/opt/jp1pc`

6. Change the host name of the Agent host. Also, if it is necessary to change the settings in the `hosts` and `jpchosts` files, change those settings. If it is necessary to restart the host on which the services of the Tuning Manager series program are set to start automatically, change the settings of the services so that the services do not start automatically. After the processing of the proceeding steps has finished on the Agent host, restore the service settings of the Tuning Manager series programs so that the services of the Tuning Manager series program start automatically. For details on how to change the settings to start the services, see the *HiCommand Tuning Manager Agent Administration Guide*.
7. Use the `jpcnshostname` command to reconfigure the connection-target Tuning Manager. For example, to change the host name of the Tuning Manager for the connection definition to `host01`, execute the command as follows:

   ```
   jpcnshostname -s host01
   ```
8. If an instance environment was deleted in step 2, create the instance environment again. For details about how to create instance environments, see Chapter 7.
9. Restart the services of the Tuning Manager series program.

Operations on the Tuning Manager Host

1. Confirm that the service of the Agent is running. For details on how to display service information of the Tuning Manager series program, see the *HiCommand Tuning Manager Agent Administration Guide*.
2. Delete all service information for the Tuning Manager series program that contains the old Agent host name.

   Changing the Agent host name does not change the service information for the Tuning Manager series program that contains the old host name. If you have changed the Agent host name, you must delete the old service information for that Agent. For details on how to delete service information, see the *HiCommand Tuning Manager Agent Administration Guide*.
3. If the Action Handler on a Tuning Manager host is specified for the execution target of the action, change the setting for the alarm. Execute the `jpcalarm` command on the Tuning Manager host to specify the service ID for the Action Handler that executes the action. For details about how to edit an alarm, see the *HiCommand Tuning Manager Agent Administration Guide*.

Notes: After changing the host name, perform the following actions:

- Collection of performance data: Run the Tuning Manager environment for more than double the time specified for the Collection Interval for performance data, and then make sure the data has been collected properly.
- Execution of the `jpcctrl dump` command: Make sure the collected performance data can be output properly.
- Checking the report definition and the alarm definition: Make sure these definitions have been properly created.

6.10 Changing the Connection-Target Tuning Manager

After configuring the Tuning Manager series system, you can change the connection-target Tuning Manager by executing the `jpcnshostname` command on the Agent host.

Notes:

- Only one Tuning Manager can be set as a connection target per host. If multiple Agents are installed on the same host, different Tuning Managers cannot be set as the connection target for each Agent.
- When the Agent and Tuning Manager are installed on the same host, the connection-target Tuning Manager will be the Tuning Manager on the same host. In such cases, the connection-target Tuning Manager cannot be changed to a Tuning Manager in a remote host.

To change the connection-target Tuning Manager on the Agent host:

1. Execute the `jpcstop all` command to stop all services of the Tuning Manager series program running on the local host.
2. Use the `jpcnshostname` command to change the connection-target Tuning Manager. For example, to change the connection-target Tuning Manager to the Tuning Manager on host02, specify `host02` and execute the following command:

   ```
   jpcnshostname -s host02
   ```

3. Confirm that the new connection-target Tuning Manager is running.
4. Restart the services of the Tuning Manager series program on the Agent host.

At the connection-target Tuning Manager that was connected before the change, delete all service information for the Tuning Manager series program whose service name contains the Agent's host name. For details on how to delete service information, see the *HiCommand Tuning Manager Agent Administration Guide*.

Chapter 7 Setting up the Agents

This chapter describes post-installation setups specific to the following Agents. Note that there are no setup items particular to Agent for Platform and Agent for Microsoft Exchange Server. For setups common to Tuning Manager series programs, see Chapter 6.

- Setting up Agent for RAID (see section 7.1)
- Setting up Agent for RAID Map (see section 7.2)
- Setting up Agent for SAN Switch (see section 7.3)
- Setting up Agent for NAS (see section 7.4)
- Setting up Agent for Oracle (see section 7.5)
- Setting up Agent for Microsoft SQL Server (see section 7.6)
- Setting up Agent for DB2 (see section 7.7)

7.1 Setting up Agent for RAID

This section explains the setup that is required before you can use Agent for RAID. This manual uses abbreviations and generic names to represent storage subsystems that Agent for RAID supports. The following table lists abbreviations and generic names for the storage subsystems.

Table 7.1 Abbreviations Used for Storage Subsystems

Full Name	Abbreviation		
Thunder 9200	Thunder 9200	Thunder series	
Thunder 9520V	Thunder 9500V series		
Thunder 9530V			
Thunder 9570V			
Thunder 9580V			
Thunder 9585V			
Lightning 9910	Lightning 9900 series	Lightning series	
Lightning 9960			
Lightning 9970V	Lightning 9900V series		
Lightning 9980V			
Hitachi TagmaStore Adaptable Modular Storage 200	TagmaStore AMS200	TagmaStore AMS series	TagmaStore AMS/WMS series
Hitachi TagmaStore Adaptable Modular Storage 500	TagmaStore AMS500		
Hitachi TagmaStore Adaptable Modular Storage 1000	TagmaStore AMS1000		
Hitachi TagmaStore Workgroup Modular Storage 100	TagmaStore WMS100	TagmaStore WMS series	
Hitachi TagmaStore Universal Storage Platform 100	TagmaStore USP100	TagmaStore USP	
Hitachi TagmaStore Universal Storage Platform 600	TagmaStore USP600		
Hitachi TagmaStore Universal Storage Platform 1100	TagmaStore USP1100		
Hitachi TagmaStore Network Storage Controller NSC55	TagmaStore NSC55		

7.1.1 Setting up the Storage Subsystems to Be Monitored

This section describes the setup procedures for the following products:

- TagmaStore USP
- Lightning series
- TagmaStore AMS/WMS series
- Thunder series

The following programs are used for TagmaStore USP and Lightning series products:

- Storage Navigator (for TagmaStore USP and Lightning 9900V series products)
- Remote Console (for Lightning 9900 series products)

The following programs are used for TagmaStore AMS/WMS series and Thunder series products:

- Storage Navigator Modular (for TagmaStore AMS/WMS series products)
- Disk Array Management Program (for Thunder series products)

For details about setting up a storage subsystem, see the manual of the storage subsystem you are using.

Make sure that the version of the microcode on the monitored storage subsystem is either the version required by Agent for RAID, or a later version. If the version of the microcode on the storage subsystem is earlier than the microcode version required by Agent for RAID, the system might fail to obtain performance data. For details about the required microcode version, see Appendix A.2.1.

7.1.1.1 Setting up TagmaStore USP or Lightning Series Products

The following describes the setup procedures for TagmaStore USP and Lightning series products.

Setting up a command device

When the storage subsystem is a TagmaStore USP or Lightning series product, Agent for RAID acquires storage subsystem performance and configuration information via a logical device called a **command device**. Command devices of the monitored storage subsystem must be accessible from the host where Agent for RAID is installed.

The following describes the procedures for making a command device accessible from the host where Agent for RAID is installed.

To access a command device:

1. Select the logical device to be specified as a command device.

   Connect to the storage subsystem to be monitored from Storage Navigator and select a logical device as a dedicated command device for Agent for RAID from among the unused logical devices.

2. Set the LU path for the logical device to be specified as a command device.

   For the logical device selected in step 1, set the LU path to the host where Agent for RAID is installed.

   Access to the command device for Agent for RAID may temporarily occupy the resources on the LU path, such as the channel processor. Therefore, when setting the LU path, set it to a port other than that used by the applications that cause steady I/O traffic.

3. Specify the logical device as a command device.

   Set the attributes of a command device to the logical device selected in step 1.

4. Make sure that the command device can be accessed from the host where Agent for RAID is installed.

   Execute the `jpctdlistraid` command on the host where Agent for RAID is installed to ensure that the specified command device information is output.

5. For Windows systems, create partitions in the command device.

   Create a partition in the command device by choosing Windows' **My Computer**, **Manage**, **Storage**, and then **Disk Management**. Make sure that you do not assign a drive letter to the created partition, or mount the partition on a folder, or format the partition. You must use the basic disk assigned to the command device as is.

   After this partition is created, execute the `jpctdlistraid` command again to confirm that GUID has been appended to the information output when the command was previously executed. GUID is an identifier assigned permanently to the partition. Therefore, if you specify GUID instead of the device file name as instance information for Agent for RAID, you need not review or reset Agent instance information even if you change the disk configuration.

   However, if you delete the partition itself, GUID is also discarded. Note that even if you subsequently create a partition of the same size on the same disk, the GUID assigned to this new partition will differ from that assigned to the partition that was deleted.

Notes when using the Storage Logical Partition (SLPR) functionality

The following points describe how the storage subsystem is divided into multiple SLPRs by using the SLPR functionality that is supported by TagmaStore USP:

- The range of information collected by the Agent differs depending on the SLPR to which the logical device specified as a command device belongs:
  - If you specified a command device that belongs to the SLPR whose number is `0`: The Agent collects information about all SLPRs within the storage subsystem. It also collects information about resources shared by multiple SLPRs (i.e. resources that are not partitioned using the SLPR functionality).

- If you specified a command device that belongs to an SLPR whose number is not 0: The Agent collects only information about the SLPR to which the command device belongs. It does not collect information about resources shared by multiple SLPRs (i.e. resources that are not partitioned using the SLPR functionality). This is called the **SLPR restricted mode**.

- When setting the LU path to the host where Agent for RAID is installed, make sure that the port you choose belongs to the same SLPR as the one used by the command device. If you set an LU path that uses a port belonging to an SLPR that is different from that of the command device, statistical performance information might not be acquired due to security restrictions.

For details about the SLPR functionality, see the documentation for Hitachi Virtual Partition Manager.

Settings for collecting performance data

When the storage subsystem to be monitored is a TagmaStore USP or Lightning series product, some record fields provided by Agent for RAID cannot be acquired if settings for collecting performance data are not set in the storage subsystem.

Table 7.2 lists the settings for collecting performance data, and the fields that correspond to these settings. Check the table before you set the required settings.

Table 7.2 Performance Data Collection Settings (for TagmaStore USP and Lightning Series)

Storage Subsystem	Program to Set Up	Setup Location and Settings	Corresponding Fields	
			Record ID	View Name (Manager Name) of Fields
Lightning 9900 Series	HIHSM	In Data Gathering, set Monitoring to ON	PI_RGS	Busy % (BUSY_RATE)
				Max Busy % (MAX_BUSY_RATE)
Lightning 9900V Series	Performance Monitor	In Monitoring Options, set Long Range Monitoring S/W to ON	PI_RGS	Busy % (BUSY_RATE)
				Max Busy % (MAX_BUSY_RATE)
TagmaStore USP See *Note*	Performance Monitor	In Monitoring Options, set Monitoring S/W to ON	PI_RGS	Busy % (BUSY_RATE)
				Max Busy % (MAX_BUSY_RATE)

Note: This setting is not required when TagmaStore USP's microcode version is 50-03-50 or later.

7.1.1.2 Setting up TagmaStore AMS/WMS Series and Thunder Series Products

The following describes the setup procedures for TagmaStore AMS/WMS series and Thunder series products.

Checking the IP address

When the storage subsystem to be monitored is a TagmaStore AMS/WMS series or Thunder series product, Agent for RAID acquires storage subsystem performance and configuration information via a LAN connection between the host and the storage subsystem. You must acquire the IP address assigned to the storage subsystem before setting up Agent for RAID. The DHCP function cannot be used for assigning an IP address to the storage subsystem. Be sure to verify that a fixed IP address has been assigned. You can see the IP address assigned to the storage subsystem via Storage Navigator Modular or Disk Array Management Program.

Creating an account for Agent for RAID (for the TagmaStore AMS/WMS series)

If the storage subsystem to be monitored is the TagmaStore AMS/WMS series and Account Authentication is enabled, a special account for Agent for RAID needs to be created in Storage Navigator Modular. Agent for RAID uses the user ID and password for this account to log in to the TagmaStore AMS/WMS series.

Create an account for Agent for RAID as follows:

- Account Enable/Disable: `Enable`
- Role: `Storage Administrator (View Only)`

Notes:

- Always keep this account enabled while Agent for RAID is running. If the Agent for RAID account is disabled, such as due to a forced logout, Agent for RAID cannot collect performance information.
- Do not set a role other than `Storage Administrator (View Only)` for the Agent for RAID account. If such a role is set, Agent for RAID cannot collect performance information.

When setting up the Agent for RAID instance environment, enter the user ID and password of the account created using Storage Navigator Modular. For details on how to set up an instance environment, see section 7.1.2.

Settings for collecting performance data (for TagmaStore AMS/WMS series and Thunder 9500V series products)

When the storage subsystem is a TagmaStore AMS/WMS series or Thunder 9500V series product, some record fields provided by Agent for RAID cannot be acquired if settings for collecting performance data are not set on the storage subsystem.

Table 7.3 lists the settings for collecting performance data, and the fields that correspond to these settings. Check the table before you set the required settings.

Note: When the storage subsystem of a TagmaStore AMS/WMS series or Thunder 9500V series product is monitored using a real-time report, do not change the **Performance Statistics** settings in the Disk Array Management Program or Storage Navigator Modular.

Table 7.3 Performance Data Collection Settings (for TagmaStore AMS/WMS Series and Thunder 9500V Series)

Storage Subsystem	Program to Set Up	Setup Location and Settings	Corresponding Fields	
			Record ID	View Name (Manager Name) of Fields
Thunder 9500V Series	Disk Array Management Program or Storage Navigator Modular	In **Port Information** in **Performance Statistics**, select the checkbox	PI_PTS	Avg IO /sec (AVG_IO_RATE)
				Avg Xfer /sec (AVG_XFER_RATE)
				Max I/O /sec (MAX_IO_RATE)
				Max Xfer /sec (MAX_XFER_RATE)
				Min I/O /sec (MIN_IO_RATE)
				Min Xfer /sec (MIN_XFER_RATE)
		In **RAID Group / Logical Unit Information** in **Performance Statistics**, select the checkbox	PI_LDA	Read Mbytes (READ_MBYTES)
				Read Xfer /sec (READ_XFER_RATE)
				Write Mbytes (WRITE_MBYTES)
				Write Xfer /sec (WRITE_XFER_RATE)
			PI_LDS	Read Mbytes (READ_MBYTES)
				Read Xfer /sec (READ_XFER_RATE)
				Write Mbytes (WRITE_MBYTES)
				Write Xfer /sec (WRITE_XFER_RATE)
			PI_RGS	Read Mbytes (READ_MBYTES)
				Read Xfer /sec (READ_XFER_RATE)
				Write Mbytes (WRITE_MBYTES)
				Write Xfer /sec (WRITE_XFER_RATE)
		In **Cache Information** in **Performance Statistics**, select the checkbox	PD	Cache Memory Capacity (CACHE_MEMORY_CAPACITY)
			PI	Cache Memory Capacity (CACHE_MEMORY_CAPACITY)
				Cache Memory Usage (CACHE_MEMORY_USAGE)
Thunder 9500V Series	Disk Array Management Program or Storage Navigator Modular	In **Cache Information** in **Performance Statistics**, select the checkbox	PI	Cache Write Pending Usage (CACHE_WRITE_PENDING)
				Cache Write Pending Usage % (CACHE_WRITE_PENDING_RATE)

Storage Subsystem	Program to Set Up	Setup Location and Settings	Corresponding Fields	
			Record ID	View Name (Manager Name) of Fields
				Max Cache Write Pending Usage % (MAX_CACHE_WRITE_PENDING_RATE)
		In **Processor Information** in **Performance Statistics**, select the checkbox	PI_PRCS	Processor Busy % (PROCESSOR_BUSY_RATE)
				Max Processor Busy % (MAX_PROCESSOR_BUSY_RATE)
TagmaStore AMS/WMS series	Storage Navigator Modular	In **Port Information** in **Performance Statistics**, select the checkbox	PI_PTS	Avg IO /sec (AVG_IO_RATE)
				Avg Xfer /sec (AVG_XFER_RATE)
				Max I/O /sec (MAX_IO_RATE)
				Max Xfer /sec (MAX_XFER_RATE)
				Min I/O /sec (MIN_IO_RATE)
				Min Xfer /sec (MIN_XFER_RATE)
		In **RAID Group / Logical Unit Information** in **Performance Statistics**, select the checkbox	PI_LDA	Read I/O Count (READ_IO_COUNT)
				Read I/O /sec (READ_IO_RATE)
				Read Hit I/O Count (READ_HIT_IO_COUNT)
				Read Hit % (READ_HIT_RATE)
				Read Mbytes (READ_MBYTES)
				Read Xfer /sec (READ_XFER_RATE)
				Write I/O Count (WRITE_IO_COUNT)
				Write I/O /sec (WRITE_IO_RATE)
				Write Hit I/O Count (WRITE_HIT_IO_COUNT)
				Write Hit % (WRITE_HIT_RATE)
				Write Mbytes (WRITE_MBYTES)
				Write Xfer /sec (WRITE_XFER_RATE)
TagmaStore AMS/WMS series	Storage Navigator Modular	In **RAID Group / Logical Unit Information** in **Performance Statistics**, select the checkbox	PI_LDS	Read I/O Count (READ_IO_COUNT)
				Read I/O /sec (READ_IO_RATE)

Storage Subsystem	Program to Set Up	Setup Location and Settings	Corresponding Fields	
			Record ID	View Name (Manager Name) of Fields
				Read Hit I/O Count (READ_HIT_IO_COUNT)
				Read Hit % (READ_HIT_RATE)
				Read Mbytes (READ_MBYTES)
				Read Xfer /sec (READ_XFER_RATE)
				Write I/O Count (WRITE_IO_COUNT)
				Write I/O /sec (WRITE_IO_RATE)
				Write Hit I/O Count (WRITE_HIT_IO_COUNT)
				Write Hit % (WRITE_HIT_RATE)
				Write Mbytes (WRITE_MBYTES)
				Write Xfer /sec (WRITE_XFER_RATE)
			PI_RGS	Read I/O Count (READ_IO_COUNT)
				Read I/O /sec (READ_IO_RATE)
				Read Hit I/O Count (READ_HIT_IO_COUNT)
				Read Hit % (READ_HIT_RATE)
				Read Mbytes (READ_MBYTES)
				Read Xfer /sec (READ_XFER_RATE)
				Write I/O Count (WRITE_IO_COUNT)
				Write I/O /sec (WRITE_IO_RATE)
				Write Hit I/O Count (WRITE_HIT_IO_COUNT)
				Write Hit % (WRITE_HIT_RATE)
				Write Mbytes (WRITE_MBYTES)
				Write Xfer /sec (WRITE_ XFER_RATE)
		In Cache Information in Performance Statistics, select the checkbox	PD	Cache Memory Capacity (CACHE_MEMORY_CAPACITY)
			PD_CLPC	Cache Memory Capacity (CACHE_MEMORY_CAPACITY)
TagmaStore AMS/WMS series	Storage Navigator Modular	In Cache Information in Performance Statistics, select the checkbox	PI	Cache Memory Capacity (CACHE_MEMORY_CAPACITY)
				Cache Memory Usage (CACHE_MEMORY_USAGE)

Storage Subsystem	Program to Set Up	Setup Location and Settings	Corresponding Fields	
			Record ID	View Name (Manager Name) of Fields
				Cache Write Pending Usage (CACHE_WRITE_PENDING)
				Cache Write Pending Usage % (CACHE_WRITE_PENDING_RATE)
				Max Cache Write Pending Usage % (MAX_CACHE_WRITE_PENDING_RATE)
			PI_CLPS	Cache Memory Capacity (CACHE_MEMORY_CAPACITY)
				Cache Write Pending Usage (CACHE_WRITE_PENDING)
				Cache Write Pending Usage % (CACHE_WRITE_PENDING_RATE)
				Max Cache Write Pending Usage % (MAX_CACHE_WRITE_PENDING_RATE)
		In **Processor Information** in **Performance Statistics**, select the checkbox	PI_PRCS	Processor Busy % (PROCESSOR_BUSY_RATE)
				Max Processor Busy % (MAX_PROCESSOR_BUSY_RATE)

Confirming the assigned Equipment ID (for Thunder 9500V series)

When the storage subsystem is a Thunder 9500V series product, make sure that a unique Equipment ID is assigned. If there is a storage subsystem assigned with a duplicate Equipment ID, problems such as Main Console items being displayed incorrectly might occur. The Equipment IDs set in the storage subsystem can be viewed and set using the disk array management program.

Enabling array system parameters (for Thunder 9200 products)

When the storage subsystem is a Thunder 9200 product, enable the following array system parameters by using the Disk Array Management Program:

- Inquiry:83H page reporting mode.
- Standard INQUIRY data extended mode.
- Extended INQUIRY WWN mode.

7.1.2 Setting up an Instance Environment

You must specify instance information for the storage subsystem that Agent for RAID will monitor.

Table 7.4 lists the instance information to be specified when the storage subsystem is a TagmaStore AMS/WMS series or Thunder series product. Table 7.5 lists the instance information to be specified when the storage subsystem is a TagmaStore USP or Lightning series product. Check this information before you start the setup procedure.

Table 7.4 Instance Information for Agent for RAID (for TagmaStore AMS/WMS Series and Thunder Series)

Item	Description
Storage Model	Specify 1 as the storage subsystem to be monitored. This item is mandatory.
IP Address or Host Name (Controller 0)	Specify the IP address or host name assigned to Controller 0 of the storage subsystem to be monitored. When this item is specified, Array Unit Name is ignored.
IP Address or Host Name (Controller 1)	Specify the IP address or host name assigned to Controller 1 of the storage subsystem to be monitored. This item is mandatory when IP Address or Host Name (Controller 0) is specified and the storage subsystem to be monitored has a dual controller configuration.
Array Unit Name	Use this item to maintain compatibility with earlier versions. When you create a new instance, we recommend that you specify the storage subsystem to be monitored by setting values in IP Address or Host Name (Controller 0) and IP Address or Host Name (Controller 1). When you use this item to specify the storage subsystem to be monitored, copy the utlprm.inf file generated upon registration of the storage subsystem in the Disk Array Management Program to the following directory: ▪ For Windows: *installation-folder*\agtd\agent*instance-name* ▪ For UNIX: /opt/jp1pc/agtd/agent/*instance-name* *Note:* The contents of the utlprm.inf file are in text format. To send an utlprm.inf file created by the Windows Disk Array Management Program to a UNIX host by FTP, make sure that you use the ASCII mode.
user ID	When the storage subsystem to be monitored is the TagmaStore AMS/WMS series and Account Authentication is enabled, specify the user ID of the Agent for RAID account. For details on how to create this account, see section 7.1.1.2. Do not specify anything if the storage subsystem to be monitored does not support Account Authentication, or Account Authentication is not enabled.
password	Specify the password for the user ID set for user ID. The characters entered for this item are not displayed. You will be required to enter the same value twice. Do not specify anything if the storage subsystem to be monitored does not support Account Authentication, or Account Authentication is not enabled.

Table 7.5 Instance Information for Agent for RAID (for TagmaStore USP and Lightning Series)

Item	Description
Storage Model	Specify 2 as the storage subsystem to be monitored. This item is mandatory.
Command Device File Name	For Windows hosts, specify the device file name or the partition GUID of the command device to be output by the jpctdlistraid command. For UNIX hosts, specify the device file name. Agent for RAID uses this command device to acquire information about the storage subsystem.
Mainframe Volume Monitoring	Select whether Agent for RAID monitors a logical device for which the emulation type used for a mainframe is set. ▪ To monitor a logical device for a mainframe, enter Y or y. ▪ To not monitor a logical device for a mainframe, enter N or n. If no value is entered, the default value N is set and the logical unit for a mainframe is not monitored. If you enter a value other than Y, y, N, or n, the system prompts you to enter a value again.
Unassigned Open Volume Monitoring	Specify whether a logical device for which an open system emulation type has been set and that has not been mapped to a port is to be monitored. ▪ To monitor a logical device that has not been mapped to a port, enter Y or y. ▪ To not monitor a logical device that has not been mapped to a port, enter N or n. If no value is entered, the default value N is set. If you enter a value other than Y, y, N, or n, the system prompts you to enter a value again.

Notes: To enable the Mainframe Volume Monitoring and Unassigned Open Volume Monitoring settings, the microcode version of the Lightning series needs to satisfy the following conditions.

- For the Lightning 9900 series: 01-19-45 or later
- For the Lightning 9900V series: 21-03 or later

The following table shows the types of logical devices in a TagmaStore USP and Lightning series product, and the correspondence with the settings of the instance information for monitoring these logical devices.

Note that in a TagmaStore AMS/WMS series and Thunder series product, all the logical devices are to be monitored regardless of the settings for the instance information.

Table 7.6 Logical Devices in TagmaStore USP and Lightning Series and Correspondence with the Settings for the Instance Information

Type of Logical Device		Settings for Monitoring a Logical Device
A logical device for which an open system emulation type has been set	A logical device that has been mapped to a port	The logical device is always monitored regardless of the settings for the instance information.
	A logical device that has not been mapped to a port	By default, the logical device is not monitored. To monitor the logical device, you need to specify `Y` or `y` for `Unassigned Open Volume Monitoring` when you set the instance information.
A logical device for which a mainframe system emulation type has been set		By default, the logical device is not monitored. To monitor the logical device, you need to specify `Y` or `y` for `Mainframe Volume Monitoring` when you set the instance information.

Use the `jpcinssetup` command to construct an instance environment.

To construct an instance environment:

1. Execute the `jpcinssetup` command with the service key and instance name (no more than 32 bytes) specified.

   For example, to construct an instance environment for the instance named 35053 for Agent for RAID, execute the following command:

   ```
   jpcinssetup agtd -inst 35053
   ```

   Note: Use an instance name that is unique among all the names of the Agent instances on the network. You cannot use `lib` as the instance name.

2. Set up the instance information for the storage subsystem you will monitor.

   Enter the information shown in Table 7.4 or Table 7.5, in accordance with the command's instructions. When entering the displayed default value, or not specifying a value, press only the **Enter** key.

3. To `perform` the operation with multiple instances, repeat steps 1 and 2 for each instance.

4. For UNIX systems, make sure that RAID Manager LIB is installed.

   When the storage subsystem to be monitored is a TagmaStore USP or Lightning series, make sure that RAID Manager LIB is installed on the host where Agent for RAID is installed.

7.1.2.1 About the Constructed Instance Environment

Once you have entered all items, the instance environment is constructed. Described below are the organization of directories for instance environments and the service ID for an instance environment.

Organization of Directories for Instance Environments

Instance environments are constructed under the following directory:

- Windows: *installation-folder*\agtd
- UNIX: /opt/jp1pc/agtd

Table 7.7 shows the organization of the directories for instance environments.

Table 7.7 Organization of Directories for Instance Environments for Agent for RAID

Directory and File Names			Description
agent	*instance-name*	jpcagt.ini	Startup-information file of the Agent Collector service
		jpcagt.ini.model See *Note*	Model file for the startup-information file of the Agent Collector service
		log	Directory for storing internal log files of the Agent Collector service
store	*instance-name*	*.DAT	Data model definition file
		backup	Default directory for backing up the database
		dump	Default directory for exporting the database
		jpcsto.ini	Startup-information file of the Agent Store service
		jpcsto.ini.model See *Note*	Model file for the startup-information file of the Agent Store service
		log	Directory for storing internal log files of the Agent Store service

Note: Use this file to restore the settings that were in effect before the instance environment was constructed.

Service ID for an Instance Environment

The following is the service ID for an instance environment:

product-ID function-ID instance-number instance-name [*host-name*]

The *instance-name* is specified with the `jpcinssetup` command. For details about service IDs, see the *HiCommand Tuning Manager Agent Administration Guide*.

Windows Service Name for an Instance Environment

The following are Windows service names for an instance environment:

- Agent Collector: `PFM - Agent for RAID` *instance-name*
- Agent Store: `PFM - Agent Store for RAID` *instance-name*

The *instance-name* is specified with the `jpcinssetup` command. For details about the Windows service name, see the *HiCommand Tuning Manager Agent Administration Guide*.

7.1.2.2 Verifying Setup of an Instance Environment

Before you start operation in an instance environment you have created, execute the `jpctdchkinst` command to verify the instance settings. The `jpctdchkinst` command references the set instance information and checks whether the settings allow information to be acquired from the storage subsystem monitored by Agent for RAID. For details about the `jpctdchkinst` command, see the *HiCommand Tuning Manager Command Line Interface Guide*.

7.1.3 Canceling Setup of an Instance Environment

This section describes canceling setup of an instance environment. To cancel setup of multiple instance environments, you must repeat the following procedures for each environment:

- Delete the Agent's instance environment on the Agent host
- Delete the Agent's instance information on the Tuning Manager host

To delete the Agent's instance environment on the Agent host:

1. Find the instance name of Agent for RAID using the `jpcinslist` command. The command format is as follows:

   ```
   jpcinslist agtd
   ```

   For example, if the instance name is 35053, the command displays `35053`.

2. Stop the Agent for RAID service in the instance environment if it is active.
3. Delete the instance environment using the `jpcinsunsetup` command. The command format is as follows:

   `jpcinsunsetup agtd -inst` *instance-name*

   ***Example*:**

   To delete an instance environment whose instance name is 35053:

   ```
   jpcinsunsetup agtd -inst 35053
   ```

If the command is successful, the Windows services and the directories created during instance environment setup are deleted. If a service with the specified instance name is active, a message appears asking whether the service is to be stopped.

To delete the Agent's instance information on the Tuning Manager host:

1. On the Tuning Manager host, execute the `jpcctrl delete` command to delete the Agent's instance information.

   For example, to delete the instance information when the instance name is 35053, the host name is host03, the Agent Collector service ID is DA135053[host03], and the Agent Store service ID is DS135053[host03]:

   - Windows: `jpcctrl delete D?135053[host03] host=host03`
   - UNIX: `jpcctrl delete "D?135053[host03]" host=host03`

2. Restart the Collection Manager service.
3. Restart Performance Reporter.

7.1.4 Updating an Instance Environment

Updating an instance environment involves checking the instance name (using the `jpcinslist` command), then updating the instance environment (using the `jpcinssetup` command).

To update multiple instance environments, repeat the following procedure for each instance environment.

To update an instance environment:

1. Find the instance name by executing the `jpcinslist` command, specifying the service key of the Agent for RAID running in the instance environment.

   For example, to check the instance name of Agent for RAID, execute the following command:

   ```
   jpcinslist agtd
   ```

   If the specified instance name is 35053, the command displays `35053`.

2. Check the information of the instance environment to be updated (see Table 7.8 or

3. Table 7.9 at the end of these instructions).
4. If the Agent for RAID service is active in the instance environment that is to be updated, stop the service.
5. Execute the `jpcinssetup` command, specifying the service key and instance name of the Agent for RAID in the instance environment that you wish to update.

   For example, if you are updating the instance environment for the Agent for RAID with instance name FAB01, execute the following command:

   ```
   jpcinssetup agtd -inst 35053
   ```
6. If the service is still active in the instance environment that is to be updated when you execute the `jpcinssetup` command, a confirmation message is displayed to enable you to stop the service.

   If you stop the service, update processing resumes; if you do not stop the service, update processing is cancelled.
7. Enter the information shown in Table 7.8 or

8. Table 7.9 in accordance with the command's instructions to update the instance information.

   The current settings are displayed. When using the displayed value, or not specifying a value, press only the **Enter** key. When all entries are completed, the instance environment is updated.

9. Restart the service in the updated instance environment.

Table 7.8 Whether Instance Information for Agent for RAID can be Updated (TagmaStore AMS/WMS Series and Thunder Series)

Item	Description
`Storage Model`	You cannot update this value; the current setting is displayed only.
`IP Address or Host Name (Controller 0)`	You can update this value. Specify the IP address or host name assigned to `Controller 0` of the storage subsystem to be monitored. If you specify this item, the `Array Unit Name` specification is ignored. To leave this item unset, specify a space.
`IP Address or Host Name (Controller 1)`	You can update this value. Specify the IP address or host name assigned to `Controller 1` of the storage subsystem to be monitored. If you have set `IP Address or Host Name (Controller 0)` and the storage subsystem to be monitored has a dual controller configuration, this item is mandatory. To leave this item unset, specify a space.
`Array Unit Name`	You can update this value. Use this item to maintain compatibility with earlier versions If you want to update an instance, specify values in `IP Address or Host Name (Controller 0)` and `IP Address or Host Name (Controller 1)` to specify a storage subsystem to be monitored. To leave this item unset, specify a space.
`user ID`	You can update this value. When the storage subsystem to be monitored is the TagmaStore AMS/WMS series and Account Authentication is enabled, specify the user ID of the Agent for RAID account. For details on how to create this account, see section 7.1.1.2. To delete the set value and leave this setting blank, specify only a space character. Do not specify anything if the storage subsystem to be monitored does not support Account Authentication, or Account Authentication is not enabled.
`password`	You can update this value. Specify the password for the user ID set for `user ID`. The characters entered for this item are not displayed. You will be required to enter the same value twice. Do not specify anything if the storage subsystem to be monitored does not support Account Authentication, or Account Authentication is not enabled.

Table 7.9 Whether Instance Information for Agent for RAID can be Updated (TagmaStore USP and Lightning Series)

Item	Description
Storage Model	You cannot update this value. Only the set value is displayed.
Command Device File Name	You can update this value. For Windows hosts, specify the device file name or the partition GUID of the command device output by the jpctdlistraid command. For UNIX hosts, specify the device file name. Agent for RAID uses this command device to acquire information about the storage subsystem.
Mainframe Volume Monitoring	You can update this value. Select whether Agent for RAID monitors a logical device for which the emulation type used for a mainframe is set. ▪ To monitor a logical device for a mainframe, enter Y or y. ▪ To not monitor a logical device for a mainframe, enter N or n. If you enter a value other than Y, y, N, or n, the system prompts you to enter a value again. *Note:* If you want to monitor a logical device for a mainframe by changing the value from N or n to Y or y, the resources required for Agent Store and Main Console increase. Before changing the setting, re-estimate these resources, make sure that there are no problems, and then change the value.
Unassigned Open Volume Monitoring	This value can be updated. It specifies whether a logical device for which an open system emulation type has been set and that has not been mapped to a port is to be monitored. ▪ To monitor a logical device that has not been mapped to a port, enter Y or y. ▪ To not monitor a logical device that has not been mapped to a port, enter N or n. If you enter a value other than Y, y, N, or n, the system prompts you to enter a value again.

Notes:

- If you need to change an item that cannot be updated, you must delete the instance environment and then re-create it.
- To enable the Mainframe Volume Monitoring and Unassigned Open Volume Monitoring settings, the microcode version of the Lightning series needs to satisfy the following conditions.
  - For the Lightning 9900 series: 01-19-45 or later
  - For the Lightning 9900V series: 21-03 or later

Before you start operation in an instance environment you have updated, execute the jpctdchkinst command to verify the instance settings. The jpctdchkinst command references the set instance information and checks whether the settings allow information to be acquired from the storage subsystem monitored by Agent for RAID.

7.1.5 Setting up Agent for RAID in a Cluster System

This section describes setup for using Agent for RAID in a cluster system. Setup procedures differ for an executing node and standby node. Perform setup for the executing node first, and then for the standby node.

Note: If you set up an Agent in a logical host environment, the settings of the Agent in the physical host environment will not be inherited. For both logical and physical host environments, the instance environment is newly created when the instance environment is set.

7.1.5.1 Setting up the Executing Node's Logical Host Environment

Set up a logical host environment for Agent for RAID in the executing node. The procedure is as follows:

Note: Before performing setup, terminate all the services of Collection Manager and the Agent in the entire Tuning Manager system.

1. Mount the shared disk.

   Make sure that the shared disk is mounted. If it is not, use cluster software or a volume manager to mount it.

2. Set up a logical host environment for Agent for RAID.

   Execute the `jpchasetup create` command to create a logical host environment.

   This command copies required data to the shared disk, sets definitions for a logical host, and creates a logical host environment.

   To create a logical host environment:

   a) Execute the `jpchasetup create` command to create a logical host environment for Agent for RAID, as shown in the following example:

      Windows: `jpchasetup create agtd -lhost tm1-ha1 -d S:\tm1`

      UNIX: `jpchasetup create agtd -lhost tm1-ha1 -d /tm1`

      Use the `-lhost` option to specify the logical host name. In this example, `tm1-ha1` is specified as the logical host name. If DNS is used, specify the logical host name without the domain name.

      Specify the directory name of the shared disk as the environment directory name in the `-d` option. For example, if you specify `-d S:\tm1` on a Windows host, then `S:\tm1\jp1pc` will be created and a file for the logical host environment will be created. If you specify `-d /tm1` in a UNIX host, then `/tm1/jp1pc` will be created and a file for a logical host environment will be created.

   b) Execute the `jpchasetup list` command to check that the setting of the created logical host environment is correct, as shown in the following example:

      ```
      jpchasetup list all
      ```

3. Set the connection-target Tuning Manager.

   Execute the `jpcnshostname` command to specify the Tuning Manager that will manage Agent for RAID, as shown in the following example:

   ```
   jpcnshostname -s tm1 -lhost tm1-ha1
   ```

Use the `-s` option to specify the host name of connection-target Tuning Manager. When the connection-target Tuning Manager is running on a logical host, specify the logical host name of the connection-target Tuning Manager by using the `-s` option. In this example, the host name of Tuning Manager is specified as `tm1`.

Also, use the `-lhost` option to specify the logical host name of Agent for RAID. In this example, the logical host name of Agent for RAID is specified as `tm1-ha1`.

4. Set up an instance environment.

   a) Execute the `jpcinssetup` command to set up an instance environment for Agent for RAID, as shown in the following example:

      ```
      jpcinssetup agtd -lhost tm1-ha1 -inst 35053
      ```

      Use the `-lhost` option to specify the logical host name. In this example, the logical host name of Agent for RAID is specified as `tm1-ha1`, and the instance name is `35053`.

   b) Set up an instance environment.

      An instance environment is set up in the same way as for a non-cluster system. For details on what is to be set up, see section 7.1.2. If the monitored storage subsystem is TagmaStore USP or the Lightning Series, also see section 7.1.7.

5. Set up logical host environments for Collection Manager and other Agents.

   If you set up Collection Manager and any Agents other than Agent for RAID on the same logical host, set up logical host environments for them now.

   For details about the setup procedure for Collection Manager, see section 3.3.1. For details about the setup procedure for each Agent, see the section in this chapter that describes the setup procedure for your Agent.

6. Set a port number.

   You need to perform this setup only when Tuning Manager series programs are used in a network environment with a firewall. If communications among the Tuning Manager series programs are via a firewall, specify a port number by using the `jpcnsconfig port` command.

   For details about setting port numbers, see section 6.4. For details about the list of the port numbers, see the *HiCommand Tuning Manager Agent Administration Guide*.

7. Set an IP address.

   You can specify an IP address when using Tuning Manager series programs in a network environment with more than one LAN connected. To specify an IP address, edit the `jpchosts` file directly.

   For details on setting an IP address, see section 6.5.

   Note: After editing the `jpchosts` file, copy it from the executing node to the standby node.

8. Export the definitions of the logical host environment.

After creating a logical host environment for Agent for RAID, export the environment definitions to a file. All the definitions of the Collection Manager and Agents that are set up on the logical host will be output to the file. If you set up Collection Manager and any Agents other than Agent for RAID on the same logical host, export the definitions after you finish the setup.

To export the definitions of the logical host environment, execute the `jpchasetup export` command. This command will output, to an export file, the definitions of the logical host environment that has been created. The export file may have any name. For example, to export the definitions of the logical host environment to the `lhostexp.txt` file, execute the following command:

```
jpchasetup export -f lhostexp.txt
```

9. Copy the exported file to the standby node.

   Copy the file that you exported at step 8 from the executing node to the standby node.

10. Unmount the shared disk.

    End operations by unmounting the shared disk on the Windows host, or the file system on the UNIX host. To unmount the shared disk on the Windows host, use cluster software or a volume manager. To continue to use the shared disk, you do not have to unmount the shared disk or file system.

    Note specific to UNIX hosts: If there is a `jp1pc` directory in the specified environment directory, and there are files under the `jp1pc` directory despite the shared disk being unmounted, setup was performed while the shared disk was not mounted. In such a case, perform the following procedure to resolve the problem:

    a) Use the `tar` command to archive the `jp1pc` directory in the specified environment directory on the local disk.

    b) Mount the shared disk.

    c) If the specified environment directory does not exist on the shared disk, create the environment directory.

    d) From the `tar` file created at (a), extract the archived directory into the environment directory on the shared disk.

    e) Unmount the shared disk.

    f) Delete the `jp1pc` directory and its subordinates from the specified directory on the local disk.

7.1.5.2 Setting up the Standby Node's Logical Host Environment

Set up a logical host environment for Agent for RAID in the standby node. To set up the logical host environment, import, to the standby node, the definitions of the logical host environment that were exported at the executing node.

To import the definitions of the logical host environment for Agent for RAID, use the `jpchasetup import` command. If more than one Collection Manager or Agent has been set up on a single logical host, all the definitions are imported at the same time.

You do not have to mount the shared disk to execute this command.

To set up the logical host environment for the standby node:

1. Execute the `jpchasetup import` command to import the definitions of the logical host environment, as shown in the following example:

   ```
   jpchasetup import -f lhostexp.txt
   ```

   This command will change the environment settings for the standby node to those in the export file. This will set up the environment for starting the Collection Manager and Agents on the logical host.

   The fixed port number specified by the `jpcnsconfig port` command during setup for the executing node will also be imported.

2. Execute the `jpchasetup list` command to check that the setting of the logical host environment is the same as that for the executing node, as shown in the following example:

   ```
   jpchasetup list all
   ```

Note: After editing the `jpchosts` file, copy it from the executing node to the standby node.

7.1.5.3 Registering Agent for RAID in the Cluster Software

To use an Agent in a logical host environment, register it in the cluster software. This registration sets up the environment so that the Agent can be started or terminated via control from the cluster software.

This section describes how to register Agent for RAID in the cluster software separately for each OS.

For Windows

The example below describes the settings specified when registering Agent for RAID in the cluster software on a Windows host. The example uses Windows 2000 MSCS as the cluster software. For Agent for RAID, you need to register the following services in the cluster software.

Table 7.10 Agent for RAID Services to Be Registered in Cluster Software

Displayed Name	Service Name	Dependency
PFM - Agent Store for RAID *instance-name* [*lhost*]	JP1PCAGT_DS_*instance-name* [*lhost*]	IP address resource Physical disk resource
PFM - Agent for RAID *instance-name* [*lhost*]	JP1PCAGT_DA_*instance-name* [*lhost*]	Cluster resource for PFM – Agent Store for RAID *instance-name* [*lhost*]
PFM - Action Handler [*lhost*]	JP1PCMGR_PH [*lhost*]	IP address resource Physical disk resource

Note: Replace *lhost* by a logical host name. For example, if the instance name is `35053` and the logical host name is `tm1-ha1`, the displayed name of the service will be `PFM - Agent Store for RAID 35053 [tm1-ha1]`, and the service name will be `JP1PCAGT_DS_35053 [tm1-ha1]`.

The above services are registered as resources of MSCS. Set the resources as described below. The bold text below indicates items to be set for MSCS.

- Set **Type of resource** to **Generic service**.
- Set **Name**, **Service name** and **Dependency** as shown in Table 7.10.

  Note that a name in the *Displayed name* column is the name of a service, and a name in the *Service name* column is used to specify a service to be controlled from MSCS.
- Do not set **Startup parameter** and **Registry replication**.
- Set the **Details** page of the properties according to whether you want the system to fail over when a failure occurs with the Agent.

  Normally you specify settings so that no failover occurs. If you want the system to fail over, set this page as follows:
  - **Restart**: Select this item.
  - **Apply to a group**: Do not select this item.
  - **Threshold** for the number of restart retries: `3` (the recommended value)

Note: The cluster software controls the starting and stopping of the services to be registered. Thus, set **Type of startup** to **Manual** so that the services will not start automatically when the OS starts up. The type of startup for a service is set to **Manual** immediately after the service is set up by the `jpchasetup create` command.

For UNIX

The example below describes the settings specified when registering Agent for RAID in the cluster software on a UNIX host. There are four items required for registering an application in the UNIX cluster software: Startup, Stop, Monitoring and Forced stop.

Table 7.11 Control Method for Agent for RAID Registered in Cluster Software

Item	Description
Startup	Execute the following commands in the following order to start the Agent for RAID: `/opt/jp1pc/tools/jpcstart act lhost=`*logical-host-name* `/opt/jp1pc/tools/jpcstart agtd lhost=`*logical-host-name* `inst=`*instance-name* Start the Agent after the shared disk and the logical IP address become available.
Stop	Execute the following commands in the following order to stop the Agent for RAID: `/opt/jp1pc/tools/jpcstop agtd lhost=`*logical-host-name* `inst=`*instance-name* `/opt/jp1pc/tools/jpcstop act lhost=`*logical-host-name* Stop the Agent before the shared disk and the logical IP address are made unavailable. If services are stopped because of a failure, the return value of the `jpcstop` command is 3. Consider such a case as a normal end because the services are inactive. If the cluster software uses the return value to determine the execution result, make the return value 0.

Item	Description

Monitoring	Use the `ps` command to check that the processes below are running:
	`ps -ef | grep "`*process-name logical-host-name*`" | grep -v "grep` *process-to-be-monitored*`"`
	The following processes are to be monitored:
	`jpcagtd`, `agtd`/`jpcsto`, and `jpcah`
	For details about process names, see the *HiCommand Tuning Manager Agent Administration Guide*. In some situations, Agents need to be temporarily stopped. For such situations, provide a method for suppressing monitoring (such as not monitoring files while they are undergoing maintenance).

Forced stop	If forced stop is required, use the following command: `/opt/jp1pc/tools/jpcstop all lhost=`*logical-host-name* `kill=immediate` You can specify only `all` as a service key in the first argument. *Note*: By sending SIGKILL, this command performs a forced stop of all the processes of the Collection Manager and Agents running in the specified logical host environment. At this time, the Collection Manager and Agents are stopped not on the service level but on the logical host level. Forced stop must be set up only for the cases in which execution of an ordinary stop cannot stop the system.

Notes:

- The cluster software controls the starting and stopping of the Agent to be registered. Do not set up the Agent to start automatically when the OS starts.
- If the cluster software uses the return value of the `jpcstart` command or the `jpcstop` command to evaluate the execution result, specify the settings so that the return value of these commands is converted to the value expected by the cluster software. For details on the return values of the `jpcstart` command and the `jpcstop` command, see the *HiCommand Tuning Manager Command Line Interface Guide*.
- The length of characters to be displayed by the `ps` command varies with the OS. The length must be 47 or fewer characters when a logical host name and an instance name are added together. When you use the `ps` command for monitoring, make sure all the logical hosts are displayed by the `ps` command beforehand. If not all the characters are displayed, specify settings so that only the displayed characters are monitored.

7.1.5.4 Checking Starting and Stopping

To check normal operation, use the cluster software to start and stop Agent for RAID at each node.

7.1.6 Canceling Setup in a Cluster System

This section describes how to cancel setup of Agent for RAID in a cluster system. Procedures for canceling setup differ for an executing node and standby node. Cancel the setup of Agent for RAID first for the executing node and then for the standby node.

Note: Before canceling setup, stop all the services of Collection Manager and the Agents that are running on the executing and standby nodes whose setup is to be canceled.

7.1.6.1 Canceling Setup of the Executing Node's Logical Host Environment

In the executing node, cancel setup of the logical host environment of Agent for RAID. The procedure is as follows:

1. Mount the shared disk.

   Make sure that the shared disk is mounted. If it is not, use cluster software or a volume manager to mount it.

   Note specific to UNIX hosts: If there is a `jp1pc` directory in the specified environment directory, and there are files under the `jp1pc` directory despite the shared disk being unmounted, setup was performed while the shared disk was not mounted. In such a case, carry out the following procedure to resolve the problem:

   a) Use the `tar` command to archive the `jp1pc` directory in the environment directory of the logical host for which you want to cancel setup on the local disk.

   b) Mount the shared disk.

   c) If the environment directory of the logical host for which you want to cancel setup does not exist on the shared disk, create the environment directory.

   d) Expand the `tar` file in the environment directory of the logical host on the shared disk for which you want to cancel setup.

   e) Unmount the shared disk.

   f) Delete the `jp1pc` directory and its subordinates that are in the environment directory on the logical host whose setup you want to cancel, on the local disk.

2. Cancel setup of a port number.

   This procedure is required only when a port number was specified by the `jpcnsconfig port` command during setup in an environment with a firewall.

   To cancel setup of a port number, set "`0`" as the port number. For details about setting port numbers, see section 6.4.

3. Cancel setup of Agent for RAID in a logical host environment.

   Execute the `jpchasetup delete` command to delete the logical host environment, as shown in the following example. In this example, the logical host name of Agent for RAID is specified as `tm1-ha1` and the instance name as `35053`.

Note: If you delete a logical host environment while the shared disk is not mounted, only the setting of the logical host on the physical host will be deleted and the directories and files on the shared disk will not be deleted. In such a case, you must mount the shared disk and manually delete the `jp1pc` directory under the environment directory.

To delete the logical host environment:

a) Execute the `jpchasetup list` command to check the settings of the logical host environment to be deleted, such as the logical host name and the path to the shared disk, as shown in the following example:

```
jpchasetup list all -lhost tm1-ha1
```

b) Execute the `jpcinsunsetup` command to delete the instance environment of Agent for RAID, as shown in the following example:

```
jpcinsunsetup agtd -lhost tm1-ha1 -inst 35053
```

When you execute the `jpcinsunsetup` command, the setting to start up the instances on the logical host will be deleted. At the same time, the files for the instances will be deleted from the shared disk.

c) Execute the `jpchasetup delete` command to delete the logical host environment of Agent for RAID, as shown in the following example:

```
jpchasetup delete agtd -lhost tm1-ha1
```

When you execute the `jpchasetup delete` command, the setting to start up Agent for RAID on the logical host will be deleted. At the same time, the file for the logical host will be deleted from the shared disk.

d) Execute the `jpchasetup list` command to check that Agent for RAID has been deleted from the logical host environment, as shown in the following example:

```
jpchasetup list all
```

4. Cancel setup of the logical host environments for Collection Manager and other Agents.

   If you cancel setup of Collection Manager and any Agents other than Agent for RAID from the same logical host, cancel setup of the logical host environments for them now.

   For details about the procedure for canceling setup of Collection Manager, see section 8.1.3. For details about the procedure for canceling setup of each Agent, see the section in this chapter that describes the procedure for your Agent.

5. Export the definitions of the logical host environment.

   After deleting the logical host environment for Agent for RAID, export the environment definitions to a file.

   To export the definitions of the logical host environment, use the `jpchasetup export` command. This command will output the definitions of the logical host environments for Collection Manager and the Agents to an export file. The export file may have any name. For example, to export the definitions of the logical host environment to the `lhostexp.txt` file, execute the following command:

   ```
   jpchasetup export -f lhostexp.txt
   ```

   Collection Manager and the Agents make the environment of the executing node match that of the standby node by exporting and importing the environment definitions.

If you import to the standby node the environment definitions exported at the executing node (where environment definitions of Collection Manager and the Agents were deleted), they will be compared with the existing environment definitions of the standby node (where the definitions of Collection Manager and the Agents remain without being deleted). Then, differences (that is, the environment definitions of Collection Manager and the Agents that were deleted at the executing node) will be deleted from the standby node.

6. Copy the exported file to the standby node.

   Copy the logical host environment definition file that you exported at step 5 from the executing node to the standby node.

7. Unmount a shared disk.

   End operations by unmounting the shared disk on the Windows host, or the file system on the UNIX host. To unmount the shared disk on the Windows host, use cluster software or a volume manager. To continue to use the shared disk, you do not have to unmount the shared disk or file system.

7.1.6.2 Canceling Setup of the Standby Node's Logical Host Environment

Cancel setup of the logical host environment for Agent for RAID at the standby node. To cancel setup, copy the definitions of the logical host environment exported at the executing node to the standby node.

You do not have to unmount the shared disk to cancel setup at the standby node.

To cancel setup of the logical host environment at the standby node:

1. Execute the `jpchasetup import` command to import the definitions of the logical host environment, as shown in the following example:

   ```
   jpchasetup import -f lhostexp.txt
   ```

   This command will change the environment settings for the standby node to those in the export file. This means the setting to start Agent for RAID of the logical host will be deleted. If setup is canceled for the Collection Manager and Agents on other logical hosts, those settings will also be deleted.

   The setup for the fixed port number specified by the `jpcnsconfig port` command during setup will also be canceled.

2. Execute the `jpchasetup list` command to check that the setting of the logical host environment is the same as that for the executing node, as shown in the following example:

   ```
   jpchasetup list all
   ```

7.1.6.3 Unregistering the Cluster Software

Delete, from the cluster software, the settings related to Agent for RAID on a logical host. For details on the deletion procedure, see the documentation for the cluster software.

7.1.6.4 Deleting Settings at Tuning Manager

Delete the definitions related to Agent for RAID whose setup is to be canceled.

To delete the definitions:

1. Delete the Tuning Manager's Agent information.

   For example, if Tuning Manager is running on the logical host `tm1-ha2`, and Agent for RAID is running on the logical host `tm1-ha1`, execute the following command in Tuning Manager:

   `jpcctrl delete` ***service-ID*** `host=tm1-ha1 lhost=tm1-ha2`

   In *service-ID*, specify the service ID of the Agent to be deleted.

2. Restart the Collection Manager services.
3. Restart Performance Reporter.

7.1.7 Monitoring TagmaStore USP or Lightning Series in a Cluster System

To monitor TagmaStore USP or the Lightning series, specify the device file name of the command device of the storage subsystem to be monitored when you set up an instance environment. In a cluster system, this device file name sometimes differs between the executing node and the standby node. Follow the setup procedure below.

Storing a Cluster Definition File on a Physical Node

Prepare a cluster definition file (`jpcagtha.ini`) that defines the device file names of the command devices to be detected by the physical nodes for the executing and standby nodes. Then, store the file in the executing and standby nodes.

- File name

  Name the cluster definition file `jpcagtha.ini`

- File directory

  Store the cluster definition file in the following directory:

  Windows: *Agent for RAID installation-folder*`\agtd\agent`

  UNIX: `/opt/jp1pc/agtd/agent`

- Timing of storing a file

  Store the cluster definition file in the specified directory before starting Agent for RAID.

  If you store a file while Agent for RAID is starting or after it has started, the contents of the file will not be valid. Updating a file that has been already stored will not make the updated contents valid.

- Definitions in the file

  In the cluster definition file, define the device file names of the command devices that are detected by the physical nodes. Define a device file name for each logical host and for each instance by using the following format:

```
[logical-host-name-1]
[[instance-name-11]]
HACMDDEV=command-device-file-name-11
[[instance-name-12]]
HACMDDEV=command-device-file-name-12
...
...
[logical-host-name-2]
[[instance-name-21]]
HACMDDEV=command-device-file-name-21
[[instance-name-22]]
HACMDDEV=command-device-file-name-22
...
...
```

  Specify the name of the logical host that starts up Agent for RAID. Enclose the name in square brackets `[ ]`. The section up to the next `[ ]` is for a logical host. In the logical host section, specify the names of the instances to be started by enclosing them in double square brackets `[[ ]]`. The section up to the next `[[ ]]` or `[ ]` is for an instance. In the instance section, specify `HACMDDEV=` followed by the device file name of the command device of the storage subsystem to be monitored.

- Examples of contents and format of definitions in the file

  The following examples show the contents to be defined in the cluster definition file and the format, separately for each OS.

  For Windows:

  Assume the logical host name is `tm1-ha1raid` and the instance name is `35053`. Also assume the device file name of the command device to be detected by the executing node is `\\?\Volume{2fa19e04-66d0-11d8-9540-806d6172696f}` and the device file name of the command device to be detected by the standby node is `\\?\Volume{2fa19e14-66d0-11d8-9540-806d6172696f}`. In this case, define the files as follows:

  – Contents of the cluster definition file (*Agent for RAID installation-folder*`\agtd\agent\jpcagtha.ini`) to be stored in the executing node:

    ```
    [tm1-ha1raid]

    [[35053]]

    HACMDDEV=\\?\Volume{2fa19e04-66d0-11d8-9540-806d6172696f}
    ```

  – Contents of the cluster definition file (*Agent for RAID installation-folder*`\agtd\agent\jpcagtha.ini`) that is stored in the standby node:

    ```
    [tm1-ha1raid]

    [[35053]]

    HACMDDEV=\\?\Volume{2fa19e14-66d0-11d8-9540-806d6172696f}
    ```

For UNIX:

Assume the logical host name is `tm1-ha1raid` and the instance name is `35053`. Also assume the device file name of the command device to be detected by the executing node is `/dev/rdsk/c1t1d1` and the device file name of the command device to be detected by the standby node is `/dev/rdsk/c2t2d2`. In this case, define the files as follows:

- Contents of the cluster definition file (`/opt/jp1pc/agtd/agent/jpcagtha.ini`) to be stored in the executing node:

  ```
  [tm1-ha1raid]
  [[35053]]
  HACMDDEV=/dev/rdsk/c1t1d1
  ```

- Contents of the cluster definition file (`/opt/jp1pc/agtd/agent/jpcagtha.ini`) that is stored in the standby node:

  ```
  [tm1-ha1raid]
  [[35053]]
  HACMDDEV=/dev/rdsk/c2t2d2
  ```

Specifying the Keyword for Referencing the Cluster Definition File

When you set up an instance environment by using the `jpcinssetup` command, specify the keyword `HACMDDEV` for `Command Device File Name`. This keyword refers to the cluster definition file that is stored in a physical node.

7.2 Setting up Agent for RAID Map

This section describes the setup that is required to collect configuration information for a system that belongs to an IP address, other than that detected by the OS, by using the System Configuration Detail (PD) records of Agent for RAID Map.

Typically, a System Configuration Detail (PD) record collects system configuration information for a system whose IP address is detected automatically by an OS command (the `ipconfig` command in Windows, and the `ifconfig` command in UNIX).

If you set an IP address in the IP address setting file (`jpcagteparm.ini`) before you start Agent for RAID Map, you can collect system configuration information for the system that has the specified IP address.

Creating an IP Address Setting File

Before you start Agent for RAID Map, create an IP address setting file with the name `jpcagteparm.ini`, and save it in the following directory:

- Windows: *installation-folder*`\agte\agent`
- UNIX: `/opt/jp1pc/agte/agent`

Note: If you attempt to save the file while Agent for RAID Map is starting (or after it has started), the file will be saved but the file contents will not be valid, and cannot be made valid by updating the contents.

Reviewing the File Definition Details

In the IP address setting file, you define the IP address of the system whose system configuration information is to be collected. In the file, use the following format to define the address:

```
[Agent]
ip address=xxx.xxx.xxx.xxx
```

Specify the IP address in *xxx*.*xxx*.*xxx*.*xxx*. Use decimal integers from 0 to 255 for each *xxx* and a period (.) as a delimiter. If multiple IP addresses are specified, the IP address specified first is valid.

Note the following points about defining the IP address setting file:

- The following IP addresses cannot be specified:
  - `0.0.0.0`
  - `127.0.0.1`
- If the file format is wrong or if an inappropriate IP address is specified in the file, Agent for RAID Map will acquire the IP address in the usual manner, and will attempt processing. When this occurs, a warning message is output.

7.3 Setting up Agent for SAN Switch

This section explains the setup that is required before you can use Agent for SAN Switch. Please review the following items before you start to set up Agent for SAN Switch.

- When monitoring fabrics consisting of Brocade switches only:
  - Units for instance construction

    Construct one instance for each fabric.
  - Number of sessions

    Only one Proxy Switch session is used for each instance of Agent for SAN Switch.

    If Agent for SAN Switch has already established a session with a Proxy Switch, other sessions cannot be established with that Proxy Switch.
- When monitoring fabrics consisting of McDATA switches only:
  - Units for instance construction

    When the build number (*x*) of EFCM 07.02.00 *x* is 8, you can construct one instance for each EFCM. When the build number of EFCM 07.02.00 *x* is 9 or larger, you can construct three instances for each EFCM. For EFCM 08.05.00, 08.06.00, 08.07.00, 08.07.01, 08.08.00, 08.09.00, 08.09.01, and 09.00.00, regardless of the build number, you can construct three instances.

    When constructing an instance environment, you can specify whether multiple EFCM-managed fabrics are to be monitored as one fabric, or only a specific EFCM-managed fabric is to be monitored.
    - When multiple EFCM-managed fabrics are to be monitored as one fabric:
      If you specify `ALL` in `Target Switch WWN`, all the EFCM-managed fabrics will be monitored.
    - When only a specific EFCM-managed fabric is to be monitored:
      Only the fabric that contains the switch specified in `Target Switch WWN` will be monitored.
  - Number of sessions

    When the build number (*x*) of EFCM 07.02.00 *x* is 8, you can establish one session. When the build number of EFCM 07.02.00 *x* is 9 or larger, you can establish three sessions. For EFCM 08.05.00, 08.06.00, 08.07.00, 08.07.01, 08.08.00, 08.09.00, 08.09.01, and 09.00.00, regardless of the build number, you can establish three sessions.

    If EFCM has already established the maximum number of sessions, other sessions cannot be established with that EFCM.
- When monitoring fabrics consisting of Brocade and McDATA switches:

  Units for instance construction

  To monitor both Brocade and McDATA switches, construct one instance for the Brocade switches, and one instance for the McDATA switches. You must construct the instance environment for Brocade switches and McDATA switches separately to monitor them. Note that you cannot monitor the fabrics that include an unsupported switch.

7.3.1 Setting up an Instance Environment

You must specify instance information for the fabric that Agent for SAN Switch will monitor. Table 7.12 lists the instance information items that are to be specified. Check this information before you start the setup procedure.

Table 7.12 Instance Information for Agent for SAN Switch

Item	Description	
	Brocade Switch	McDATA Switch
`Switch Vendor`	Use the default value (`1`).	Specify `2`.
`IP Address`	Specify the Proxy Switch IP address (up to 15 bytes) in dotted decimal notation. `See` *Note 1*	Specify the Fabric Management Server IP address (up to 15 bytes) in dotted decimal notation.
`Fabric Name` `See` *Note 2*	Specify a name for the fabric to be monitored (1-31 bytes, using alphanumeric characters). The default value is the instance name.	Specify a name for the fabric to be monitored (1-31 bytes, using alphanumeric characters). The default value is the instance name.
`Login ID`	Specify a login ID (1-512 bytes, using alphanumeric characters) required to access the Proxy Switch.	Specify a login ID (1-512 bytes, using alphanumeric characters) required to access EFCM.
`Password`	Specify a password required to access Proxy Switch. (Use up to 250 bytes of single-byte characters, including the space character. These characters are case-sensitive.) If you do not want to set a password, specify a space character only.	Specify a password required to access EFCM. (Use up to 250 bytes of single-byte characters, including the space character. These characters are case-sensitive.) If you do not want to set a password, specify a space character only.
`Target Switch WWN`	Not applicable.	When all EFCM-managed fabrics are to be monitored, specify `ALL` (not case sensitive). When only a specific fabric is to be monitored, specify the WWN of the switch that consists of the fabric.

Note 1: If you specify SilkWorm 12000 or SilkWorm 24000 for a Proxy Switch, specify the IP address of a logical switch. When multiple switch ports are bundled and managed as one switch, the switch is called a **logical switch**.

When you create an instance environment for multiple logical switches, specify the settings as follows:

- If you use either logical switch 0 or logical switch 1, specify the IP address of the selected logical switch.
- If you use both logical switch 0 and logical switch 1 and they belong to the same fabric, specify the IP address of logical switch 0 or logical switch 1.
- If you use both logical switch 0 and logical switch 1 and they belong to different fabrics, create an instance environment for each fabric and then specify the IP address of each logical switch.

Note 2: The instance name is specified in `Fabric Name` by default. If the length of the specified instance name exceeds the maximum of 31 bytes for `Fabric Name`, then the instance name cannot be specified. Specify alphanumeric characters totaling no more than 31 bytes for `Fabric Name`.

Use the `jpcinssetup` command to construct an instance environment.

To construct an instance environment:

1. Execute the `jpcinssetup` command with the service key and instance name (no more than 32 bytes) specified.

   For example, to construct an instance environment for the instance named FAB01 for Agent for SAN Switch, execute the following command:

   ```
   jpcinssetup agtw -inst FAB01
   ```

   Note: Use an instance name that is unique among all the names of the Agent instances on the network.

2. Set up the instance information for the fabric you will monitor.

   Enter the information shown in Table 7.12, in accordance with the command's instructions. To use the displayed default value, press the **Enter** key.

   The fabric to be monitored is specified depending on the settings for instance information as follows:

   - When monitoring the fabric consisting of Brocade switches only, or when monitoring Brocade switches from the fabric consisting of both Brocade and McDATA switches (when 1 is specified in Switch Vendor):
     The fabric to be monitored is the fabric where the Proxy Switch specified in `IP Address` belongs.
   - When monitoring the fabric consisting of McDATA switches only, or when monitoring McDATA switches from the fabric consisting of both Brocade and McDATA switches (when 2 is specified in Switch Vendor):
     - If you specify a specific fabric in Target Switch WWN:

       The fabric to be monitored is the specific fabric specified in Target Switch WWN from among fabrics managed by EFCM running on the Fabric Management Server specified in IP Address.
     - If you specify ALL in Target Switch WWN:

       The fabrics to be monitored are all the fabrics managed by EFCM running on the Fabric Management Server specified in IP Address.

       In this case, multiple fabrics are collectively recognized as one fabric.

3. To perform the operation with multiple instances, repeat steps 1 and 2 for each instance.

7.3.1.1 About the Constructed Instance Environment

Once you have entered all items, the instance environment is constructed. Described below are the organization of directories for instance environments and the service ID for an instance environment.

Organization of Directories for Instance Environments

Instance environments are constructed under the following directory:

- For Windows: *installation-folder*\agtw
- For UNIX: /opt/jp1pc/agtw

Table 7.13 shows the organization of the directories for instance environments.

Table 7.13 Organization of Directories for Instance Environments (Agent for SAN Switch)

Directory and File Names			Description
agent	*instance-name*	jpcagt.ini	Startup-information file of the Agent Collector service
		jpcagt.ini.model See *Note*	Model file for the startup-information file of the Agent Collector service
		log	Directory for storing internal log files of the Agent Collector service
store	*instance-name*	*.DAT	Data model definition file
		backup	Default directory for backing up the database
		dump	Default directory for exporting the database
		jpcsto.ini	Startup-information file of the Agent Store service
		jpcsto.ini.model See *Note*	Model file for the startup-information file of the Agent Store service
		log	Directory for storing internal log files of the Agent Store service

Note: Use this file to restore the settings that were in effect before the instance environment was constructed.

Service ID for an Instance Environment

The following is the service ID for an instance environment:

product-ID function-ID instance-number instance-name [*host-name*]

The *instance-name* is specified with the jpcinssetup command. For details about service IDs, see the *HiCommand Tuning Manager Agent Administration Guide*.

Windows Service Name for an Instance Environment

The following are Windows service names for an instance environment:

- Agent Collector: `PFM - Agent for SANSwitch` *instance-name*
- Agent Store: `PFM - Agent Store for SANSwitch` *instance-name*

The *instance-name* is specified with the `jpcinssetup` command. For details about the Windows service name, see the *HiCommand Tuning Manager Agent Administration Guide*.

7.3.2 Canceling Setup of an Instance Environment

This section describes canceling setup of an instance environment. To cancel setup of multiple instance environments, you must repeat the following procedures for each environment:

- Delete the Agent's instance environment on the Agent host
- Delete the Agent's instance information on the Tuning Manager host

To delete the Agent's instance environment on the Agent host:

1. Find the instance name of Agent for SAN Switch using the `jpcinslist` command. The command format is as follows:

   `jpcinslist agtw`

   For example, if the instance name is FAB01, the command displays `FAB01`.

2. Stop the Agent for SAN Switch service in the instance environment if it is active.
3. Delete the instance environment using the `jpcinsunsetup` command. The command format is as follows:

   `jpcinsunsetup agtw -inst` *instance-name*

   Example:

   To delete an instance environment whose instance name is FAB01:

   `jpcinsunsetup agtw -inst FAB01`

   If the command is successful, the Windows services and the directories created during instance environment setup are deleted. If a service with the specified instance name is active, a message appears asking whether the service is to be stopped.

To delete the Agent's instance information on the Tuning Manager host:

1. On the Tuning Manager host, execute the `jpcctrl delete` command to delete the Agent's instance information.

   For example, to delete the instance information when the instance name is FAB01, the host name is host03, the Agent Collector service ID is WA1FAB01[host03], and the Agent Store service ID is WS1FAB01[host03]:

   - For Windows: `jpcctrl delete W?1FAB01[host03] host=host03`
   - For UNIX: `jpcctrl delete "W?1FAB01[host03]" host=host03`

2. Restart the Collection Manager service.
3. Restart Performance Reporter.

7.3.3 Updating an Instance Environment

Updating an instance environment involves checking the instance name (using the `jpcinslist` command), then updating the instance environment (using the `jpcinssetup` command).

To update multiple instance environments, repeat the following procedure for each instance environment.

To update an instance environment:

1. Find the instance name by executing the `jpcinslist` command, specifying the service key of the Agent for SAN Switch running in the instance environment.

   For example, to check the instance name of Agent for SAN Switch, execute the following command:

   ```
   jpcinslist agtw
   ```

   If the specified instance name is FAB01, the command displays `FAB01`.

2. Check the information of the instance environment to be updated (see Table 7.14 at the end of these instructions).

3. If the Agent for SAN Switch service is active in the instance environment that is to be updated, stop the service.

4. Execute the `jpcinssetup` command, specifying the service key and instance name of the Agent for SAN Switch in the instance environment that you wish to update.

   For example, if you are updating the instance environment for the Agent for SAN Switch with instance name FAB01, execute the following command:

   ```
   jpcinssetup agtw -inst FAB01
   ```

5. If the service is still active in the instance environment that is to be updated when you execute the `jpcinssetup` command, a confirmation message is displayed to enable you to stop the service.

   If you stop the service, update processing resumes; if you do not stop the service, update processing is cancelled.

6. Enter the information shown in Table 7.14 in accordance with the command's instructions to update the instance information.

   The current settings are displayed (except for the `password`). To use the displayed value, press the **Enter** key. When all entries are completed, the instance environment is updated.

7. Restart the service in the updated instance environment.

Table 7.14 Whether the Instance Information for Agent for SAN Switch Can be Updated

Item	Description	
	Brocade Switch	McDATA Switch
Switch Vendor	This value can be updated. Specify 1.	This value can be updated. Specify 2.
IP Address	This value can be updated. Specify the	This value can be updated. Specify the

	Proxy Switch IP address (up to 15 bytes) in dotted decimal notation.	Fabric Management Server IP address (up to 15 bytes) in dotted decimal notation.
Fabric Name	This value can be updated. Specify a name for the fabric to be monitored (1-31 bytes, using alphanumeric characters). The default value is the instance name.	This value can be updated. Specify a name for the fabric to be monitored (1-31 bytes, using alphanumeric characters). The default value is the instance name.
Login ID	This value can be updated. Specify the login ID (1-512 bytes, using alphanumeric characters) required to access the Proxy Switch.	This value can be updated. Specify the login ID (1-512 bytes, using alphanumeric characters) required to access EFCM.
Password	This value can be updated. Specify a password required to access Proxy Switch. (Use up to 250 bytes of single-byte characters, including the space character. These characters are case-sensitive.) If you do not want to set a password, specify a space character only.	This value can be updated. Specify a password required to access EFCM. (Use up to 250 bytes of single-byte characters, including the space character. These characters are case-sensitive.) If you do not want to set a password, specify a space character only.
Target Switch WWN	Not applicable.	This value can be updated. When all EFCM-managed fabrics are to be monitored, specify ALL (not case sensitive).

7.3.4 Setting up Agent for SAN Switch in a Cluster System

This section describes setup for using Agent for SAN Switch in a cluster system. Setup procedures differ for an executing node and standby node. Perform setup for the executing node first, and then for the standby node.

Note: If you set up an Agent in a logical host environment, the settings of the Agent in the physical host environment will not be inherited. For both logical and physical host environments, the instance environment is newly created when the instance environment is set.

7.3.4.1 Setting up the Executing Node's Logical Host Environment

Set up a logical host environment for Agent for SAN Switch in the executing node. The procedure is as follows:

Note: Before performing setup, terminate all the services of Collection Manager and the Agent in the entire Tuning Manager system.

1. Mount the shared disk.

   Make sure that the shared disk is mounted. If it is not, use cluster software or a volume manager to mount it.

2. Set up a logical host environment for Agent for SAN Switch.

   Execute the `jpchasetup create` command to create a logical host environment.

   This command copies required data to the shared disk, sets definitions for a logical host, and creates a logical host environment.

   To create a logical host environment:

   a) Execute the `jpchasetup create` command to create a logical host environment for Agent for SAN Switch, as shown in the following example:

      Windows: `jpchasetup create agtw -lhost tm1-ha1 -d S:\jp1`

      UNIX: `jpchasetup create agtw -lhost tm1-ha1 -d /jp1`

      Use the `-lhost` option to specify the logical host name. In this example, `tm1-ha1` is specified as the logical host name. If DNS is used, specify the logical host name without the domain name.

      Specify the directory name of the shared disk as the environment directory name in the `-d` option. For example, if you specify `-d S:\tm1` on a Windows host, then `S:\tm1\jp1pc` will be created and a file for the logical host environment will be created. If you specify `-d /tm1` in a UNIX host, then `/tm1/jp1pc` will be created and a file for a logical host environment will be created.

   b) Execute the `jpchasetup list` command to check that the setting of the created logical host environment is correct, as shown in the following example:

      ```
      jpchasetup list all
      ```

3. Set the connection-target Tuning Manager.

   Execute the `jpcnshostname` command to specify the Tuning Manager that will manage Agent for SAN Switch, as shown in the following example:

   ```
   jpcnshostname -s tm1 -lhost tm1-ha1
   ```

   Use the `-s` option to specify the host name of connection-target Tuning Manager. When the connection-target Tuning Manager is running on a logical host, specify the logical host name of the connection-target Tuning Manager by using the `-s` option. In this example, the host name of Tuning Manager is specified as `tm1`.

   Also, use the `-lhost` option to specify the logical host name of Agent for SAN Switch. In this example, the logical host name of Agent for SAN Switch is specified as `tm1-ha1`.

4. Set up an instance environment.

a) Execute the `jpcinssetup` command to set up an instance environment for Agent for SAN Switch, as shown in the following example:

```
jpcinssetup agtw -lhost tm1-ha1 -inst FAB01
```

Use the `-lhost` option to specify the logical host name. In this example, the logical host name of Agent for SAN Switch is specified as `tm1-ha1`, and the instance name is `FAB01`.

b) Set up an instance environment.

An instance environment is set up in the same way as for a non-cluster system. For details on what is to be set up, see section 7.3.1.

5. Set up logical host environments for Collection Manager and other Agents.

If you set up Collection Manager and any Agents other than Agent for SAN Switch on the same logical host, set up logical host environments for them now.

For details about the setup procedure for Collection Manager, see section 3.3.1. For details about the setup procedure for each Agent, see the section in this chapter that describes the setup procedure for your Agent.

6. Set a port number.

You need to perform this setup only when Tuning Manager series programs are used in a network environment with a firewall. If communications among the Tuning Manager series programs are via a firewall, specify a port number by using the `jpcnsconfig port` command.

For details about setting port numbers, see section 6.4. For details about the list of the port numbers, see the *HiCommand Tuning Manager Agent Administration Guide*.

7. Set an IP address.

You can specify an IP address when using Tuning Manager series programs in a network environment with more than one LAN connected. To specify an IP address, edit the `jpchosts` file directly.

For details on setting an IP address, see section 6.5.

Note: After editing the `jpchosts` file, copy it from the executing node to the standby node.

8. Export the definitions of the logical host environment.

After creating a logical host environment for Agent for SAN Switch, export the environment definitions to a file. All the definitions of the Collection Manager and Agents that are set up on the logical host will be output to the file. If you set up Collection Manager and any Agents other than Agent for SAN Switch on the same logical host, export the definitions after you finish the setup.

To export the definitions of the logical host environment, execute the `jpchasetup export` command. This command will output, to an export file, the definitions of the logical host environment that has been created. The export file may have any name. For example, to export the definitions of the logical host environment to the `lhostexp.txt` file, execute the following command:

```
jpchasetup export -f lhostexp.txt
```

9. Copy the exported file to the standby node.

Copy the file that you exported at step 8 from the executing node to the standby node.

10. Unmount the shared disk.

    End operations by unmounting the shared disk on the Windows host, or the file system on the UNIX host. To unmount the shared disk on the Windows host, use cluster software or a volume manager. To continue to use the shared disk, you do not have to unmount the shared disk or file system.

    Note specific to UNIX hosts: If there is a `jp1pc` directory in the specified environment directory, and there are files under the `jp1pc` directory despite the shared disk being unmounted, setup was performed while the shared disk was not mounted. In such a case, perform the following procedure to resolve the problem:

    a) Use the `tar` command to archive the `jp1pc` directory in the specified environment directory on the local disk.

    b) Mount the shared disk.

    c) If the specified environment directory does not exist on the shared disk, create the environment directory.

    d) From the `tar` file created at (a), extract the archived directory into the environment directory on the shared disk.

    e) Unmount the shared disk.

    f) Delete the `jp1pc` directory and its subordinates from the specified directory on the local disk.

7.3.4.2 Setting up the Standby Node's Logical Host Environment

Set up a logical host environment for Agent for SAN Switch in the standby node. To set up the logical host environment, import, to the standby node, the definitions of the logical host environment that were exported at the executing node.

To import the definitions of the logical host environment for Agent for SAN Switch, use the `jpchasetup import` command. If more than one Collection Manager or Agent has been set up on a single logical host, all the definitions are imported at the same time.

You do not have to mount the shared disk to execute this command.

To set up the logical host environment for the standby node:

1. Execute the `jpchasetup import` command to import the definitions of the logical host environment, as shown in the following example:

   ```
   jpchasetup import -f lhostexp.txt
   ```

   This command will change the environment settings for the standby node to those in the export file. This will set up the environment for starting the Collection Manager and Agents on the logical host.

   The fixed port number specified by the `jpcnsconfig port` command during setup for the executing node will also be imported.

2. Execute the `jpchasetup list` command to check that the setting of the logical host environment is the same as that for the executing node, as shown in the following example:

   ```
   jpchasetup list all
   ```

Note: After editing the `jpchosts` file, copy it from the executing node to the standby node.

7.3.4.3 Registering Agent for SAN Switch in the Cluster Software

To use an Agent in a logical host environment, register it in the cluster software. This registration sets up the environment so that the Agent can be started or terminated via control from the cluster software.

This section describes how to register Agent for SAN Switch in the cluster software separately for each OS.

For Windows

The example below describes the settings specified when registering Agent for SAN Switch in the cluster software on a Windows host. The example uses Windows 2000 MSCS as the cluster software. For Agent for SAN Switch, you need to register the following services in the cluster software.

Table 7.15 Agent for SAN Switch Services to Be Registered in Cluster Software

Displayed Name	Service Name	Dependency
PFM - Agent Store for SAN Switch *instance-name* [*lhost*]	JP1PCAGT_WS_*instance-name* [*lhost*]	IP address resource Physical disk resource
PFM - Agent for SAN Switch *instance-name* [*lhost*]	JP1PCAGT_WA_*instance-name* [*lhost*]	Cluster resource for PFM – Agent Store for SAN Switch *instance-name* [*lhost*]
PFM - Action Handler [*lhost*]	JP1PCMGR_PH [*lhost*]	IP address resource Physical disk resource

Note: Replace *lhost* by a logical host name. For example, if the instance name is `FAB01` and the logical host name is `tm1-ha1`, the displayed name of the service will be `PFM - Agent Store for SAN Switch FAB01 [tm1-ha1]`, and the service name will be `JP1PCAGT_WS_FAB01 [tm1-ha1]`.

The above services are registered as resources of MSCS. Set the resources as described below. The bold text below indicates items to be set for MSCS.

- Set **Type of resource** to **Generic service**.
- Set **Name**, **Service name** and **Dependency** as shown in Table 7.15.

  Note that a name in the *Displayed name* column is the name of a service, and a name in the *Service name* column is used to specify a service to be controlled from MSCS.

- Do not set **Startup parameter** and **Registry replication**.
- Set the **Details** page of the properties according to whether you want the system to fail over when a failure occurs with the Agent.

  Normally you specify settings so that no failover occurs. If you want the system to fail over, set this page as follows:

  - **Restart**: Select this item.
  - **Apply to a group**: Do not select this item.
  - **Threshold** for the number of restart retries: `3` (the recommended value)

Note: The cluster software controls the starting and stopping of the services to be registered. Thus, set **Type of startup** to **Manual** so that the services will not start automatically when the OS starts up. The type of startup for a service is set to **Manual** immediately after the service is set up by the `jpchasetup create` command.

For UNIX

The example below describes the settings specified when registering Agent for SAN Switch in the cluster software on a UNIX host. There are four items required for registering an application in the UNIX cluster software: Startup, Stop, Monitoring and Forced stop.

Table 7.16 Control Method for Agent for SAN Switch Registered in Cluster Software

Item	Description
Startup	Execute the following commands in the following order to start the Agent for SAN Switch: `/opt/jp1pc/tools/jpcstart act lhost=`*logical-host-name* `/opt/jp1pc/tools/jpcstart agtw lhost=`*logical-host-name* `inst=`*instance-name* Start the Agent after the shared disk and the logical IP address become available.
Stop	Execute the following commands in the following order to stop the Agent for SAN Switch: `/opt/jp1pc/tools/jpcstop agtw lhost=`*logical-host-name* `inst=`*instance-name* `/opt/jp1pc/tools/jpcstop act lhost=`*logical-host-name* Stop the Agent before the shared disk and the logical IP address are made unavailable. If services are stopped because of a failure, the return value of the `jpcstop` command is 3. Consider such a case as a normal end because the services are inactive. If the cluster software uses the return value to determine the execution result, make the return value 0.

Monitoring	Use the `ps` command to check that the processes below are running:
	`ps -ef | grep "`*process-name logical-host-name*`" | grep -v "grep` *process-to-be-monitored*`"`
	The following processes are to be monitored:
	`jpcagtw`, `agtw`/`jpcsto`, and `jpcah`
	For details about process names, see the *HiCommand Tuning Manager Agent Administration Guide*. In some situations, Agents need to be temporarily stopped. For such situations, provide a method for suppressing monitoring (such as not monitoring files while they are undergoing maintenance).

Item	Description
Forced stop	If forced stop is required, use the following command: `/opt/jp1pc/tools/jpcstop all lhost=`*logical-host-name* `kill=immediate` You can specify only `all` as a service key in the first argument. *Note*: By sending SIGKILL, this command performs a forced stop of all the processes of the Collection Manager and Agents running in the specified logical host environment. At this time, the Collection Manager and Agents are stopped not on the service level but on the logical host level. Forced stop must be set up only for the cases in which execution of an ordinary stop cannot stop the system.

Notes:

- The cluster software controls the starting and stopping of the Agent to be registered. Do not set up the Agent to start automatically when the OS starts.
- If the cluster software uses the return value of the `jpcstart` command or the `jpcstop` command to evaluate the execution result, specify the settings so that the return value of these commands is converted to the value expected by the cluster software. For details on the return values of the `jpcstart` command and the `jpcstop` command, see the *HiCommand Tuning Manager Command Line Interface Guide*.
- The length of characters to be displayed by the `ps` command varies with the OS. The length must be 47 or fewer characters when a logical host name and an instance name are added together. When you use the `ps` command for monitoring, make sure all the logical hosts are displayed by the `ps` command beforehand. If not all the characters are displayed, specify settings so that only the displayed characters are monitored.

7.3.4.4 Checking Starting and Stopping

To check normal operation, use the cluster software to start and stop Agent for SAN Switch at each node.

7.3.5 Canceling Setup in a Cluster System

This section describes how to cancel setup of Agent for SAN Switch in a cluster system. Procedures for canceling setup differ for an executing node and standby node. Cancel the setup of Agent for SAN Switch first for the executing node and then for the standby node.

Note: Before canceling setup, stop all the services of Collection Manager and the Agents that are running on the executing and standby nodes whose setup is to be canceled.

7.3.5.1 Canceling Setup of the Executing Node's Logical Host Environment

In the executing node, cancel setup of the logical host environment of Agent for SAN Switch. The procedure is as follows:

1. Mount the shared disk.

Make sure that the shared disk is mounted. If it is not, use cluster software or a volume manager to mount it.

Note specific to UNIX hosts: If there is a `jp1pc` directory in the specified environment directory, and there are files under the `jp1pc` directory despite the shared disk being unmounted, setup was performed while the shared disk was not mounted. In such a case, carry out the following procedure to resolve the problem:

a) Use the `tar` command to archive the `jp1pc` directory in the environment directory of the logical host for which you want to cancel setup on the local disk.

b) Mount the shared disk.

c) If the environment directory of the logical host for which you want to cancel setup does not exist on the shared disk, create the environment directory.

d) Expand the `tar` file in the environment directory of the logical host on the shared disk for which you want to cancel setup.

e) Unmount the shared disk.

f) Delete the `jp1pc` directory and its subordinates that are in the environment directory on the logical host whose setup you want to cancel, on the local disk.

2. Cancel setup of a port number.

   This procedure is required only when a port number was specified by the `jpcnsconfig port` command during setup in an environment with a firewall.

   To cancel setup of a port number, set "`0`" as the port number. For details about setting port numbers, see section 6.4.

3. Cancel setup of Agent for SAN Switch in a logical host environment.

   Execute the `jpchasetup delete` command to delete the logical host environment, as shown in the following example. In this example, the logical host name of Agent for SAN Switch is specified as `tm1-ha1` and the instance name as `FAB01`.

   Note: If you delete a logical host environment while the shared disk is not mounted, only the setting of the logical host on the physical host will be deleted and the directories and files on the shared disk will not be deleted. In such a case, you must mount the shared disk and manually delete the `jp1pc` directory under the environment directory.

   To delete the logical host environment:

   a) Execute the `jpchasetup list` command to check the settings of the logical host environment to be deleted, such as the logical host name and the path to the shared disk, as shown in the following example:

      ```
      jpchasetup list all -lhost tm1-ha1
      ```

   b) Execute the `jpcinsunsetup` command to delete the instance environment of Agent for SAN Switch, as shown in the following example:

      ```
      jpcinsunsetup agtw -lhost tm1-ha1 -inst FAB01
      ```

      When you execute the `jpcinsunsetup` command, the setting to start up the instances on the logical host will be deleted. At the same time, the files for the instances will be deleted from the shared disk.

c) Execute the `jpchasetup delete` command to delete the logical host environment of Agent for SAN Switch, as shown in the following example:

```
jpchasetup delete agtw -lhost tm1-ha1
```

When you execute the `jpchasetup delete` command, the setting to start up Agent for SAN Switch on the logical host will be deleted. At the same time, the file for the logical host will be deleted from the shared disk.

d) Execute the `jpchasetup list` command to check that Agent for SAN Switch has been deleted from the logical host environment, as shown in the following example:

```
jpchasetup list all
```

4. Cancel setup of the logical host environments for Collection Manager and other Agents.

   If you cancel setup of Collection Manager and any Agents other than Agent for SAN Switch from the same logical host, cancel setup of the logical host environments for them now.

   For details about the procedure for canceling setup of Collection Manager, see section 8.1.3. For details about the procedure for canceling setup of each Agent, see the section in this chapter that describes the procedure for your Agent.

5. Export the definitions of the logical host environment.

   After deleting the logical host environment for Agent for SAN Switch, export the environment definitions to a file.

   To export the definitions of the logical host environment, use the `jpchasetup export` command. This command will output the definitions of the logical host environments for Collection Manager and the Agents to an export file. The export file may have any name. For example, to export the definitions of the logical host environment to the `lhostexp.txt` file, execute the following command:

   ```
   jpchasetup export -f lhostexp.txt
   ```

   Collection Manager and the Agents make the environment of the executing node match that of the standby node by exporting and importing the environment definitions.

   If you import to the standby node the environment definitions exported at the executing node (where environment definitions of Collection Manager and the Agents were deleted), they will be compared with the existing environment definitions of the standby node (where the definitions of Collection Manager and the Agents remain without being deleted). Then, differences (that is, the environment definitions of Collection Manager and the Agents that were deleted at the executing node) will be deleted from the standby node.

6. Copy the exported file to the standby node.

   Copy the logical host environment definition file that you exported at step 5 from the executing node to the standby node.

7. Unmount a shared disk.

   End operations by unmounting the shared disk on the Windows host, or the file system on the UNIX host. To unmount the shared disk on the Windows host, use cluster software or a volume manager. To continue to use the shared disk, you do not have to unmount the shared disk or file system.

7.3.5.2 Canceling Setup of the Standby Node's Logical Host Environment

Cancel setup of the logical host environment for Agent for SAN Switch at the standby node. To cancel setup, copy the definitions of the logical host environment exported at the executing node to the standby node.

You do not have to unmount the shared disk to cancel setup at the standby node.

To cancel setup of the logical host environment at the standby node:

1. Execute the `jpchasetup import` command to import the definitions of the logical host environment, as shown in the following example:

   ```
   jpchasetup import -f lhostexp.txt
   ```

   This command will change the environment settings for the standby node to those in the export file. This means the setting to start Agent for SAN Switch of the logical host will be deleted. If setup is canceled for the Collection Manager and Agents on other logical hosts, those settings will also be deleted.

   The setup for the fixed port number specified by the `jpcnsconfig port` command during setup will also be canceled.

2. Execute the `jpchasetup list` command to check that the setting of the logical host environment is the same as that for the executing node, as shown in the following example:

   ```
   jpchasetup list all
   ```

7.3.5.3 Unregistering the Cluster Software

Delete, from the cluster software, the settings related to Agent for SAN Switch on a logical host. For details on the deletion procedure, see the documentation for the cluster software.

7.3.5.4 Deleting Settings at Tuning Manager

Delete the definitions related to Agent for SAN Switch whose setup is to be canceled.

To delete the definitions:

1. Delete the Tuning Manager's Agent information.

   For example, if Tuning Manager is running on the logical host `tm1-ha2`, and Agent for SAN Switch is running on the logical host `tm1-ha1`, execute the following command in Tuning Manager:

   `jpcctrl delete` ***service-ID*** `host=tm1-ha1 lhost=tm1-ha2`

   In *service-ID*, specify the service ID of the Agent to be deleted.

2. Restart the Collection Manager services.
3. Restart Performance Reporter.

7.4 Setting up Agent for NAS

This section explains the setup that is required before you can use Agent for NAS. If you are using Agent for NAS on a UNIX host, please review the following before you start setting up Agent for NAS.

Notes when the file size of the Store database is less than 2GB (for UNIX hosts only):
When the number of records to be stored for each record of the PD record type used by Agent for NAS is set to the default value, 2 GB of space is required for the Store database files. In a UNIX environment, the maximum usable file size might be smaller than 2 GB. Before using the Agent for NAS service, use the `ulimit` command to check the maximum usable file size. If the specified size is smaller than 2 GB, use the `ulimit` command to specify a larger value. For details about the default value for the number of records to be stored for each PD record type, see Appendix A.7.5.3.

7.4.1 Setting up an Instance Environment

You must specify instance information for the NAS system that Agent for NAS will monitor. Table 7.17 lists the instance information items that are to be specified. Check this information before you start the setup procedure.

Table 7.17 Instance Information for Agent for NAS

Item		Description
`destination_address`	When VLAN is used:	Specifies the real IP address of the management port of the NAS system. This setting is required.
	When VLAN is not used:	Specifies the fixed IP address of the NIC in the NAS system. This setting is required. See *Note*
`portnumber`		Specifies the port number used for collecting information from the NAS system. You must specify the default value (`20265`). This setting is required.
`detour_address`	When VLAN is used:	Specifies, as a backup route, the real IP address of another management port that has been established for the NAS system. You can omit this if you do not need to have a backup route.
	When VLAN is not used:	Specifies, as a backup route, the fixed IP address of another NIC that has been established for the NAS system. You can omit this if you do not need to have a backup route. See *Note*
`detour_portnumber`		Specifies, as a backup route, the port number that is used for collecting information from the NAS system. You

		must specify the value `20265` when setting up a backup route. You can omit this if you do not need to have a backup route.

Note: This is the fixed IP address that is assigned to each NIC in the NAS system, or the NAS system's fixed IP address that a NAS system administrator changed. This is not a service IP address. Enter this address in decimal dot notation.

Use the `jpcinssetup` command to construct an instance environment.

To construct an instance environment:

1. Execute the `jpcinssetup` command with the service key and instance name (no more than 32 bytes) specified.

   For example, to construct an instance environment for the instance named NS21 for Agent for NAS, execute the following command:

   ```
   jpcinssetup agtn -inst NS21
   ```

   Note: Use an instance name that is unique among all the names of the Agent instances on the network.

2. Set up the instance information for the NAS system you will monitor.

   Enter the information shown in Table 7.17, in accordance with the command's instructions. To use the displayed default value, press the **Enter** key.

3. To perform the operation with multiple instances, repeat steps 1 and 2 for each instance.

7.4.1.1 About the Constructed Instance Environment

Once you have entered all items, the instance environment is constructed. Described below are the organization of directories for instance environments and the service ID for an instance environment.

Organization of Directories for Instance Environments

Instance environments are constructed under the following directory:

- Windows: *installation-folder*`\agtn`
- UNIX: `/opt/jp1pc/agtn`

Table 7.18 shows the organization of the directories for instance environments.

Table 7.18 Organization of Directories for Instance Environments (Agent for NAS)

Directory and File Names			Description
agent	*instance-name*	jpcagt.ini	Startup-information file of the Agent Collector service
		jpcagt.ini.model See *Note*	Model file for the startup-information file of the Agent Collector service
		log	Directory for storing internal log files of the Agent Collector service
store	*instance-name*	*.DAT	Data model definition file
		backup	Default directory for backing up the database
		dump	Default directory for exporting the database
		jpcsto.ini	Startup-information file of the Agent Store service
		jpcsto.ini.model See *Note*	Model file for the startup-information file of the Agent Store service
		log	Directory for storing internal log files of the Agent Store service

Note: Use this file to restore the settings that were in effect before the instance environment was constructed.

Service ID for an Instance Environment

The following is the service ID for an instance environment:

product-ID function-ID instance-number instance-name [*host-name*]

The *instance-name* is specified with the `jpcinssetup` command. For details about service IDs, see the *HiCommand Tuning Manager Agent Administration Guide*.

Windows Service Name for an Instance Environment

The following are Windows service names for an instance environment:

- Agent Collector: `PFM - Agent for NAS` *instance-name*
- Agent Store: `PFM - Agent Store for NAS` *instance-name*

The *instance-name* is specified with the `jpcinssetup` command. For details about the Windows service name, see the *HiCommand Tuning Manager Agent Administration Guide*.

7.4.2 Canceling Setup of an Instance Environment

This section describes canceling setup of an instance environment. To cancel setup of multiple instance environments, you must repeat the following procedures for each environment:

- Delete the Agent's instance environment on the Agent host
- Delete the Agent's instance information on the Tuning Manager host

To delete the Agent's instance environment on the Agent host:

1. Find the instance name of Agent for NAS using the `jpcinslist` command. The command format is as follows:

   `jpcinslist agtn`

   For example, if the instance name is NS21, the command displays `NS21`.

2. Stop the Agent for NAS service in the instance environment if it is active.
3. Delete the instance environment using the `jpcinsunsetup` command. The command format is as follows:

   `jpcinsunsetup agtn -inst` *instance-name*

   Example:

   To delete an instance environment whose instance name is NS21:

   `jpcinsunsetup agtn -inst NS21`

   If the command is successful, the Windows services and the directories created during instance environment setup are deleted. If a service with the specified instance name is active, a message appears asking whether the service is to be stopped.

To delete the Agent's instance information on the Tuning Manager host:

1. On the Tuning Manager host, execute the `jpcctrl delete` command to delete the Agent's instance information.

   For example, to delete the instance information when the instance name is NS21, the host name is host03, the Agent Collector service ID is NA1NS21[host03], and the Agent Store service ID is NS1NS21[host03]:

   - Windows: `jpcctrl delete N?1NS21[host03] host=host03`
   - UNIX: `jpcctrl delete "N?1NS21[host03]" host=host03`

2. Restart the Collection Manager service.
3. Restart Performance Reporter.

7.4.3 Updating an Instance Environment

Updating an instance environment involves checking the instance name (using the `jpcinslist` command), then updating the instance environment (using the `jpcinssetup` command).

To update multiple instance environments, repeat the following procedure for each instance environment.

To update an instance environment:

1. Find the instance name by executing the `jpcinslist` command, specifying the service key of the Agent for NAS running in the instance environment.

   For example, to check the instance name of Agent for NAS, execute the following command:

   ```
   jpcinslist agtn
   ```

   If the specified instance name is NS21, the command displays `NS21`.

2. Check the information of the instance environment to be updated (see Table 7.19 at the end of these instructions).

3. If the Agent for NAS service is active in the instance environment that is to be updated, stop the service.

4. Execute the `jpcinssetup` command, specifying the service key and instance name of the Agent for NAS in the instance environment that you wish to update.

   For example, if you are updating the instance environment for the Agent for NAS with instance name NS21, execute the following command:

   ```
   jpcinssetup agtn -inst NS21
   ```

5. If the service is still active in the instance environment that is to be updated when you execute the `jpcinssetup` command, a confirmation message is displayed to enable you to stop the service.

   If you stop the service, update processing resumes; if you do not stop the service, update processing is cancelled.

6. Enter the information shown in Table 7.19 in accordance with the command's instructions to update the instance information.

   The current settings are displayed. To use the displayed value, press the **Enter** key. When all entries are completed, the instance environment is updated.

7. Restart the service in the updated instance environment.

Table 7.19 Whether the Instance Information for Agent for NAS Can be Updated

Item		Description
destination_address	When VLAN is used:	This is modifiable (i.e., can be updated). This item specifies the real IP address of the management port of the NAS system. This setting is required.
	When VLAN is not used:	This is modifiable (i.e., can be updated). This item specifies the fixed IP address of a NIC in the NAS system. This setting is required. See *Note*
portnumber		This is modifiable (i.e., can be updated). This item specifies the port number used to collect information from the NAS system. You must specify the default value (20265). This setting is required.
detour_address	When VLAN is used:	This is modifiable (i.e., can be updated). This item specifies, as a backup route, the real IP address of another management port that has been established for the NAS system. Specify a space if you wish to keep this item unset.
	When VLAN is not used:	This is modifiable (i.e., can be updated). This item specifies, as a backup route, a fixed IP address of another NIC that has been established for the NAS system. Specify a space if you want to keep this item unset. See *Note*
detour_portnumber		This is modifiable (i.e., can be updated). This item specifies, as a backup route, the port number that is used for collecting information from the NAS system. You must specify 20265 if you wish to set up a backup route. Specify a space if you wish to keep this item unset.

Note: This is the fixed IP address that is assigned to each NIC in the NAS system, or a NAS system's fixed IP address that the NAS system administrator changed. This is not a service IP address. Enter this address in decimal dot notation.

7.4.4 Setting up Agent for NAS in a Cluster System

This section describes setup for using Agent for NAS in a cluster system. Setup procedures differ for an executing node and standby node. Perform setup for the executing node first, and then for the standby node.

Note: If you set up an Agent in a logical host environment, the settings of the Agent in the physical host environment will not be inherited. For both logical and physical host environments, the instance environment is newly created when the instance environment is set.

7.4.4.1 Setting up the Executing Node's Logical Host Environment

Set up a logical host environment for Agent for NAS in the executing node. The procedure is as follows:

Note: Before performing setup, terminate all the services of Collection Manager and the Agent in the entire Tuning Manager system.

1. Mount the shared disk.

   Make sure that the shared disk is mounted. If it is not, use cluster software or a volume manager to mount it.

2. Set up a logical host environment for Agent for NAS.

   Execute the `jpchasetup create` command to create a logical host environment.

   This command copies required data to the shared disk, sets definitions for a logical host, and creates a logical host environment.

   To create a logical host environment:

   a) Execute the `jpchasetup create` command to create a logical host environment for Agent for NAS, as shown in the following example:

      For Windows: `jpchasetup create agtn -lhost tm1-ha1 -d S:\tm1`

      For UNIX: `jpchasetup create agtn -lhost tm1-ha1 -d /tm1`

      Use the `-lhost` option to specify the logical host name. In this example, `tm1-ha1` is specified as the logical host name. If DNS is used, specify the logical host name without the domain name.

      Specify the directory name of the shared disk as the environment directory name in the `-d` option. For example, if you specify `-d S:\tm1` on a Windows host, then `S:\tm1\jp1pc` will be created and a file for the logical host environment will be created. If you specify `-d /tm1` in a UNIX host, then `/tm1/jp1pc` will be created and a file for a logical host environment will be created.

   b) Execute the `jpchasetup list` command to check that the setting of the created logical host environment is correct, as shown in the following example:

      ```
      jpchasetup list all
      ```

3. Set the connection-target Tuning Manager.

   Execute the `jpcnshostname` command to specify the Tuning Manager that will manage Agent for NAS, as shown in the following example:

   ```
   jpcnshostname -s tm1 -lhost tm1-ha1
   ```

   Use the `-s` option to specify the host name of connection-target Tuning Manager. When the connection-target Tuning Manager is running on a logical host, specify the logical host name of the connection-target Tuning Manager by using the `-s` option. In this example, the host name of Tuning Manager is specified as `tm1`.

   Also, use the `-lhost` option to specify the logical host name of Agent for NAS. In this example, the logical host name of Agent for NAS is specified as `tm1-ha1`.

4. Set up an instance environment.

a) Execute the `jpcinssetup` command to set up an instance environment for Agent for NAS, as shown in the following example:

```
jpcinssetup agtn -lhost tm1-ha1 -inst NS21
```

Use the `-lhost` option to specify the logical host name. In this example, the logical host name of Agent for NAS is specified as `tm1-ha1`, and the instance name is `NS21`.

b) Set up an instance environment.

An instance environment is set up in the same way as for a non-cluster system. For details on what is to be set up, see section 7.4.1.

5. Set up logical host environments for Collection Manager and other Agents.

If you set up Collection Manager and any Agents other than Agent for NAS on the same logical host, set up logical host environments for them now.

For details about the setup procedure for Collection Manager, see section 3.3.1. For details about the setup procedure for each Agent, see the section in this chapter that describes the setup procedure for your Agent.

6. Set a port number.

You need to perform this setup only when Tuning Manager series programs are used in a network environment with a firewall. If communications among the Tuning Manager series programs are via a firewall, specify a port number by using the `jpcnsconfig port` command.

For details about setting port numbers, see section 6.4. For details about the list of the port numbers, see the *HiCommand Tuning Manager Agent Administration Guide*.

7. Set an IP address.

You can specify an IP address when using Tuning Manager series programs in a network environment with more than one LAN connected. To specify an IP address, edit the `jpchosts` file directly.

For details on setting an IP address, see section 6.5.

Note: After editing the `jpchosts` file, copy it from the executing node to the standby node.

8. Export the definitions of the logical host environment.

After creating a logical host environment for Agent for NAS, export the environment definitions to a file. All the definitions of the Collection Manager and Agents that are set up on the logical host will be output to the file. If you set up Collection Manager and any Agents other than Agent for NAS on the same logical host, export the definitions after you finish the setup.

To export the definitions of the logical host environment, execute the `jpchasetup export` command. This command will output, to an export file, the definitions of the logical host environment that has been created. The export file may have any name. For example, to export the definitions of the logical host environment to the `lhostexp.txt` file, execute the following command:

```
jpchasetup export -f lhostexp.txt
```

9. Copy the exported file to the standby node.

Copy the file that you exported at step 8 from the executing node to the standby node.

10. Unmount the shared disk.

    End operations by unmounting the shared disk on the Windows host, or the file system on the UNIX host. To unmount the shared disk on the Windows host, use cluster software or a volume manager. To continue to use the shared disk, you do not have to unmount the shared disk or file system.

    Note specific to UNIX hosts: If there is a `jp1pc` directory in the specified environment directory, and there are files under the `jp1pc` directory despite the shared disk being unmounted, setup was performed while the shared disk was not mounted. In such a case, perform the following procedure to resolve the problem:

    a) Use the `tar` command to archive the `jp1pc` directory in the specified environment directory on the local disk.

    b) Mount the shared disk.

    c) If the specified environment directory does not exist on the shared disk, create the environment directory.

    d) From the `tar` file created at (a), extract the archived directory into the environment directory on the shared disk.

    e) Unmount the shared disk.

    f) Delete the `jp1pc` directory and its subordinates from the specified directory on the local disk.

7.4.4.2 Setting up the Standby Node's Logical Host Environment

Set up a logical host environment for Agent for NAS in the standby node. To set up the logical host environment, import, to the standby node, the definitions of the logical host environment that were exported at the executing node.

To import the definitions of the logical host environment for Agent for NAS, use the `jpchasetup import` command. If more than one Collection Manager or Agent has been set up on a single logical host, all the definitions are imported at the same time.

You do not have to mount the shared disk to execute this command.

To set up the logical host environment for the standby node:

1. Execute the `jpchasetup import` command to import the definitions of the logical host environment, as shown in the following example:

   ```
   jpchasetup import -f lhostexp.txt
   ```

   This command will change the environment settings for the standby node to those in the export file. This will set up the environment for starting the Collection Manager and Agents on the logical host.

   The fixed port number specified by the `jpcnsconfig port` command during setup for the executing node will also be imported.

2. Execute the `jpchasetup list` command to check that the setting of the logical host environment is the same as that for the executing node, as shown in the following example:

   ```
   jpchasetup list all
   ```

Note: After editing the `jpchosts` file, copy it from the executing node to the standby node.

7.4.4.3 Registering Agent for NAS in the Cluster Software

To use an Agent in a logical host environment, register it in the cluster software. This registration sets up the environment so that the Agent can be started or terminated via control from the cluster software.

This section describes how to register Agent for NAS in the cluster software separately for each OS.

For Windows

The example below describes the settings specified when registering Agent for NAS in the cluster software on a Windows host. The example uses Windows 2000 MSCS as the cluster software. For Agent for NAS, you need to register the following services in the cluster software.

Table 7.20 Agent for NAS Services to Be Registered in Cluster Software

Displayed Name	Service Name	Dependency
PFM - Agent Store for NAS *instance-name* [*lhost*]	JP1PCAGT_NS_*instance-name* [*lhost*]	IP address resource Physical disk resource
PFM - Agent for NAS *instance-name* [*lhost*]	JP1PCAGT_NA_*instance-name* [*lhost*]	Cluster resource for PFM – Agent Store for NAS *instance-name* [*lhost*]
PFM - Action Handler [*lhost*]	JP1PCMGR_PH [*lhost*]	IP address resource Physical disk resource

Note: Replace *lhost* by a logical host name. For example, if the instance name is `NS21` and the logical host name is `tm1-ha1`, the displayed name of the service will be `PFM - Agent Store for NAS NS21 [tm1-ha1]`, and the service name will be `JP1PCAGT_NS_NS21 [tm1-ha1]`.

The above services are registered as resources of MSCS. Set the resources as described below. The bold text below indicates items to be set for MSCS.

- Set **Type of resource** to **Generic service**.
- Set **Name**, **Service name** and **Dependency** as shown in Table 7.20.

  Note that a name in the *Displayed name* column is the name of a service, and a name in the *Service name* column is used to specify a service to be controlled from MSCS.

- Do not set **Startup parameter** and **Registry replication**.
- Set the **Details** page of the properties according to whether you want the system to fail over when a failure occurs with the Agent.

  Normally you specify settings so that no failover occurs. If you want the system to fail over, set this page as follows:

  - **Restart**: Select this item.
  - **Apply to a group**: Do not select this item.
  - **Threshold** for the number of restart retries: `3` (the recommended value)

Note: The cluster software controls the starting and stopping of the services to be registered. Thus, set **Type of startup** to **Manual** so that the services will not start automatically when the OS starts up. The type of startup for a service is set to **Manual** immediately after the service is set up by the `jpchasetup create` command.

For UNIX

The example below describes the settings specified when registering Agent for NAS in the cluster software on a UNIX host. There are four items required for registering an application in the UNIX cluster software: Startup, Stop, Monitoring and Forced stop.

Table 7.21 Control Method for Agent for NAS Registered in Cluster Software

Item	Description
Startup	Execute the following commands in the following order to start the Agent for NAS: `/opt/jp1pc/tools/jpcstart act lhost=`*logical-host-name* `/opt/jp1pc/tools/jpcstart agtn lhost=`*logical-host-name* `inst=`*instance-name* Start the Agent after the shared disk and the logical IP address become available.
Stop	Execute the following commands in the following order to stop the Agent for NAS: `/opt/jp1pc/tools/jpcstop agtn lhost=`*logical-host-name* `inst=`*instance-name* `/opt/jp1pc/tools/jpcstop act lhost=`*logical-host-name* Stop the Agent before the shared disk and the logical IP address are made unavailable. If services are stopped because of a failure, the return value of the `jpcstop` command is 3. Consider such a case as a normal end because the services are inactive. If the cluster software uses the return value to determine the execution result, make the return value 0.

Monitoring	Use the `ps` command to check that the processes below are running:
	`ps -ef | grep "`*process-name logical-host-name*`" | grep -v "grep `*process-to-be-monitored*`"`
	The following processes are to be monitored:
	`jpcagtn`, `agtn`/`jpcsto`, and `jpcah`
	For details about process names, see the *HiCommand Tuning Manager Agent Administration Guide*. In some situations, Agents need to be temporarily stopped. For such situations, provide a method for suppressing monitoring (such as not monitoring files while they are undergoing maintenance).

Item	Description
Forced stop	If forced stop is required, use the following command: `/opt/jp1pc/tools/jpcstop all lhost=`*logical-host-name* `kill=immediate` You can specify only `all` as a service key in the first argument. *Note*: By sending SIGKILL, this command performs a forced stop of all the processes of the Collection Manager and Agents running in the specified logical host environment. At this time, the Collection Manager and Agents are stopped not on the service level but on the logical host level. Forced stop must be set up only for the cases in which execution of an ordinary stop cannot stop the system.

Notes:

- The cluster software controls the starting and stopping of the Agent to be registered. Do not set up the Agent to start automatically when the OS starts.
- If the cluster software uses the return value of the `jpcstart` command or the `jpcstop` command to evaluate the execution result, specify the settings so that the return value of these commands is converted to the value expected by the cluster software. For details on the return values of the `jpcstart` command and the `jpcstop` command, see the *HiCommand Tuning Manager Command Line Interface Guide*.
- The length of characters to be displayed by the `ps` command varies with the OS. The length must be 47 or fewer characters when a logical host name and an instance name are added together. When you use the `ps` command for monitoring, make sure all the logical hosts are displayed by the `ps` command beforehand. If not all the characters are displayed, specify settings so that only the displayed characters are monitored.

7.4.4.4 Checking Starting and Stopping

To check normal operation, use the cluster software to start and stop Agent for NAS at each node.

7.4.5 Canceling Setup in a Cluster System

This section describes how to cancel setup of Agent for NAS in a cluster system. Procedures for canceling setup differ for an executing node and standby node. Cancel the setup of Agent for NAS first for the executing node and then for the standby node.

Note: Before canceling setup, stop all the services of Collection Manager and the Agents that are running on the executing and standby nodes whose setup is to be canceled.

7.4.5.1 Canceling Setup of the Executing Node's Logical Host Environment

In the executing node, cancel setup of the logical host environment of Agent for NAS. The procedure is as follows:

1. Mount the shared disk.

Make sure that the shared disk is mounted. If it is not, use cluster software or a volume manager to mount it.

Note specific to UNIX hosts: If there is a `jp1pc` directory in the specified environment directory, and there are files under the `jp1pc` directory despite the shared disk being unmounted, setup was performed while the shared disk was not mounted. In such a case, carry out the following procedure to resolve the problem:

a) Use the `tar` command to archive the `jp1pc` directory in the environment directory of the logical host for which you want to cancel setup on the local disk.

b) Mount the shared disk.

c) If the environment directory of the logical host for which you want to cancel setup does not exist on the shared disk, create the environment directory.

d) Expand the `tar` file in the environment directory of the logical host on the shared disk for which you want to cancel setup.

e) Unmount the shared disk.

f) Delete the `jp1pc` directory and its subordinates that are in the environment directory on the logical host whose setup you want to cancel, on the local disk.

2. Cancel setup of a port number.

   This procedure is required only when a port number was specified by the `jpcnsconfig port` command during setup in an environment with a firewall.

   To cancel setup of a port number, set "`0`" as the port number. For details about setting port numbers, see section 6.4.

3. Cancel setup of Agent for NAS in a logical host environment.

   Execute the `jpchasetup delete` command to delete the logical host environment, as shown in the following example. In this example, the logical host name of Agent for NAS is specified as `tm1-ha1` and the instance name as `NS21`.

   Note: If you delete a logical host environment while the shared disk is not mounted, only the setting of the logical host on the physical host will be deleted and the directories and files on the shared disk will not be deleted. In such a case, you must mount the shared disk and manually delete the `jp1pc` directory under the environment directory.

   To delete the logical host environment:

   a) Execute the `jpchasetup list` command to check the settings of the logical host environment to be deleted, such as the logical host name and the path to the shared disk, as shown in the following example:

      ```
      jpchasetup list all -lhost tm1-ha1
      ```

b) Execute the `jpcinsunsetup` command to delete the instance environment of Agent for NAS, as shown in the following example:

```
jpcinsunsetup agtn -lhost tm1-ha1 -inst NS21
```

When you execute the `jpcinsunsetup` command, the setting to start up the instances on the logical host will be deleted. At the same time, the files for the instances will be deleted from the shared disk.

c) Execute the `jpchasetup delete` command to delete the logical host environment of Agent for NAS, as shown in the following example:

```
jpchasetup delete agtn -lhost tm1-ha1
```

When you execute the `jpchasetup delete` command, the setting to start up Agent for NAS on the logical host will be deleted. At the same time, the file for the logical host will be deleted from the shared disk.

d) Execute the `jpchasetup list` command to check that Agent for NAS has been deleted from the logical host environment, as shown in the following example:

```
jpchasetup list all
```

4. Cancel setup of the logical host environments for Collection Manager and other Agents.

   If you cancel setup of Collection Manager and any Agents other than Agent for NAS from the same logical host, cancel setup of the logical host environments for them now.

   For details about the procedure for canceling setup of Collection Manager, see section 8.1.3. For details about the procedure for canceling setup of each Agent, see the section in this chapter that describes the procedure for your Agent.

5. Export the definitions of the logical host environment.

   After deleting the logical host environment for Agent for NAS, export the environment definitions to a file.

   To export the definitions of the logical host environment, use the `jpchasetup export` command. This command will output the definitions of the logical host environments for Collection Manager and the Agents to an export file. The export file may have any name. For example, to export the definitions of the logical host environment to the `lhostexp.txt` file, execute the following command:

   ```
   jpchasetup export -f lhostexp.txt
   ```

   Collection Manager and the Agents make the environment of the executing node match that of the standby node by exporting and importing the environment definitions.

   If you import to the standby node the environment definitions exported at the executing node (where environment definitions of Collection Manager and the Agents were deleted), they will be compared with the existing environment definitions of the standby node (where the definitions of Collection Manager and the Agents remain). Then, differences (that is, the environment definitions of Collection Manager and the Agents that were deleted at the executing node) will be deleted from the standby node.

6. Copy the exported file to the standby node.

   Copy the logical host environment definition file that you exported at step 5 from the executing node to the standby node.

7. Unmount a shared disk.

   End operations by unmounting the shared disk on the Windows host, or the file system on the UNIX host. To unmount the shared disk on the Windows host, use cluster software or a volume manager. To continue to use the shared disk, you do not have to unmount the shared disk or file system.

7.4.5.2 Canceling Setup of the Standby Node's Logical Host Environment

Cancel setup of the logical host environment for Agent for NAS at the standby node. To cancel setup, copy the definitions of the logical host environment exported at the executing node to the standby node.

You do not have to unmount the shared disk to cancel setup at the standby node.

To cancel setup of the logical host environment at the standby node:

1. Execute the `jpchasetup import` command to import the definitions of the logical host environment, as shown in the following example:

   ```
   jpchasetup import -f lhostexp.txt
   ```

   This command will change the environment settings for the standby node to those in the export file. This means the setting to start Agent for NAS of the logical host will be deleted. If setup is canceled for the Collection Manager and Agents on other logical hosts, those settings will also be deleted.

   The setup for the fixed port number specified by the `jpcnsconfig port` command during setup will also be canceled.

2. Execute the `jpchasetup list` command to check that the setting of the logical host environment is the same as that for the executing node, as shown in the following example:

   ```
   jpchasetup list all
   ```

7.4.5.3 Unregistering the Cluster Software

Delete, from the cluster software, the settings related to Agent for NAS on a logical host. For details on the deletion procedure, see the documentation for the cluster software.

7.4.5.4 Deleting Settings at Tuning Manager

Delete the definitions related to Agent for NAS whose setup is to be canceled.

To delete the definitions:

1. Delete the Tuning Manager's Agent information.

   For example, if Tuning Manager is running on the logical host `tm1-ha2`, and Agent for NAS is running on the logical host `tm1-ha1`, execute the following command in Tuning Manager:

   `jpcctrl delete` ***service-ID*** `host=tm1-ha1 lhost=tm1-ha2`

   In *service-ID*, specify the service ID of the Agent to be deleted.

2. Restart the Collection Manager services.
3. Restart Performance Reporter.

7.5 Setting up Agent for Oracle

This section explains the setup that is required before you can use Agent for Oracle. To monitor an Oracle database, you need to create an Oracle account and an instance environment.

7.5.1 Creating an Oracle User Account Used by Agent for Oracle

To use Agent for Oracle for monitoring Oracle databases and collecting performance data, an Oracle user account (abbreviated hereafter as **user account**) with specific Oracle database privileges is required.

To set up a user account, use one of the following procedures:

- In Oracle8i:

  Use the `sys` account to set up the user account used for monitoring Oracle databases from Agent for Oracle.

- In Oracle9i or later:

  Follow either of the following to perform setup:

  - Use the `sys` account to set the user account used for monitoring Oracle databases from Agent for Oracle.
  - Create an Oracle user account with specific system privileges, and use the account to set the user account used for monitoring Oracle databases from Agent for Oracle. For details on Oracle user accounts with specific system privileges, see 7.5.1.1.

7.5.1.1 Privileges Needed to Create a User Account

Before Agent for Oracle operation is started, the user account needed to run Agent for Oracle needs to be created using the `sys` account or another user account with the following privileges:

- CREATE USER
- GRANT ANY PRIVILEGE

Note 1:

User accounts created with the above two privileges only need to be created when a user account used to monitor an Oracle database is created. They are not used during Agent for Oracle operation.

Note 2:

The user account creation script provided by Agent for Oracle (`mk_user.sql` for Oracle9i and 10g, and `mk_user8.sql` for Oracle8i) needs to be executed by a user account with both CREATE USER and GRANT ANY PRIVILEGE privileges.

The following describes the reasons why these privileges are required:

CREATE USER and GRANT ANY PRIVILEGE privileges are needed during account creation for the following reasons:

1. CREATE USER

   This privilege is needed to create user accounts used for monitoring an Oracle database from Agent for Oracle.

2. GRANT ANY PRIVILEGE

   This privilege is needed to grant the following privileges to user accounts used for monitoring a created Oracle database.

   - CREATE SESSION
   - CREATE TABLE
   - CREATE PROCEDURE
   - SELECT ANY DICTIONARY

     Note: The SELECT ANY DICTIONARY system privilege is needed when the monitoring target is Oracle9i or Oracle 10g.
   - SELECT ANY TABLE
   - INSERT ANY TABLE
   - UPDATE ANY TABLE
   - DELETE ANY TABLE
   - CREATE ANY INDEX
   - ALTER ANY INDEX
   - UNLIMITED TABLESPACE

7.5.1.2 Operations Performed for Oracle Databases and Required System Privileges

The following table describes the operations performed for Oracle databases to allow Agent for Oracle to collect performance data, and the system privileges for the user account used to monitor the Oracle database that are needed to perform these operations.

Table 7.22 Operations Performed on the Oracle Databases and Required System Privileges

Operations	Required System Privileges
▪ To search a static data dictionary view ▪ To search a dynamic performance view ▪ To execute a listener control utility ▪ To obtain an execution schedule for the selected SQL ▪ To execute an original stored package of Agent for Oracle	▪ CREATE SESSION ▪ CREATE TABLE ▪ CREATE PROCEDURE ▪ SELECT ANY DICTIONARY ▪ SELECT ANY TABLE ▪ INSERT ANY TABLE ▪ DELETE ANY TABLE ▪ UPDATE ANY TABLE ▪ CREATE ANY INDEX ▪ ALTER ANY INDEX ▪ UNLIMITED TABLESPACE

The user account that is used to monitor Oracle databases and has the system privileges described in Table 7.22 is created by executing the `mk_user.sql` script provided with Agent for Oracle. If necessary, create an Oracle user account. Note, however, that you can only use the `mk_user.sql` script when the version of Oracle Database to be monitored is Oracle9i Database Release1 or later. When the version of the Oracle database to be monitored is Oracle8i, use the `mk_user8.sql` script instead of the `mk_user.sql` script.

7.5.1.3 Information Needed to Create an Oracle User Account

The table below shows information required to create an Oracle user account. Before starting account setup, obtain the following information:

Table 7.23 Information Required for the Creation of an Oracle User Account

Item	Description
`Enter username`	Enter the name of the user account to be created. The value specified must be a string consisting of single-byte 7-bit ASCII alphanumeric characters, with a length of up to 30 bytes, and must also be specifiable for the `user` parameter in the CREATE USER statement. The default value is `PFMAGTO`. *Note*: If you specify an existing database account as the account for the Agent for Oracle instance, an error occurs during script processing. You must check the account names in the database, and specify the account dedicated to the Agent for Oracle instance.
`Enter password`	Enter a password for the user account to be created. The value specified must be a string consisting of single-byte 7-bit ASCII alphanumeric characters, with a length of up to 30 bytes, and must also be specifiable for the `BY password` parameter for the IDENTIFIED clause in the CREATE USER statement. This entry is mandatory.
`Enter default tablespace`	Enter a default tablespace to be used by the user account to be created. The value specified must be a string consisting of single-byte 7-bit ASCII alphanumeric characters, with a length of up to 30 bytes, and must also be specifiable for the DEFAULT TABLESPACE clause in the CREATE USER statement. This entry is mandatory. *Note*: Do not specify a SYSTEM or INDEX tablespace as the default tablespace. If you specify these tablespaces in Oracle8i, processing of `mk_user8.sql` finishes as stated in the Oracle8i specifications. However, if you register Agent for Oracle packages in the SYSTEM and INDEX tablespaces, important tablespaces in these tablespaces will be used. Specify a default tablespace in which Agent for Oracle packages can be registered without causing any problems. Alternatively, create a tablespace for Agent for Oracle and specify it as the default tablespace.
`Enter default temporary tablespace`	Enter a default temporary tablespace to be used by the user account to be created. The value specified must be a string consisting of single-byte 7-bit ASCII alphanumeric characters, with a length of up to 30 bytes, and must also be specifiable for the TEMPORARY TABLESPACE clause in the CREATE USER statement. This entry is mandatory. *Note*: Do not specify a SYSTEM, INDEX, or USERS tablespace as the default temporary tablespace. If you specify these tablespaces in Oracle8i, processing of `mk_user8.sql` finishes as stated in the Oracle8i specifications. However, if you register these tablespaces as the default temporary tablespace to be used by Agent for Oracle packages, important tablespaces in the SYSTEM and INDEX tablespaces will be used. Specify a tablespace that can be used as the default temporary tablespace without causing any problems. Alternatively, create a tablespace for Agent for Oracle and specify it as the default temporary

	tablespace.

Notes:

- Make sure that, when entering a value for each item, you use a string consisting of single-byte 7-bit ASCII alphanumeric characters, with a length of up to 30 bytes. If the entered value exceeds 30 bytes, or contains characters other than single-byte 7-bit ASCII alphanumeric characters, the script may perform unexpected operations.
- When entering a value for each item, use non-quote characters in accordance with the naming convention for schema objects. If you specify a quote character, the script may perform unexpected operations. For details about the naming convention for schema objects and non-quote characters, refer to your Oracle documentation.
- To check the details of the user account created by the `mk_user.sql` or `mk_user8.sql` script, see the `DBA_USERS` static data dictionary view for the Oracle database being monitored.

  The following example shows how to check the details on the `A4O` user account displayed in the `DBA_USERS` static data dictionary view. If you execute the following SQL statement and find, from the execution result, that the account was created incorrectly, delete the account and then re-create it by using the `mk_user.sql` or `mk_user8.sql` script.

  Example:

  To view the details of the `A4O` user account that is for monitoring the Oracle database:

  a) From the command prompt, connect to SQL*Plus with the `sys` account:

     ```
     >sqlplus
     Oracle-account@name-of-database-monitored/password-for-Oracle-account
     ```

  b) Execute the following SQL statement in SQL*Plus:

     ```
     SQL>select DEFAULT_TABLESPACE,TEMPORARY_TABLESPACE from DBA_USERS
     where USERNAME='A4O';
     ```

  c) Check the `DEFAULT_TABLESPACE` column (default tablespace) and the `TEMPORARY_TABLESPACE` column (default temporary tablespace) displayed in the execution result.

Before creating an Oracle user account, prepare all resources (such as a tablespace).

For details about the `CREATE USER` statement, refer to your Oracle documentation.

7.5.1.4 Creating an Oracle User Account

You can create an Oracle user account with the following procedures.

1. Configure an environment so that the Oracle `sqlplus` command can be executed.

   For details about Oracle environment configuration, refer to your Oracle documentation.

2. Move to the following directory that contains the `mk_user.sql` script provided by Agent for Oracle:
   - Windows: *installation-folder*`\agto\agent\sql`
   - UNIX: `/opt/jp1pc/agto/agent/sql`

3. Execute the `mk_user.sql` script for the Oracle database to be monitored. For example:

   `sqlplus` *Oracle-account@name-of-net-service-for-database-to-be-monitored/password-for-Oracle-account* `@mk_user.sql`

   Notes:
   - To create an Oracle user account when the version of the Oracle database to be monitored is Oracle8i, replace `mk_user.sql` with `mk_user8.sql` in the procedure for creating an account, and then perform that procedure.
   - If you execute the `mk_user.sql` or `mk_user8.sql` script without the `AS SYSDBA` or `AS SYSOPER` option specified, an error might occur. In such a case, re-execute the script with the `AS SYSDBA` or `AS SYSOPER` option specified.
   - If you execute the `mk_user.sql` or `mk_user8.sql` script when connected as SYSDBA or SYSOPER, you cannot specify the `AS SYSDBA` option and the `AS SYSOPER` option at the same time. Connect as SYSDBA or SYSOPER to the Oracle database to be monitored.

     The following example shows how to execute the `mk_user.sql` script:

     `sqlplus "`*Oracle-account@name-of-the-net-service-for-the-database-to-be-monitored/password-for-Oracle-account* `AS [SYSDBA | SYSOPER]" @mk_user.sql`
   - If the `mk_user.sql` or `mk_user8.sql` script is executed, the execution result is output to a spool file by the script processing. Note, however, that creation of a spool file fails in the following cases:
     - When executing the `mk_user.sql` or `mk_user8.sql` script, the current directory is not changed to the directory mentioned in step 2.
     - On a UNIX host, when you attempt to execute the `mk_user.sql` or `mk_user8.sql` script in SQL*PLUS as a user other than root.
   - `sqlplus` is a command provided by Oracle Corporation.

4. Specify the parameters required for creating an Oracle user account.

Enter the items listed in Table 7.23 in accordance with the command's instructions. No items can be omitted. If you want to use the displayed default value, simply press the return key.

After you enter all entries, an Oracle user account is created.

Notes:

- If you specify an account other than `sys` for Agent for Oracle, the value of the Explain Plan (`EXPLAIN_PLAN`) field in the SQL Text (`PD_PDSQ`) record cannot be obtained for an operation on an object in the `SYS` schema. In such a case, the Explain Plan (`EXPLAIN_PLAN`) field stores the message `Explain Plan Failed`. If you want to obtain, for a `SYS` schema object, the value of the Explain Plan (`EXPLAIN_PLAN`) field in the SQL Text (`PD_PDSQ`) record, specify `sys` as the account to be used by Agent for Oracle.
- If the account used by Agent for Oracle has no privileges to access an object that belongs to the schema for the user executing SQL, or the object cannot be viewed, the value of the Explain Plan (`EXPLAIN_PLAN`) field for the SQL Text (`PD_PDSQ`) record cannot be obtained. In this case, the `Explain Plan Failed` message is stored in the Explain Plan (`EXPLAIN_PLAN`) field. To obtain the value of the Explain Plan (`EXPLAIN_PLAN`) field, either add permissions to access the schema, or execute the SQL for this field using *owner-name.table-name*.
- Because the Oracle user account created by the `mk_user.sql` or `mk_user8.sql` script is granted permissions (such as the UPDATE ANY TABLE system privileges) to manipulate the objects in other schema, take extra care when managing accounts.
- The created user account is granted unlimited permissions to write over the tablespace specified as the default tablespace. To change the quota for the tablespace, in an environment where the Oracle `sqlplus` command can be executed, issue the `ALTER USER` statement after the user account is created. To issue the `ALTER USER` statement, the Oracle account must have the ALTER USER system privileges.

  The following shows an example of changing the quota:

  `ALTER USER` *Oracle-account* `QUOTA` *upper-limit-of-the-tablespace-quota* `ON` *tablespace-name*`;`

  For details about the `ALTER USER` statement, refer to the Oracle documentation.

7.5.2 Setting up an Instance Environment

Setting up an instance environment involves the following tasks. You can set up multiple instance environments by repeating the procedure for each instance.

- Constructing an instance environment
- Registering objects in the Oracle database
- Setting up the Oracle database

This section describes the procedure for each of the tasks.

7.5.2.1 Constructing an Instance Environment

You must specify instance information for the Oracle database that Agent for Oracle will monitor. Table 7.24 lists the instance information items that are to be specified. Check this information before you start the setup procedure. For details about Oracle instance information, refer to the Oracle documentation.

Table 7.24 Instance Information for Agent for Oracle

Item	Description
`oracle_sid`	Specify the Oracle system identifier to be monitored (same value as for the ORACLE_SID environment variable). The default is the value specified in the `-inst` option of the `jpcinssetup` command. The value must be a string of up to 255 single-byte characters, not including the space character, tab, and the following special characters: `, < >`
`oracle_home`	Specify the Oracle home directory (same value as for the ORACLE_HOME environment variable). The value must be a string of up to 255 single-byte characters, not including the space character, tab, and the following special characters: `, < >`
`oracle_version`	Specify the version number of Oracle Database. The default is `8`. ▪ For Oracle8 or Oracle8i: `8` ▪ For Oracle9i: `9` ▪ For Oracle 10g: `10`
`oracle_user`	Specify an account for monitoring Oracle that can reference and execute SYS schema objects. The default is `sys`. The value must be a string of up to 255 single-byte characters, not including the space character, tab, and the following special characters: `, < >`
`oracle_passwd`	Specify a password for the account that was specified in `oracle_user`. The value must be a string of up to 255 single-byte characters, not including the space character, tab, and the following special characters: `, < >`
`sqlnet`	For an Oracle RAC structure, specify `Y`. The default is `N`. For details on the RAC structure, refer to the Oracle documentation.

net_service_name	Specify the net service name of the database to be monitored. The default is the instance name (value of oracle sid). This value takes effect when Y is specified in sqlnet. For details about the net service name of the database to be monitored, refer to your Oracle documentation. The value must be a string of up to 255 single-byte characters, not including the space character, tab, and the following special characters: , < >
listener_home	Specify the ORACLE_HOME environment variable of the Oracle component that contains the listener that you want to monitor. The default is the value specified for oracle_home. The value must be a string of up to 255 single-byte characters, not including the space character, tab, and the following special characters: , < >
listener_name	Specify the name of one listener that is to be monitored. The default is LISTENER, which is the default listener name. You can specify up to 255 single-byte characters. The following characters, spaces, and tabs cannot be specified: , < >
retry_time	Note that this item only needs to be set up in the Windows environment. Specify the retry interval for reestablishing connection in the event of an authentication error while establishing a connection with the Oracle system. The default is 0 seconds. The value (in seconds) must be in between 0 and 600.
log_path (see *Note 1*)	Specify the full path of the output directory for agent logs. The default value is as follows: For Windows: *installation-folder*\agto\agent*instance-name*\log For UNIX: opt/jp1pc/agto/agent/*instance-name*/log You can specify up to 245 single-byte characters. The following characters and tabs cannot be specified: , < > *Note* ▪ When a value other than the default value is specified, paths within the installation directory cannot be specified. ▪ Values specified as other instance output destinations cannot be specified.
log_size (see *Note 1*)	Specify the maximum size of an agent log file (see *Note 2*). This can be 1 to 32 (units: MB), with a default value being 16. Note that we recommend a value of 16 or higher.

Note 1:

When Agent for Oracle is upgraded from a version earlier than 5.5, the default values are set.

Note 2:

Up to four agent log files are collected per instance. When specifying the value of `log_size`, make sure that it satisfies the following condition (including when the default value is used for `log_path`).

free-space-on-the-disk-specified-for-log_path (MB) > *value-of-log_size* × 4

If the hard disk does not have enough free space, an output error occurs for the agent logs. For details on agent logs, see the *HiCommand Tuning Manager Agent Administration Guide*.

Use the `jpcinssetup` command to construct an instance environment.

To construct an instance environment:

1. Execute the `jpcinssetup` command with the service key and instance name (no more than 32 bytes) specified.

   For example, to construct an instance environment for the instance named SDC for Agent for Oracle, execute the following command:

   ```
   jpcinssetup agto -inst SDC
   ```

   Note: Use an instance name that is unique among all the names of the Agent instances on the network. Note that you cannot use `sql` as the instance name.

2. Set up the instance information for the Oracle you will monitor.

   Enter the information shown in Table 7.24, in accordance with the command's instructions. To use the displayed default value, press the **Enter** key.

3. To perform the operation with multiple instances, repeat steps 1 and 2 for each instance.

7.5.2.2 About the Constructed Instance Environment

Once you have entered all items, the instance environment is constructed. Described below are the organization of directories for instance environments and the service ID for an instance environment.

Organization of Directories for Instance Environments

Instance environments are constructed under the following directory:

- Windows: *installation-folder*\agto
- UNIX: /opt/jp1pc/agto

Table 7.25 shows the organization of the directories for instance environments.

Table 7.25 Organization of Directories for Instance Environments (Agent for Oracle)

Directory and File Names			Description
agent	*instance-name*	jpcagt.ini	Startup-information file of the Agent Collector service
		jpcagt.ini.model See *Note*	Model file for the startup-information file of the Agent Collector service
		jpc0collect.exe (for Windows) jpc0collect (for UNIX)	Performance data collection program of the Agent Collector service
		log	Directory for storing internal log files of the Agent Collector service
store	*instance-name*	*.DAT	Data model definition file
		backup	Default directory for backing up the database
		dump	Default directory for exporting the database
		jpcsto.ini	Startup-information file of the Agent Store service
		jpcsto.ini.model See *Note*	Model file for the startup-information file of the Agent Store service
		log	Directory for storing internal log files of the Agent Store service

Note: Use this file to restore the settings that were in effect before the instance environment was constructed.

Service ID for an Instance Environment

The following is the service ID for an instance environment:

product-ID function-ID instance-number instance-name [*host-name*]

The *instance-name* is specified with the `jpcinssetup` command. For details about service IDs, see the *HiCommand Tuning Manager Agent Administration Guide*.

Windows Service Name for an Instance Environment

The following are Windows service names for an instance environment:

- Agent Collector: `PFM - Agent for Oracle` *instance-name*
- Agent Store: `PFM - Agent Store for Oracle` *instance-name*

The *instance-name* is specified with the `jpcinssetup` command. For details about the Windows service name, see the *HiCommand Tuning Manager Agent Administration Guide*.

7.5.2.3 Registering Objects in the Oracle Database

To monitor an Oracle database, Agent for Oracle must register an object used for obtaining performance data for the monitored Oracle database. This object is registered using the `sp_inst.sql` SQL script provided by Agent for Oracle.

The user account executing the `sp_inst.sql` script needs to have the following privileges:

- CREATE SESSION
- CREATE TABLE
- CREATE PROCEDURE
- SELECT ANY DICTIONARY

The following table lists the reasons why these privileges are needed.

Table 7.26 Privileges Required for the User Account that Executes the sp_inst.sql Script and Reasons Why They Are Required

Privilege	Reason
CREATE SESSION	Needed to establish a session with the monitored Oracle database.
▪ CREATE TABLE ▪ SELECT ANY DICTIONARY	Needed to register the LSC_13_PLAN_TABLE table for the monitored Oracle database, to allow Agent for Oracle to monitor the database.

Privilege	Reason
▪ CREATE PROCEDURE ▪ SELECT ANY DICTIONARY (see #)	Needed to register the following monitoring procedures for the monitored Oracle database, to allow Agent for Oracle to monitor the database: ▪ LSC_13_PDAS ▪ LSC_13_PICS ▪ LSC_13_73_PDDB ▪ LSC_13_PDI ▪ LSC_13_717273_PDMT ▪ LSC_13_PDS3 ▪ LSC_13_73_PIDB ▪ LSC_13_PIDB2

#:

The SELECT ANY DICTIONARY system privilege is only needed when Oracle9i or Oracle 10g is monitored.

Note:

The maximum allocation size for the default tablespace of the user account executing `sp_inst.sql` needs to be set to 64 KB or greater.

To use Agent for Oracle to monitor an Oracle database, you must register the objects provided by Agent for Oracle in the applicable Oracle database. To do this, you execute an SQL script provided by Agent for Oracle; the procedure is explained below. The following operations are required only once for each account that monitors an Oracle database instance.

To register objects in the Oracle database:

1. Set up an environment in which Oracle's `sqlplus` command can be executed.

   For details about Oracle environment setup, refer to your Oracle documentation.

2. Move to the following directory that is provided by Agent for Oracle and which contains `sp_inst.sql`:

   – Windows: *installation-folder*`\agto\agent\sql`

   – UNIX: `/opt/jp1pc/agto/agent/sql`

3. Execute the `sp_inst.sql` script on the Oracle database that is to be monitored.

   In Oracle, register the object (such as a monitoring procedure or work table) that Agent for Oracle requires for monitoring Oracle.

   *Example***:**

   `sqlplus` *Oracle-account@name-of-the-net-service-for-database-to-be-monitored/password-for-Oracle-account* `@sp_inst.sql`

   – `sqlplus` is a command provided by Oracle Corporation.

– For the Oracle account, specify the value of `oracle_user`. The object will be created in the database with the specified Oracle account. You will have to use the same Oracle account if you cancel environment setup.

– When using the `sys` account as the Oracle account, if you execute the `sp_inst.sql` script without the `AS SYSDBA` or `AS SYSOPER` option specified, an error might occur. In such a case, re-execute the script with the `AS SYSDBA` or `AS SYSOPER` option specified.

This command creates the `LSC_13_PLAN_TABLE` table and the following packages:

`LSC_13_PDAS`, `LSC_13_PICS`, `LSC_13_73_PDDB`, `LSC_13_PDI`, `LSC_13_717273_PDMT`, `LSC_13_PDS3`, `LSC_13_73_PIDB`, `LSC_13_PIDB2`

7.5.2.4 Setting up the Oracle Database

For some records provided by Agent for Oracle, you must change to `TRUE` the value of the Oracle database `TIMED_STATISTICS` initialization parameter in order to collect performance data.

Table 7.27 Items that Require the TIMED_STATISTICS=TRUE Setting in Order to Collect Performance Data

Record	Field	Remarks
Block Contention Interval (`PI_PIBC`)	Not applicable	Entire record
Block Contention Statistics (`PD_PDBC`)		
Data File Interval (`PI_PIDF`)	Write Time (`WRITE_TIME`)	Not applicable
Session Detail (`PD_PDS`)	Avg Wait (`AVERAGE_WAIT`)	
	Avg Wait String (`AVERAGE_WAIT_STRING`)	
	Time Waited (`TIME_WAITED`)	
	Time Waited String (`TIME_WAITED_STRING`)	
Session Event (`PD_PDEV`)	Avg Wait (`AVERAGE_WAIT`)	
	Avg Wait String (`AVERAGE_WAIT_STRING`)	
	Time Waited (`TIME_WAITED`)	
	Time Waited String (`TIME_WAITED_STRING`)	

Session Event Interval (PI_PIEV)	Avg Wait (AVERAGE_WAIT)	
	Avg Wait String (AVERAGE_WAIT_STRING)	
	Time Waited (TIME_WAITED)	
	Time Waited String (TIME_WAITED_STRING)	
Session Stat Summary Interval (PI_PIS2)	Statement CPU (STATEMENT_CPU)	
Session Statistics Summary (PD_PDS2)	Statement CPU (STATEMENT_CPU)	
Session Wait (PD_PDWA)	Wait Time (WAIT_TIME)	
	Wait Time String (WAIT_TIME_STRING)	
System Event (PD_PDSE)	Avg Wait (AVERAGE_WAIT)	Not applicable
	Time Waited (TIME_WAITED)	
System Event Interval (PI_PISE)	Avg Wait (AVERAGE_WAIT)	
	Time Waited (TIME_WAITED)	

Notes:

- If you modify the initialization parameters file, you must restart the instance's database.
- Oracle 9i and later versions support the server parameters file that stores Oracle parameter information. Any value change you make in the server parameters file takes precedence over a change made to the initialization parameters file.
- Setting the TIMED_STATISTICS initialization parameter to TRUE may have adverse effects on the performance of the Oracle database. If you plan to use this setting, you should first evaluate the possible effects. For details, refer to your Oracle documentation.

7.5.3 Canceling Setup of an Instance Environment

This section describes canceling setup of an instance environment. To cancel setup of multiple instance environments, you must repeat the following procedures for each environment:

- Delete the Agent's instance environment on the Agent host
- Delete the objects registered in the Oracle database
- Delete an Oracle account for Agent for Oracle
- Delete the Agent's instance information on the Tuning Manager host

7.5.3.1 Deleting the Agent's Instance Environment on the Agent Host

To delete the Agent's instance environment on the Agent host:

1. Find the instance name of Agent for Oracle using the jpcinslist command. The command format is as follows:

   ```
   jpcinslist agto
   ```

   For example, if the instance name is SDC, the command displays `SDC`.

2. Stop the Agent for Oracle service in the instance environment if it is active.

3. Delete the instance environment using the `jpcinsunsetup` command. The command format is as follows:

   `jpcinsunsetup agto -inst` *instance-name*

   ***Example*:**

   To delete an instance environment whose instance name is SDC:

   ```
   jpcinsunsetup agto -inst SDC
   ```

   If the command is successful, the Windows services and directories created during instance environment setup are deleted. If a service with the specified instance name is active, a message appears asking whether the service is to be stopped.

7.5.3.2 Deleting the Objects Registered in the Oracle Database

The `sp_drop.sql` script is used to delete from the Oracle database the object used by Agent for Oracle to obtain performance data. The CREATE SESSION privilege must be granted to the user account executing the `sp_drop.sql` script. This privilege is needed to establish a session with the monitored Oracle database.

This section describes the procedure for deleting the table and packages that were created in the Oracle database being monitored. To execute this procedure, you must use the same Oracle account as when you registered the objects in the Oracle database. The following operations are required only once for each account that monitors an Oracle database instance.

***Note*:** If you execute the procedure described below when no objects have been registered in the Oracle database, an Oracle error message is displayed during execution of the `sp_drop.sql` script.

To delete the objects registered in the Oracle database being monitored:

1. Set up an environment where the `sqlplus` Oracle command can be executed.

   For details about Oracle environment setup, refer to your Oracle documentation.

2. Move to the following directory that contains the `sp_drop.sql` script provided by Agent for Oracle:

   - Windows: *installation-folder*`\agto\agent\sql`
   - UNIX: `/opt/jp1pc/agto/agent/sql`

3. Execute the `sp_drop.sql` script on the Oracle database being monitored.

From Oracle, delete the object (such as a monitoring procedure or work table) that Agent for Oracle requires for monitoring Oracle.

Example:

```
sqlplus
Oracle-account@name-of-the-net-service-for-database-to-be-monitored/password-for-Oracle-account @sp_drop.sql
```

- `sqlplus` is a command provided by Oracle Corporation.
- In Oracle-account, specify the same Oracle account used when the objects were registered in the database.

4. Restore the Oracle initialization parameter to its original setting.

   If the value of the Oracle initialization parameter `TIMED_STATISTICS` has been changed so that Agent for Oracle can collect records, restore it to its original setting if necessary.

7.5.3.3 Deleting an Oracle Account

To monitor Oracle databases, the Oracle account for Agent for Oracle is granted permissions to freely manipulate objects in other schema. Because of this, you must delete any unnecessary Oracle accounts. If the tablespace allocated for an Oracle account is also no longer necessary due to the deletion of the account, then remove the tablespace.

Deleting an Oracle account

To delete an Oracle account, issue the `DROP USER` statement in an environment where the Oracle `sqlplus` command can be executed, as shown in the following example:

```
DROP USER Oracle-account CASCADE;
```

To issue the `DROP USER` command, the Oracle account must have the DROP USER system privileges. For details about the `DROP USER` statement, refer to the Oracle documentation.

Note: You can use the `CASCADE` option to simultaneously delete the objects belonging to the account.

Removing the tablespace used by the deleted Oracle account

To remove a tablespace that is no longer necessary due to the deletion of an Oracle account, issue the `DROP TABLESPACE` statement in an environment where the Oracle `sqlplus` command can be executed. To issue the `DROP TABLESPACE` statement, the Oracle account must have the DROP TABLESPACE system privileges.

For details about the `DROP TABLESPACE` statement, refer to the Oracle documentation.

7.5.3.4 Deleting the Agent's Instance Information on the Tuning Manager Host

To delete the Agent's instance information on the Tuning Manager host:

1. On the Tuning Manager host, execute the `jpcctrl delete` command to delete the Agent's instance information.

   For example, to delete the instance information when the instance name is SDC, the host name is host03, the Agent Collector service ID is OA1SDC[host03], and the Agent Store service ID is OS1SDC[host03]:

   - Windows: `jpcctrl delete O?1SDC[host03] host=host03`
   - UNIX: `jpcctrl delete "O?1SDC[host03]" host=host03`

2. Restart the Collection Manager service.
3. Restart Performance Reporter.

7.5.4 Updating an Instance Environment

Updating an instance environment involves checking the instance name (using the `jpcinslist` command), then updating the instance environment (using the `jpcinssetup` command). For details about Oracle instance information, refer to the Oracle documentation.

To update multiple instance environments, repeat the following procedure for each instance environment.

To update an instance environment:

1. Find the instance name by executing the `jpcinslist` command, specifying the service key of the Agent for Oracle running in the instance environment.

   For example, to check the instance name of Agent for Oracle, execute the following command:

   ```
   jpcinslist agto
   ```

   If the specified instance name is SDC, the command displays `SDC`.

2. Check the information of the instance environment to be updated (see Table 7.28 at the end of these instructions).
3. If the Agent for Oracle service is active in the instance environment that is to be updated, stop the service.
4. Execute the `jpcinssetup` command, specifying the service key and instance name of the Agent for Oracle in the instance environment that you wish to update.

   For example, if you are updating the instance environment for the Agent for Oracle with instance name SDC, execute the following command:

   ```
   jpcinssetup agto -inst SDC
   ```

5. If the service is still active in the instance environment that is to be updated when you execute the `jpcinssetup` command, a confirmation message is displayed to enable you to stop the service.

   If you stop the service, update processing resumes; if you do not stop the service, update processing is cancelled.

6. Enter the information shown in Table 7.28 in accordance with the command's instructions to update the instance information.

   The current settings are displayed (except for the value of `oracle_passwd`). To use the displayed value, press the **Enter** key. When all entries are completed, the instance environment is updated.

7. Restart the service in the updated instance environment.

Table 7.28 Whether the Instance Information for Agent for Oracle Can be Updated

Item	Description
`oracle_sid`	You cannot update this value; the current setting is displayed only.
`oracle_home`	
`oracle_version`	
`oracle_user`	You can update this value. As the account for monitoring Oracle, specify an account that can reference and execute SYS schema objects.# The previously specified value is used by default. You can specify up to 255 single-byte characters. The following characters, spaces, and tabs cannot be specified: `,  <  >`
`oracle_passwd`	You can update this value. Specify a password for the account that was specified in `oracle_user`. You can specify up to 255 single-byte characters. The following characters, spaces, and tabs cannot be specified: `,  <  >`
`sqlnet`	You cannot update this value; the current setting is displayed only.
`net_service_name`	
`listener_home`	
`listener_name`	You can update this value. Specify the new listener name. The previously specified value is used by default. You can specify up to 255 single-byte characters. The following characters, spaces, and tabs cannot be specified: `,  <  >`
`retry_time`	Note that this item can be set in the Windows environment only. You cannot update this value; the current setting is displayed only.
`log_path`	You can update this value. Specify the full path of the output directory for agent logs. The previously specified value is used by default. You can specify up to 245 single-byte characters. The following characters and tabs cannot be specified: `,  <  >` *Notes:* ▪ When a value other than the default value is specified, paths within the installation directory cannot be specified. ▪ Values specified as other instance output destinations cannot be specified.
`log_size`	You can update this value. Specify the maximum size of an agent log file. The previously specified value is used by default. You can specify a value from 1 to 32 (units: KB). Note that we recommend a value of 16 or higher.

#:

Perform the following to change the user:

a) Delete the object created by the old user.

b) Register a new object for the new user.

Note that performance data is not deleted when the user is changed.

For details on how to delete objects, see section 7.5.3.2. For details on how to register objects, see section 7.5.2.3.

***Note*:** If you need to change an item that cannot be updated, you must delete the instance environment and then re-create it.

7.5.5 Setting up Agent for Oracle in a Cluster System

This section describes setup for using Agent for Oracle in a cluster system. Setup procedures differ for an executing node and standby node. Perform setup for the executing node first, and then for the standby node.

Note: If you set up an Agent in a logical host environment, the settings of the Agent in the physical host environment will not be inherited. For both logical and physical host environments, the instance environment is newly created when the instance environment is set.

7.5.5.1 Setting up the Executing Node's Logical Host Environment

Set up a logical host environment for Agent for Oracle in the executing node. The procedure is as follows:

Note: Before performing setup, terminate all the services of Collection Manager and the Agent in the entire Tuning Manager system.

1. Mount the shared disk.

   Make sure that the shared disk is mounted. If it is not, use cluster software or a volume manager to mount it.

2. Set up a logical host environment for Agent for Oracle.

   Execute the `jpchasetup create` command to create a logical host environment.

   This command copies required data to the shared disk, sets definitions for a logical host, and creates a logical host environment.

   To create a logical host environment:

   a) Execute the `jpchasetup create` command to create a logical host environment for Agent for Oracle, as shown in the following example:

      Windows: `jpchasetup create agto -lhost tm1-ha1ora -d S:\tm1`

      UNIX: `jpchasetup create agto -lhost tm1-ha1ora -d /tm1`

      Use the `-lhost` option to specify the logical host name. In this example, `tm1-ha1ora` is specified as the logical host name. If DNS is used, specify the logical host name without the domain name.

      Specify the directory name of the shared disk as the environment directory name in the `-d` option. For example, if you specify `-d S:\tm1` on a Windows host, then `S:\tm1\jp1pc` will be created and a file for the logical host environment will be created. If you specify `-d /tm1` in a UNIX host, then `/tm1/jp1pc` will be created and a file for a logical host environment will be created.

   b) Execute the `jpchasetup list` command to check that the setting of the created logical host environment is correct, as shown in the following example:

      ```
      jpchasetup list all
      ```

3. Set the connection-target Tuning Manager.

   Execute the `jpcnshostname` command to specify the Tuning Manager that will manage Agent for Oracle, as shown in the following example:

   ```
   jpcnshostname -s tm1 -lhost tm1-ha1ora
   ```

   Use the `-s` option to specify the host name of connection-target Tuning Manager. When the connection-target Tuning Manager is running on a logical host, specify the logical host name of the connection-target Tuning Manager by using the `-s` option. In this example, the host name of Tuning Manager is specified as `tm1`.

   Also, use the `-lhost` option to specify the logical host name of Agent for Oracle. In this example, the logical host name of Agent for Oracle is specified as `tm1-ha1ora`.

4. Create an Oracle account to be used by Agent for Oracle.

Create an Oracle account that has the system privileges required to monitor Oracle databases and collect performance information through Agent for Oracle. For details on how to create an Oracle account, see section 7.5.1.

Note: This setup procedure is not necessary if you use the `sys` account.

5. Set up an instance environment.

   a) Execute the `jpcinssetup` command to set up an instance environment for Agent for Oracle, as shown in the following example:

      ```
      jpcinssetup agto -lhost tm1-ha1ora -inst SDC1
      ```

      Use the `-lhost` option to specify the logical host name. In this example, the logical host name of Agent for Oracle is specified as `tm1-ha1ora`, and the instance name is `SDC1`.

   b) Set up an instance environment.

      An instance environment is set up in the same way as for a non-cluster system. For details on what is to be set up, see section 7.5.2.

6. Register objects in the Oracle database.

   You need to register the objects (such as monitoring procedures and work tables) required to use Agent for Oracle to monitor an Oracle database. To register the objects, use an SQL script provided by Agent for Oracle. For details on how to do this, see section 7.5.2.3.

7. Set up logical host environments for Collection Manager and other Agents.

   If you set up Collection Manager and any Agents other than Agent for Oracle on the same logical host, set up logical host environments for them now.

   For details about the setup procedure for Collection Manager, see section 3.3.1. For details about the setup procedure for each Agent, see the section in this chapter that describes the setup procedure for your Agent.

8. Set a port number.

   You need to perform this setup only when Tuning Manager series programs are used in a network environment with a firewall. If communications among the Tuning Manager series programs are via a firewall, specify a port number by using the `jpcnsconfig port` command.

   For details about setting port numbers, see section 6.4. For details about the list of the port numbers, see the *HiCommand Tuning Manager Agent Administration Guide*.

9. Set an IP address.

   You can specify an IP address when using Tuning Manager series programs in a network environment with more than one LAN connected. To specify an IP address, edit the `jpchosts` file directly.

   For details on setting an IP address, see section 6.5.

   Note: After editing the `jpchosts` file, copy it from the executing node to the standby node.

10. Export the definitions of the logical host environment.

    After creating a logical host environment for Agent for Oracle, export the environment definitions to a file. All the definitions of the Collection Manager and Agents that are set up on the logical host will be output to the file. If you set up Collection Manager and any Agents other than Agent for Oracle on the same logical host, export the definitions after you finish the setup.

    To export the definitions of the logical host environment, execute the `jpchasetup export` command. This command will output, to an export file, the definitions of the logical host environment that has been created. The export file may have any name. For example, to export the definitions of the logical host environment to the `lhostexp.txt` file, execute the following command:

    ```
    jpchasetup export -f lhostexp.txt
    ```

11. Copy the exported file to the standby node.

    Copy the file that you exported at step 10 from the executing node to the standby node.

12. Unmount the shared disk.

    End operations by unmounting the shared disk on the Windows host, or the file system on the UNIX host. To unmount the shared disk on the Windows host, use cluster software or a volume manager. To continue to use the shared disk, you do not have to unmount the shared disk or file system.

    Note specific to UNIX hosts: If there is a `jp1pc` directory in the specified environment directory, and there are files under the `jp1pc` directory despite the shared disk being unmounted, setup was performed while the shared disk was not mounted. In such a case, perform the following procedure to resolve the problem:

    a) Use the `tar` command to archive the `jp1pc` directory in the specified environment directory on the local disk.

    b) Mount the shared disk.

    c) If the specified environment directory does not exist on the shared disk, create the environment directory.

    d) From the `tar` file created at (a), extract the archived directory into the environment directory on the shared disk.

    e) Unmount the shared disk.

    f) Delete the `jp1pc` directory and its subordinates from the specified directory on the local disk.

7.5.5.2 Setting up the Standby Node's Logical Host Environment

Set up a logical host environment for Agent for Oracle in the standby node. To set up the logical host environment, import, to the standby node, the definitions of the logical host environment that were exported at the executing node.

To import the definitions of the logical host environment for Agent for Oracle, use the `jpchasetup import` command. If more than one Collection Manager or Agent has been set up on a single logical host, all the definitions are imported at the same time.

You do not have to mount the shared disk to execute this command.

To set up the logical host environment for the standby node:

1. Execute the `jpchasetup import` command to import the definitions of the logical host environment, as shown in the following example:

   ```
   jpchasetup import -f lhostexp.txt
   ```

   This command will change the environment settings for the standby node to those in the export file. This will set up the environment for starting the Collection Manager and Agents on the logical host.

   The fixed port number specified by the `jpcnsconfig port` command during setup for the executing node will also be imported.

2. Execute the `jpchasetup list` command to check that the setting of the logical host environment is the same as that for the executing node, as shown in the following example:

   ```
   jpchasetup list all
   ```

Note: After editing the `jpchosts` file, copy it from the executing node to the standby node.

7.5.5.3 Registering Agent for Oracle in the Cluster Software

To use an Agent in a logical host environment, register it in the cluster software. This registration sets up the environment so that the Agent can be started or terminated via control from the cluster software.

This section describes how to register Agent for Oracle in the cluster software separately for each OS.

For Windows

The example below describes the settings specified when registering Agent for Oracle in the cluster software on a Windows host. The example uses Windows 2000 MSCS as the cluster software. For Agent for Oracle, you need to register the following services in the cluster software.

Table 7.29 Agent for Oracle Services to Be Registered in Cluster Software

Displayed Name	Service Name	Dependency
PFM - Agent Store for Oracle *instance-name* [*lhost*]	JP1PCAGT_OS_*instance-name* [*lhost*]	IP address resource Oracle Database resource Physical disk resource
PFM - Agent for Oracle *instance-name* [*lhost*]	JP1PCAGT_OA_*instance-name* [*lhost*]	Cluster resource for PFM – Agent Store for Oracle *instance-name* [*lhost*]
PFM - Action Handler [*lhost*]	JP1PCMGR_PH [*lhost*]	IP address resource Physical disk resource

Note: Replace *lhost* by a logical host name. For example, if the instance name is `SDC1` and the logical host name is `tm1-ha1ora`, the displayed name of the service will be `PFM - Agent Store for Oracle SDC1 [tm1-ha1ora]`, and the service name will be `JP1PCAGT_OS_SDC1 [tm1-ha1]`.

The above services are registered as resources of MSCS. Set the resources as described below. The bold text below indicates items to be set for MSCS.

- Set **Type of resource** to **Generic service**.
- Set **Name**, **Service name** and **Dependency** as shown in Table 7.29.

  Note that a name in the *Displayed name* column is the name of a service, and a name in the *Service name* column is used to specify a service to be controlled from MSCS.
- Do not set **Startup parameter** and **Registry replication**.
- Set the **Details** page of the properties according to whether you want the system to fail over when a failure occurs with the Agent.

  Normally you specify settings so that no failover occurs. If you want the system to fail over, set this page as follows:
  - **Restart**: Select this item.
  - **Apply to a group**: Do not select this item.
  - **Threshold** for the number of restart retries: `3` (the recommended value)

Note: The cluster software controls the starting and stopping of the services to be registered. Thus, set **Type of startup** to **Manual** so that the services will not start automatically when the OS starts up. The type of startup for a service is set to **Manual** immediately after the service is set up by the `jpchasetup create` command.

For UNIX

The example below describes the settings specified when registering Agent for Oracle in the cluster software on a UNIX host. There are four items required for registering an application in the UNIX cluster software: Startup, Stop, Monitoring and Forced stop.

Table 7.30 Control Method for Agent for Oracle Registered in Cluster Software

Item	Description
Startup	Execute the following commands in the following order to start the Agent for Oracle: `/opt/jp1pc/tools/jpcstart act lhost=`*logical-host-name* `/opt/jp1pc/tools/jpcstart agto lhost=`*logical-host-name* `inst=`*instance-name* Start the Agent after the shared disk and the logical IP address become available.
Stop	Execute the following commands in the following order to stop the Agent for Oracle: `/opt/jp1pc/tools/jpcstop agto lhost=`*logical-host-name* `inst=`*instance-name* `/opt/jp1pc/tools/jpcstop act lhost=`*logical-host-name* Stop the Agent before the shared disk and the logical IP address are made unavailable. If services are stopped because of a failure, the return value of the `jpcstop` command is 3. Consider such a case as a normal end because the services are inactive. If the cluster software uses the return value to determine the execution result, make the return value 0.

Monitoring	Use the `ps` command to check that the processes below are running:
	`ps -ef | grep "`*process-name logical-host-name*`" | grep -v "grep `*process-to-be-monitored*`"`
	The following processes are to be monitored:
	`jpcagto`, `agto/jpcsto`, and `jpcah`
	For details about process names, see the *HiCommand Tuning Manager Agent Administration Guide*. In some situations, Agents need to be temporarily stopped. For such situations, provide a method for suppressing monitoring (such as not monitoring files while they are undergoing maintenance).

Forced stop	If forced stop is required, use the following command: `/opt/jp1pc/tools/jpcstop all lhost=`*logical-host-name* `kill=immediate` You can specify only `all` as a service key in the first argument. *Note*: By sending SIGKILL, this command performs a forced stop of all the processes of the Collection Manager and Agents running in the specified logical host environment. At this time, the Collection Manager and Agents are stopped not on the service level but on the logical host level. Forced stop must be set up only for the cases in which execution of an ordinary stop cannot stop the system.

Notes:

- The cluster software controls the starting and stopping of the Agent to be registered. Do not set up the Agent to start automatically when the OS starts.
- If the cluster software uses the return value of the `jpcstart` command or the `jpcstop` command to evaluate the execution result, specify the settings so that the return value of these commands is converted to the value expected by the cluster software. For details on the return values of the `jpcstart` command and the `jpcstop` command, see the *HiCommand Tuning Manager Command Line Interface Guide*.
- The length of characters to be displayed by the `ps` command varies with the OS. The length must be 47 or fewer characters when a logical host name and an instance name are added together. When you use the `ps` command for monitoring, make sure all the logical hosts are displayed by the `ps` command beforehand. If not all the characters are displayed, specify settings so that only the displayed characters are monitored.

7.5.5.4 Checking Starting and Stopping

To check normal operation, use the cluster software to start and stop Agent for Oracle at each node.

7.5.6 Canceling Setup in a Cluster System

This section describes how to cancel setup of Agent for Oracle in a cluster system. Procedures for canceling setup differ for an executing node and standby node. Cancel the setup of Agent for Oracle first for the executing node and then for the standby node.

Note: Before canceling setup, stop all the services of Collection Manager and the Agents that are running on the executing and standby nodes whose setup is to be canceled.

7.5.6.1 Canceling Setup of the Executing Node's Logical Host Environment

In the executing node, cancel setup of the logical host environment of Agent for Oracle. The procedure is as follows:

1. Mount the shared disk.

   Make sure that the shared disk is mounted. If it is not, use cluster software or a volume manager to mount it.

   Note specific to UNIX hosts: If there is a `jp1pc` directory in the specified environment directory, and there are files under the `jp1pc` directory despite the shared disk being unmounted, setup was performed while the shared disk was not mounted. In such a case, carry out the following procedure to resolve the problem:

   a) Use the `tar` command to archive the `jp1pc` directory in the environment directory of the logical host for which you want to cancel setup on the local disk.

   b) Mount the shared disk.

   c) If the environment directory of the logical host for which you want to cancel setup does not exist on the shared disk, create the environment directory.

   d) Expand the `tar` file in the environment directory of the logical host on the shared disk for which you want to cancel setup.

   e) Unmount the shared disk.

   f) Delete the `jp1pc` directory and its subordinates that are in the environment directory on the logical host whose setup you want to cancel, on the local disk.

2. Cancel setup of a port number.

   This procedure is required only when a port number was specified by the `jpcnsconfig port` command during setup in an environment with a firewall.

   To cancel setup of a port number, set "`0`" as the port number. For details about setting port numbers, see section 6.4.

3. Cancel setup of Agent for Oracle in a logical host environment.

Execute the `jpchasetup delete` command to delete the logical host environment, as shown in the following example. In this example, the logical host name of Agent for Oracle is specified as `tm1-ha1ora` and the instance name as `SDC1`.

Note: If you delete a logical host environment while the shared disk is not mounted, only the setting of the logical host on the physical host will be deleted and the directories and files on the shared disk will not be deleted. In such a case, you must mount the shared disk and manually delete the `jp1pc` directory under the environment directory.

To delete the logical host environment:

a) Execute the `jpchasetup list` command to check the settings of the logical host environment to be deleted, such as the logical host name and the path to the shared disk, as shown in the following example:

```
jpchasetup list all -lhost tm1-ha1ora
```

b) Execute the `jpcinsunsetup` command to delete the instance environment of Agent for Oracle, as shown in the following example:

```
jpcinsunsetup agto -lhost tm1-ha1ora -inst SDC1
```

When you execute the `jpcinsunsetup` command, the setting to start up the instances on the logical host will be deleted. At the same time, the files for the instances will be deleted from the shared disk.

c) Execute the `jpchasetup delete` command to delete the logical host environment of Agent for Oracle, as shown in the following example:

```
jpchasetup delete agto -lhost tm1-ha1ora
```

When you execute the `jpchasetup delete` command, the setting to start up Agent for Oracle on the logical host will be deleted. At the same time, the file for the logical host will be deleted from the shared disk.

d) Execute the `jpchasetup list` command to check that Agent for Oracle has been deleted from the logical host environment, as shown in the following example:

```
jpchasetup list all
```

e) Delete objects from the Oracle Database that Agent for Oracle requires to monitor Oracle (such as monitoring procedures and work tables) using the SQL deletion script. For details on how to delete objects from the Oracle Database, see section 7.5.3.2.

f) If you changed the value of the Oracle initialization parameter `TIMED_STATISTICS` so that Agent for Oracle can collect records, restore the parameter to its original setting (if necessary).

g) Delete the Oracle account that is no longer used by Agent for Oracle. If tablespaces used by the account also become unnecessary due to deleting the account, then delete the tablespaces. For details on how to delete an Oracle account, see section 7.5.3.3.

4. Cancel setup of the logical host environments for Collection Manager and other Agents.

If you cancel setup of Collection Manager and any Agents other than Agent for Oracle from the same logical host, cancel setup of the logical host environments for them now.

For details about the procedure for canceling setup of Collection Manager, see section 8.1.3. For details about the procedure for canceling setup of each Agent, see the section in this chapter that describes the procedure for your Agent.

5. Export the definitions of the logical host environment.

   After deleting the logical host environment for Agent for Oracle, export the environment definitions to a file.

   To export the definitions of the logical host environment, use the `jpchasetup export` command. This command will output the definitions of the logical host environments for Collection Manager and the Agents to an export file. The export file may have any name. For example, to export the definitions of the logical host environment to the `lhostexp.txt` file, execute the following command:

   ```
   jpchasetup export -f lhostexp.txt
   ```

   Collection Manager and the Agents make the environment of the executing node match that of the standby node by exporting and importing the environment definitions.

   If you import to the standby node the environment definitions exported at the executing node (where environment definitions of Collection Manager and the Agents were deleted), they will be compared with the existing environment definitions of the standby node (where the definitions of Collection Manager and the Agents remain without being deleted). Then, differences (that is, the environment definitions of Collection Manager and the Agents that were deleted at the executing node) will be deleted from the standby node.

6. Copy the exported file to the standby node.

   Copy the logical host environment definition file that you exported at step 5 from the executing node to the standby node.

7. Unmount a shared disk.

   End operations by unmounting the shared disk on the Windows host, or the file system on the UNIX host. To unmount the shared disk on the Windows host, use cluster software or a volume manager. To continue to use the shared disk, you do not have to unmount the shared disk or file system.

7.5.6.2 Canceling Setup of the Standby Node's Logical Host Environment

Cancel setup of the logical host environment for Agent for Oracle at the standby node. To cancel setup, copy the definitions of the logical host environment exported at the executing node to the standby node.

You do not have to unmount the shared disk to cancel setup at the standby node.

To cancel setup of the logical host environment at the standby node:

1. Execute the `jpchasetup import` command to import the definitions of the logical host environment, as shown in the following example:

   ```
   jpchasetup import -f lhostexp.txt
   ```

   This command will change the environment settings for the standby node to those in the export file. This means the setting to start Agent for Oracle of the logical host will be deleted. If setup is canceled for the Collection Manager and Agents on other logical hosts, those settings will also be deleted.

   The setup for the fixed port number specified by the `jpcnsconfig port` command during setup will also be canceled.

2. Execute the `jpchasetup list` command to check that the setting of the logical host environment is the same as that for the executing node, as shown in the following example:

   ```
   jpchasetup list all
   ```

7.5.6.3 Unregistering the Cluster Software

Delete, from the cluster software, the settings related to Agent for Oracle on a logical host. For details on the deletion procedure, see the documentation for the cluster software.

7.5.6.4 Deleting Settings at Tuning Manager

Delete the definitions related to Agent for Oracle whose setup is to be canceled.

To delete the definitions:

1. Delete the Tuning Manager's Agent information.

   For example, if Tuning Manager is running on the logical host `tm1-ha1`, and Agent for Oracle is running on the logical host `tm1-ha1ora`, execute the following command in Tuning Manager:

   `jpcctrl delete` *service-ID* `host=tm1-ha1ora lhost=tm1-ha1`

   In *service-ID*, specify the service ID of the Agent to be deleted.

2. Restart the Collection Manager services.
3. Restart Performance Reporter.

7.6 Setting up Agent for Microsoft SQL Server

This section explains the setup that is required before you can use Agent for Microsoft SQL Server. To monitor Microsoft SQL Server, you need to set up an instance environment and to register a stored procedure. Before you start setting up Agent for Microsoft SQL Server, please read the following notes.

- You must enable shared memory on the Microsoft SQL Server side because Agent for Microsoft SQL Server uses shared memory to communicate with the Microsoft SQL Server. For details about how to enable shared memory and for other detailed information, refer to the Microsoft SQL Server documentation.
- In the memory settings for the Microsoft SQL Server, do not set the value for minimum query memory to less than the default of 1,024 KB. If you do, any attempts to query the Microsoft SQL Server will fail and data will become uncollectible.

7.6.1 Setting up an Instance Environment

You must specify instance information for the Microsoft SQL Server that Agent for Microsoft SQL Server will monitor. Table 7.31 lists the instance information items that are to be specified. Check this information before you start the setup procedure. For details about instance information and user authentication for Microsoft SQL Server, please refer to the Microsoft SQL Server documentation.

Table 7.31 Instance Information for Agent for Microsoft SQL Server

Item	Description
Microsoft SQL Server instance name	Specify the name of the monitored Microsoft SQL Server instance.
SQL_HOST	Specify the name of the host on which the monitored Microsoft SQL Server instance is running, as a single-byte string. The default is the name of the host on which Agent for Microsoft SQL Server is installed.
SQL_USER (see *Note 1*)	Specify the name of the Microsoft SQL Server user used for SQL Server authentication. The default is sa. User accounts with the same permissions as sa (fixed server role sysadmin member account) can be specified. Specify one single-byte character when Windows authentication is used.
SQL_PASSWORD (see *Note 1*)	Specify the password for the Microsoft SQL Server user name used for SQL Server authentication. The password corresponding to SQL_USER can be specified.
SQL_ERRORLOG	Specify the full path of the error log file for the monitored Microsoft SQL Server instance. The default output folder is C:\Program Files\Microsoft SQL Server\MSSQL\LOG\ERRORLOG. You can specify up to 512 single-byte characters. The following characters, spaces, and tabs cannot be specified: / : , ; * ? " < > |
STARTUP_PENDING (see *Note 2*)	Specify the pending time from when Agent for Microsoft SQL Server starts until transfer is performed to normal processing, from 0 to 3600 (unit: seconds). Pending is not performed when 0 is specified. The default value is 0. For details on the pending function, see section 7.6.8.

Item	Description
LOG_PATH (see *Note 2*)	Specify the full path of the output folder for agent logs. The default output folder is *installation-folder*\agtq\agent*instance-name*\log. You can specify up to 245 single-byte characters. The following characters and tabs cannot be specified: / : , ; * ? " < > |
LOG_SIZE (see *Note 2*)	Specify the maximum size of an agent log file (see *Note 3*). The default value is 16. Values from 1 to 32 (units: MB) can be specified, but we recommend a value of 16 or greater.
TIMEOUT	Specify the timeout value for queries to Microsoft SQL Server. Values from 1 to 3600 (units: seconds) can be specified. The default value is 60.
LOGIN_TIMEOUT	Specify the timeout value for connecting to Microsoft SQL Server. Values from 1 to 3600 (units: seconds) can be specified. The default value is 20.

Note 1:

As described in the following table, the Microsoft SQL Server authentication method differs depending on the Microsoft SQL Server user name specified for SQL_USER. For details on installing Microsoft SQL Server, Microsoft SQL Server instance information, and Microsoft SQL Server user authentication, refer to the Microsoft SQL Server documentation.

Table 7.32 Value of SQL_USER and Authentication Method

Value of SQL_USER	Value of SQL_PASSWORD	Authentication Method
sa	Password for the user sa	SQL Server authentication
	Nothing (when no password is set)	
Desired single-byte string	Password for the specified user	
	Nothing (when no password is set)	
One single-byte character	Not required (any entered value will be ignored)	Windows authentication

Note 2:

When Agent for Microsoft SQL Server is upgraded from a version earlier than 5.5, the default values are set.

Note 3:

Up to four agent log files are collected per instance. When specifying the value of LOG_SIZE, make sure that it satisfies the following condition (including when the default value is used for LOG_PATH).

free-space-on-the-drive-specified-for-LOG_PATH (MB) > *value-of-LOG_SIZE* × 4

If the hard disk does not have enough free space, an output error occurs for the agent logs. For details on agent logs, see the *HiCommand Tuning Manager Agent Administration Guide*.

Note: Agent for Microsoft SQL Server services will not start unless the instance environment is set up.

Use the `jpcinssetup` command to construct an instance environment.

To construct an instance environment:

1. Execute the `jpcinssetup` command with the service key and instance name (no more than 32 bytes) specified, as follows:

   `jpcinssetup agtq -inst` *instance-name*

   The *instance-name* to be specified should be as follows, depending on the installation method for Microsoft SQL Server:

   - When default installation of Microsoft SQL Server was performed:

     You must specify `default` for the *instance-name* (to monitor default instances), as follows:

     ```
     jpcinssetup agtq -inst default
     ```

     Note that names other than `default` cannot be specified.

   - When installation of Microsoft SQL Server was performed with a specified instance name:

     You must specify the *instance-name* so that it can be recognized as the instance of the Microsoft SQL Server. Specify the instance name that was entered at installation of the Microsoft SQL Server (the instance name of the Microsoft SQL Server to be monitored).

     Example:

     If Microsoft SQL Server was installed with the instance named SQL1, specify the *instance-name* as follows:

     ```
     jpcinssetup agtq -inst SQL1
     ```

2. Set up the instance information for the Microsoft SQL Server you will monitor.

   Enter the information shown in Table 7.31, in accordance with the command's instructions. To use the displayed default value, press the **Enter** key.

   As shown in Table 7.31, the process for how Microsoft SQL Server authentication is performed depends on the Microsoft SQL Server user name specified in SQL_USER. For details about how to install Microsoft SQL Server, as well as details about instance information and user authentication for Microsoft SQL Server, refer to the Microsoft SQL Server documentation.

3. To perform the operation with multiple instances, repeat steps 1 and 2 for each instance.

7.6.1.1 About the Constructed Instance Environment

Once you have entered all items, the instance environment is constructed. Execute the `jpcinssetup` command once more to update the instance environment in order to change the host name, user name, password, or error log file name. For details about updating an instance environment, see section 7.6.5.

Note: When using the `jpcinssetup` command to create an instance environment, even if you specify an instance name that does not exist on the Microsoft SQL Server, the command ends normally. However, when you start collecting records, the `KAVF21400-W` message is output to the common message log and Tuning Manager cannot connect to the monitored Microsoft SQL Server. In this case, specify the correct instance name, and then re-execute the `jpcinssetup` command.

Described below are the organization of folders for instance environments and the service ID for an instance environment.

Organization of Folders for Instance Environments

Instance environments are constructed under the following folder:

installation-folder`\agtq`

Table 7.33 lists the organization of the folders for instance environments.

Table 7.33 Organization of Folders for Instance Environments (Agent for Microsoft SQL Server)

Folder and File Names			Description
`agent`	*instance-name*	`jpcagt.ini`	Startup-information file of the Agent Collector service
		`jpcagt.ini.model` (see *Note*)	Model file for the startup-information file of the Agent Collector service
		`log`	Folder for storing internal log files of the Agent Collector service
`store`	*instance-name*	`*.DAT`	Data model definition file
		`backup`	Default folder for backing up the database
		`dump`	Default folder for exporting the database
		`jpcsto.ini`	Startup-information file of the Agent Store service
		`jpcsto.ini.model` (see *Note*)	Model file for the startup-information file of the Agent Store service
		`log`	Folder for storing internal log files of the Agent Store service

Note: Use this file to restore the settings that were in effect before the instance environment was constructed.

Service ID for an Instance Environment

The following is the service ID for an instance environment:

product-ID function-ID instance-number instance-name [*host-name*]

The *instance-name* is specified with the `jpcinssetup` command. For details about the service IDs, see the *HiCommand Tuning Manager Agent Administration Guide*.

Windows Service Name for an Instance Environment

The following are Windows service names for an instance environment:

- Agent Collector: `PFM - Agent for Microsoft(R) SQL Server` *instance-name*
- Agent Store: `PFM - Agent Store for Microsoft(R) SQL Server` *instance-name*

The *instance-name* is specified with the `jpcinssetup` command. For details about the Windows service name, see the *HiCommand Tuning Manager Agent Administration Guide*.

7.6.2 Registering the Stored Procedure

Register the `A4QHITACHIPROCSPDATABASES` stored procedure in the master database of the monitored Microsoft SQL Server instance.

This stored procedure is used when Agent for Microsoft SQL Server obtains a list of names and sizes of the database from Microsoft SQL Server. When the size of the database in the monitored instance is 2 TB or more, Agent for Microsoft SQL Server will fail to obtain the information if the `A4QHITACHIPROCSPDATABASES` stored procedure is not registered.

***Note*:** You cannot register the `A4QHITACHIPROCSPDATABASES` stored procedure if a stored-procedure-table-view that has the same name as that stored procedure exists in the master database of the monitored Microsoft SQL Server instance.

You can register the `A4QHITACHIPROCSPDATABASES` stored procedure by executing the `sp_inst.sql` script provided by Agent for Microsoft SQL Server.

To register the A4QHITACHIPROCSPDATABASES stored procedure:

1. Set up the environment where the `osql` utility of Microsoft SQL Server can be executed.

   The `osql` utility is provided by Microsoft. For details about the settings for the Microsoft SQL Server environment, refer to the documentation of Microsoft SQL Server.

2. Move to the folder in which the `sp_inst.sql` script is stored.

   The location of the storage folder is as follows:

   installation-folder`\agtq\sql`

3. Execute the `sp_inst.sql` script with the Microsoft SQL Server that is to be monitored specified.

The execution method for the script differs, depending on the type of monitored Microsoft SQL Server instance, and the authentication method used when connecting to Microsoft SQL Server. The following table shows the execution methods in each case.

Table 7.34 When Registering To a Default Instance

Authentication Method	Execution Method of the sp_inst.sql Script
SQL Server authentication	`osql -S` *host-name* `-U` *user-name* `-P` *password* `-d master -i sp_inst.sql`
Windows authentication	`osql -S` *host-name* `-E -d master -i sp_inst.sql`

Table 7.35 When Registering To an Instance that Has a Name

Authentication Method	Execution Method of the sp_inst.sql Script
SQL Server authentication	`osql -S` *host-name*`\`*instance-name* `-U` *user-name* `-P` *password* `-d master -i sp_inst.sql`
Windows authentication	`osql -S` *host-name*`\`*instance-name* `-E -d master -i sp_inst.sql`

Notes: The values that you have to specify are as follows:

- *host-name*: The name of a host where the monitored Microsoft SQL Server is running
- *instance-name*: The instance name of the monitored Microsoft SQL Server
- *user-name*: A user account that has the `sa` privilege or a privilege equal to the `sa` privilege (fixed server role, sysadmin member account)
- *password*: A password corresponding to the user name specified for *user-name*.

7.6.3 Canceling Setup of an Instance Environment

This section describes canceling setup of an instance environment. To cancel setup of multiple instance environments, you must repeat the following procedures for each environment:

- Delete the Agent's instance environment on the Agent host
- Delete the Agent's instance information on the Tuning Manager host

To delete the Agent's instance environment on the Agent host:

1. Find the instance name of Agent for Microsoft SQL Server using the `jpcinslist` command. The command format is as follows:

   ```
   jpcinslist agtq
   ```

   For example, if the instance name is SQL1, the command displays `SQL1`.

2. Stop the Agent for Microsoft SQL Server service in the instance environment if it is active.
3. Delete the instance environment using the `jpcinsunsetup` command. The command format is as follows:

jpcinsunsetup agtq -inst *instance-name*

Example:

To delete an instance environment whose instance name is SQL1:

```
jpcinsunsetup agtq -inst SQL1
```

If the command is successful, the Windows services and folders created during instance environment setup are deleted. If you specify `default` for the *instance-name*, the instance environment for monitoring the default Microsoft SQL Server instance will be deleted. If a service with the specified instance name is active, a message appears asking whether the service is to be stopped.

To delete the Agent's instance information on the Tuning Manager host:

1. On the Tuning Manager host, execute the `jpcctrl delete` command to delete the Agent's instance information.

   For example, to delete the instance information when the instance name is SQL1, the host name is host03, the Agent Collector service ID is QA1SQL1[host03], and the Agent Store service ID is QS1SQL1[host03]:

   ```
   jpcctrl delete Q?1SQL1[host03] host=host03
   ```

2. Restart the Collection Manager service.
3. Restart Performance Reporter.

7.6.4 Deleting the Stored Procedure

When the `A4QHITACHIPROCSPDATABASES` stored procedure becomes unnecessary, execute the `sp_drop.sql` script provided by Agent for Microsoft SQL Server to delete that stored procedure.

To delete the A4QHITACHIPROCSPDATABASES stored procedure:

1. Set up the environment where the `osql` utility of Microsoft SQL Server can be executed.

   The `osql` utility is provided by Microsoft. For details about the settings for the Microsoft SQL Server environment, refer to the documentation of Microsoft SQL Server.

2. Move to the folder in which the `sp_drop.sql` script is stored.

   The location of the storage folder is as follows:

   installation-folder`\agtq\sql`

3. Execute the `sp_drop.sql` script with the Microsoft SQL Server that is to be monitored specified.

   The execution method for the script differs, depending on the type of monitored Microsoft SQL Server instance, and the authentication method used when connecting to Microsoft SQL Server. The following table shows the execution methods in each case.

Table 7.36 When Deleting From a Default Instance

Authentication Method	Execution Method of the sp_drop.sql Script
SQL Server authentication	`osql -S` *host-name* `-U` *user-name* `-P` *password* `-d master -i sp_drop.sql`
Windows authentication	`osql -S` *host-name* `-E -d master -i sp_drop.sql`

Table 7.37 When Deleting From an Instance that Has a Name

Authentication Method	Execution Method of the sp_drop.sql Script
SQL Server authentication	`osql -S` *host-name*`\`*instance-name* `-U` *user-name* `-P` *password* `-d master -i sp_drop.sql`
Windows authentication	`osql -S` *host-name*`\`*instance-name* `-E -d master -i sp_drop.sql`

Notes: The values that you must to specify are the:

- *host-name*: The name of a host where the monitored Microsoft SQL Server is running
- *instance-name*: The instance name of the monitored Microsoft SQL Server
- *user-name*: A user account that has the `sa` privilege or a privilege equal to the `sa` privilege (fixed server role, sysadmin member account)
- *password*: A password corresponding to the user name specified for *user-name*.

7.6.5 Updating an Instance Environment

Updating an instance environment involves checking the instance name (using the `jpcinslist` command), then updating the instance environment (using the `jpcinssetup` command).

To update multiple instance environments, repeat the procedure for each instance environment.

To update an instance environment:

1. Find the instance name by executing the `jpcinslist` command, specifying the service key of the Agent for Microsoft SQL Server running in the instance environment.

   For example, to check the instance name of Agent for Microsoft SQL Server, execute the following command:

   ```
   jpcinslist agtq
   ```

   If the specified instance name is SQL1, the command displays `SQL1`.

2. Check the information of the instance environment to be updated (see Table 7.38 at the end of these instructions).

3. If the Agent for Microsoft SQL Server service is active in the instance environment that is to be updated, stop the service.

4. Execute the `jpcinssetup` command, specifying the service key and instance name of the Agent for Microsoft SQL Server in the instance environment that you wish to update.

   For example, if you are updating the instance environment for the Agent for Microsoft SQL Server with instance name SQL1, execute the following command:

   ```
   jpcinssetup agtq -inst SQL1
   ```

5. If the service is still active in the instance environment that is to be updated when you execute the `jpcinssetup` command, a confirmation message is displayed to enable you to stop the service.

   If you stop the service, update processing resumes; if you do not stop the service, update processing is cancelled.

6. Enter the information shown in Table 7.38 in accordance with the command's instructions to update the instance information.

   The current settings are displayed (except for the value of `SQL_PASSWORD`). To use the displayed value, press the **Enter** key. When all entries are completed, the instance environment is updated.

7. Restart the service in the updated instance environment.

Table 7.38 Whether the Instance Information for Agent for Microsoft SQL Server Can be Updated

Item	Description
Microsoft SQL Server instance name	This value cannot be updated. The current setting is displayed only.
`SQL_HOST`	This value can be updated. Specify the name of the host on which the Microsoft SQL Server to be monitored is running, by using single-byte characters. The previously specified value is used by default.
`SQL_USER`	This value can be updated. Specify the Microsoft SQL Server user name, by using single-byte characters. The previously specified value is used by default.
`SQL_PASSWORD`	This value can be updated. Specify the password corresponding to the Microsoft SQL Server user name, by using single-byte characters. The previously specified value is used by default.
`SQL_ERRORLOG`	This value can be updated. Specify the full path of the error log file for the monitored Microsoft SQL Server instance, by using single-byte characters. The previously specified value is used by default. You can specify up to 512 single-byte characters. The following characters, spaces, and tabs cannot be specified: `/ : , ; * ? " < > |`
`STARTUP_PENDING`	This value can be updated. Specify the pending time from when Agent for Microsoft SQL Server starts until the normal processing of transfers. The previously specified value is used by default. You can specify a value from 0 to 3600 (unit: seconds). Pending is not performed when `0` is specified.
`LOG_PATH`	This value can be updated. Specify the full path of the output folder for agent logs. The previously specified value is used by default. You can specify up to 245 single-byte characters. The following characters and tabs cannot be specified: `/ : , ; * ? " < > |`
`LOG_SIZE`	This value can be updated. Specify the maximum size of an agent log file. The previously specified value is used by default. Values from 1 to 32 (units: MB) can be specified, but we recommend a value of 16 or greater.

Item	Description
TIMEOUT	This value can be updated. Specify the timeout value for queries to Microsoft SQL Server. Values from 1 to 3600 (units: seconds) can be specified. The previously specified value is used by default.
LOGIN_TIMEOUT	This value can be updated. Specify the timeout value for connecting to Microsoft SQL Server. Values from 1 to 3600 (units: seconds) can be specified. The previously specified value is used by default.

7.6.6 Setting up Agent for Microsoft SQL Server in a Cluster System

This section describes setup for using Agent for Microsoft SQL Server in a cluster system. Setup procedures differ for an executing node and standby node. Perform setup for the executing node first, and then for the standby node.

Note: If you set up an Agent in a logical host environment, the settings of the Agent in the physical host environment will not be inherited. For both logical and physical host environments, the instance environment is newly created when the instance environment is set.

7.6.6.1 Setting up the Executing Node's Logical Host Environment

Set up a logical host environment for Agent for Microsoft SQL Server in the executing node. The procedure is as follows:

Note: Before performing setup, terminate all the services of Collection Manager and the Agent in the entire Tuning Manager system.

1. Mount the shared disk.

   Make sure that the shared disk is mounted. If it is not, use cluster software or a volume manager to mount it.

2. Set up a logical host environment for Agent for Microsoft SQL Server.

   Execute the `jpchasetup create` command to create a logical host environment.

   This command copies required data to the shared disk, sets definitions for a logical host, and creates a logical host environment.

   To create a logical host environment:

   a) Execute the `jpchasetup create` command to create a logical host environment for Agent for Microsoft SQL Server, as shown in the following example:

      ```
      jpchasetup create agtq -lhost tm1-ha1SQL -d S:\tm1
      ```

      Use the `-lhost` option to specify the logical host name. In this example, `tm1-ha1SQL` is specified as the logical host name. If DNS is used, specify the logical host name without the domain name.

      Specify the directory name of the shared disk as the environment directory name in the `-d` option. For example, if you specify `-d S:\tm1` on a Windows host, then `S:\tm1\jp1pc` will be created and a file for the logical host environment will be created.

b) Execute the `jpchasetup list` command to check that the setting of the created logical host environment is correct, as shown in the following example:

```
jpchasetup list all
```

3. Set the connection-target Tuning Manager.

   Execute the `jpcnshostname` command to specify the Tuning Manager that will manage Agent for Microsoft SQL Server, as shown in the following example:

   ```
   jpcnshostname -s tm1-ha1 -lhost tm1-ha1SQL
   ```

   Use the `-s` option to specify the host name of connection-target Tuning Manager. When the connection-target Tuning Manager is running on a logical host, specify the logical host name of the connection-target Tuning Manager by using the `-s` option. In this example, the host name of Tuning Manager is specified as `tm1-ha1`.

   Also, use the `-lhost` option to specify the logical host name of Agent for Microsoft SQL Server. In this example, the logical host name of Agent for Microsoft SQL Server is specified as `tm1-ha1SQL`.

4. Set up an instance environment.

   a) Execute the `jpcinssetup` command to set up an instance environment for Agent for Microsoft SQL Server, as shown in the following example:

      ```
      jpcinssetup agtq -lhost tm1-ha1SQL -inst SQL1
      ```

      Use the `-lhost` option to specify the logical host name. In this example, the logical host name of Agent for Microsoft SQL Server is specified as `tm1-ha1SQL`, and the instance name is `SQL1`.

   b) Set up an instance environment.

      An instance environment is set up in the same way as for a non-cluster system. For details on what is to be set up, see section 7.6.1.

      For details on setting the pending time for when failover occurs, see section 7.6.8.

5. Register the stored procedure.

   Register the stored procedure that is used when Agent for Microsoft SQL Server obtains a list of names and sizes of the database from Microsoft SQL Server.

   The procedure for registering the stored procedure is the same as for a non-cluster system. For details, see section 7.6.2.

6. Set up logical host environments for Collection Manager and other Agents.

   If you set up Collection Manager and any Agents other than Agent for Microsoft SQL Server on the same logical host, set up logical host environments for them now.

   For details about the setup procedure for Collection Manager, see section 3.3.1. For details about the setup procedure for each Agent, see the section in this chapter that describes the setup procedure for your Agent.

7. Set a port number.

   You need to perform this setup only when Tuning Manager series programs are used in a network environment with a firewall. If communications among the Tuning Manager series programs are via a firewall, specify a port number by using the `jpcnsconfig port` command.

   For details about setting port numbers, see section 6.4. For details about the list of the port numbers, see the *HiCommand Tuning Manager Agent Administration Guide*.

8. Set an IP address.

   You can specify an IP address when using Tuning Manager series programs in a network environment with more than one LAN connected. To specify an IP address, edit the `jpchosts` file directly.

   For details on setting an IP address, see section 6.5.

   Note: After editing the `jpchosts` file, copy it from the executing node to the standby node.

9. Export the definitions of the logical host environment.

   After creating a logical host environment for Agent for Microsoft SQL Server, export the environment definitions to a file. All the definitions of the Collection Manager and Agents that are set up on the logical host will be output to the file. If you set up Collection Manager and any Agents other than Agent for Microsoft SQL Server on the same logical host, export the definitions after you finish the setup.

   To export the definitions of the logical host environment, execute the `jpchasetup export` command. This command will output, to an export file, the definitions of the logical host environment that has been created. The export file may have any name. For example, to export the definitions of the logical host environment to the `lhostexp.txt` file, execute the following command:

   ```
   jpchasetup export -f lhostexp.txt
   ```

10. Copy the exported file to the standby node.

    Copy the file that you exported at step 9 from the executing node to the standby node.

11. Unmount the shared disk.

    End operations by unmounting the shared disk on the Windows host. To unmount the shared disk on the Windows host, use cluster software or a volume manager. If you want to continue to use the shared disk, you do not have to unmount the shared disk.

7.6.6.2 Setting up the Standby Node's Logical Host Environment

Set up a logical host environment for Agent for Microsoft SQL Server in the standby node. To set up the logical host environment, import, to the standby node, the definitions of the logical host environment that were exported at the executing node.

To import the definitions of the logical host environment for Agent for Microsoft SQL Server, use the `jpchasetup import` command. If more than one Collection Manager or Agent has been set up on a single logical host, all the definitions are imported at the same time.

You do not have to mount the shared disk to execute this command.

To set up the logical host environment for the standby node:

1. Execute the `jpchasetup import` command to import the definitions of the logical host environment, as shown in the following example:

   ```
   jpchasetup import -f lhostexp.txt
   ```

   This command will change the environment settings for the standby node to those in the export file. This will set up the environment for starting the Collection Manager and Agents on the logical host.

   The fixed port number specified by the `jpcnsconfig port` command during setup for the executing node will also be imported.

2. Execute the `jpchasetup list` command to check that the setting of the logical host environment is the same as that for the executing node, as shown in the following example:

   ```
   jpchasetup list all
   ```

Note: After editing the `jpchosts` file, copy it from the executing node to the standby node.

7.6.6.3 Registering Agent for Microsoft SQL Server in the Cluster Software

To use an Agent in a logical host environment, register it in the cluster software. This registration sets up the environment so that the Agent can be started or terminated via control from the cluster software.

The example below describes the settings specified when Agent for Microsoft SQL Server is registered in the cluster software on a windows host. This example uses Windows 2000 MSCS as cluster software. For Agent for Microsoft SQL Server, you need to register the following services in the cluster software.

Table 7.39 Agent for Microsoft SQL Server Services to Be Registered in Cluster Software

Displayed Name	Service Name	Dependency
PFM - Agent Store for Microsoft(R) SQL Server *instance-name* [*lhost*]	JP1PCAGT_QS_*instance-name* [*lhost*]	IP address resource Physical disk resource
PFM - Agent for Microsoft(R) SQL Server *instance-name* [*lhost*]	JP1PCAGT_QA_*instance-name* [*lhost*]	Cluster resource for PFM – Agent Store for Microsoft(R) SQL Server *instance-name* [*lhost*]
PFM - Action Handler [*lhost*]	JP1PCMGR_PH [*lhost*]	IP address resource Physical disk resource

Note: Replace *lhost* by a logical host name. For example, if the instance name is `SQL1` and the logical host name is `tm1-ha1SQL`, the displayed name of the service will be `PFM - Agent Store for Microsoft(R) SQL Server SQL1 [tm1-ha1SQL]`, and the service name will be `JP1PCAGT_QS_SQL1 [tm1-ha1]`.

The above services are registered as resources of MSCS. Set the resources as described below. The bold text below indicates items to be set for MSCS.

- Set **Type of resource** to **Generic service**.
- Set **Name**, **Service name** and **Dependency** as shown in Table 7.39.

  Note that a name in the *Displayed name* column is the name of a service, and a name in the *Service name* column is used to specify a service to be controlled from MSCS.
- Do not set **Startup parameter** and **Registry replication**.
- Set the **Details** page of the properties according to whether you want the system to fail over when a failure occurs with the Agent.

  Normally you specify settings so that no failover occurs. If you want the system to fail over, set this page as follows:
  - **Restart**: Select this item.
  - **Apply to a group**: Do not select this item.
  - **Threshold** for the number of restart retries: `3` (the recommended value)

Notes:

- The cluster software controls the starting and stopping of the services to be registered. Thus, set **Type of startup** to **Manual** so that the services will not start automatically when the OS starts up. The type of startup for a service is set to **Manual** immediately after the service is set up by the `jpchasetup create` command.
- When registering PFM - Agent Store for Microsoft SQL Server and PFM - Agent for Microsoft SQL Server (both of which are Agent for Microsoft SQL Server services) with the cluster software, do not set any dependencies to Microsoft SQL Server, because doing so will delay failover.

7.6.6.4 Checking Starting and Stopping

To check normal operation, use the cluster software to start and stop Agent for Microsoft SQL Server at each node.

7.6.7 Canceling Setup in a Cluster System

This section describes how to cancel setup of Agent for Microsoft SQL Server in a cluster system. Procedures for canceling setup differ for an executing node and standby node. Cancel the setup of Agent for Microsoft SQL Server first for the executing node and then for the standby node.

Note: Before canceling setup, stop all the services of Collection Manager and the Agents that are running on the executing and standby nodes whose setup is to be canceled.

7.6.7.1 Canceling Setup of the Executing Node's Logical Host Environment

In the executing node, cancel setup of the logical host environment of Agent for Microsoft SQL Server. The procedure is as follows:

1. Mount the shared disk.

   Make sure that the shared disk is mounted. If it is not, use cluster software or a volume manager to mount it.

2. Cancel setup of a port number.

   This procedure is required only when a port number was specified by the `jpcnsconfig port` command during setup in an environment with a firewall.

   To cancel setup of a port number, set "`0`" as the port number. For details about setting port numbers, see section 6.4.

3. Cancel setup of Agent for Microsoft SQL Server in a logical host environment.

   Execute the `jpchasetup delete` command to delete the logical host environment, as shown in the following example. In this example, the logical host name of Agent for Microsoft SQL Server is specified as `tm1-ha1SQL` and the instance name as `SQL1`.

   Note: If you delete a logical host environment while the shared disk is not mounted, only the setting of the logical host on the physical host will be deleted and the directories and files on the shared disk will not be deleted. In such a case, you must mount the shared disk and manually delete the `jp1pc` directory under the environment directory.

   To delete the logical host environment:

   a) Execute the `jpchasetup list` command to check the settings of the logical host environment to be deleted, such as the logical host name and the path to the shared disk, as shown in the following example:

      ```
      jpchasetup list all -lhost tm1-ha1SQL
      ```

   b) Execute the `jpcinsunsetup` command to delete the instance environment of Agent for Microsoft SQL Server, as shown in the following example:

```
jpcinsunsetup agtq -lhost tm1-ha1SQL -inst SQL1
```

When you execute the `jpcinsunsetup` command, the setting to start up the instances on the logical host will be deleted. At the same time, the files for the instances will be deleted from the shared disk.

c) Execute the `jpchasetup delete` command to delete the logical host environment of Agent for Microsoft SQL Server, as shown in the following example:

```
jpchasetup delete agtq -lhost tm1-ha1SQL
```

When you execute the `jpchasetup delete` command, the setting to start up Agent for Microsoft SQL Server on the logical host will be deleted. At the same time, the file for the logical host will be deleted from the shared disk.

d) Execute the `jpchasetup list` command to check that Agent for Microsoft SQL Server has been deleted from the logical host environment, as shown in the following example:

```
jpchasetup list all
```

4. Cancel setup of the logical host environments for Collection Manager and other Agents.

   If you cancel setup of Collection Manager and any Agents other than Agent for Microsoft SQL Server from the same logical host, cancel setup of the logical host environments for them now.

   For details about the procedure for canceling setup of Collection Manager, see section 8.1.3. For details about the procedure for canceling setup of each Agent, see the section in this chapter that describes the procedure for your Agent.

5. Export the definitions of the logical host environment.

   After deleting the logical host environment for Agent for Microsoft SQL Server, export the environment definitions to a file.

   To export the definitions of the logical host environment, use the `jpchasetup export` command. This command will output the definitions of the logical host environments for Collection Manager and the Agents to an export file. The export file may have any name. For example, to export the definitions of the logical host environment to the `lhostexp.txt` file, execute the following command:

   ```
   jpchasetup export -f lhostexp.txt
   ```

   Collection Manager and the Agents make the environment of the executing node match that of the standby node by exporting and importing the environment definitions.

   If you import to the standby node the environment definitions exported at the executing node (where environment definitions of Collection Manager and the Agents were deleted), they will be compared with the existing environment definitions of the standby node (where the definitions of Collection Manager and the Agents remain without being deleted). Then, differences (that is, the environment definitions of Collection Manager and the Agents that were deleted at the executing node) will be deleted from the standby node.

6. Copy the exported file to the standby node.

   Copy the logical host environment definition file that you exported at step 5 from the executing node to the standby node.

7. Unmount a shared disk.

   End operations by unmounting the shared disk on the Windows host. To unmount the shared disk on the Windows host, use cluster software or a volume manager. If you want to continue to use the shared disk, you do not have to unmount the shared disk.

7.6.7.2 Canceling Setup of the Standby Node's Logical Host Environment

Cancel setup of the logical host environment for Agent for Microsoft SQL Server at the standby node. To cancel setup, copy the definitions of the logical host environment exported at the executing node to the standby node.

You do not have to unmount the shared disk to cancel setup at the standby node.

To cancel setup of the logical host environment at the standby node:

1. Execute the `jpchasetup import` command to import the definitions of the logical host environment, as shown in the following example:

   ```
   jpchasetup import -f lhostexp.txt
   ```

   This command will change the environment settings for the standby node to those in the export file. This means the setting to start Agent for Microsoft SQL Server of the logical host will be deleted. If setup is canceled for the Collection Manager and Agents on other logical hosts, those settings will also be deleted.

   The setup for the fixed port number specified by the `jpcnsconfig port` command during setup will also be canceled.

2. Execute the `jpchasetup list` command to check that the setting of the logical host environment is the same as that for the executing node, as shown in the following example:

   ```
   jpchasetup list all
   ```

7.6.7.3 Unregistering the Cluster Software

Delete, from the cluster software, the settings related to Agent for Microsoft SQL Server on a logical host. For details on the deletion procedure, refer to the documentation for the cluster software.

7.6.7.4 Deleting Settings at Tuning Manager

Delete the definitions related to Agent for Microsoft SQL Server whose setup is to be canceled.

To delete the definitions:

1. Delete the Tuning Manager's Agent information.

   For example, if Tuning Manager is running on the logical host `tm1-ha1`, and Agent for Microsoft SQL Server is running on the logical host `tm1-ha1SQL`, execute the following command in Tuning Manager:

   `jpcctrl delete` *service-ID* `host=tm1-ha1SQL lhost=tm1-ha1`

   In *service-ID*, specify the service ID of the Agent to be deleted.

2. Restart the Collection Manager services.
3. Restart Performance Reporter.

7.6.8 Pending Function During Failover

The pending function delays for a fixed time processing to connect to Microsoft SQL Server after Agent for Microsoft SQL Server starts. When this function is used and failover occurs, Agent for Microsoft SQL Server can connect to Microsoft SQL Server once transaction recovery processing is completed on the standby node. This can prevent delays in connecting to Agent for Microsoft SQL Server databases caused by waiting for Microsoft SQL Server recovery processing.

Figure 7.1 shows the processing flow when the pending function is used.

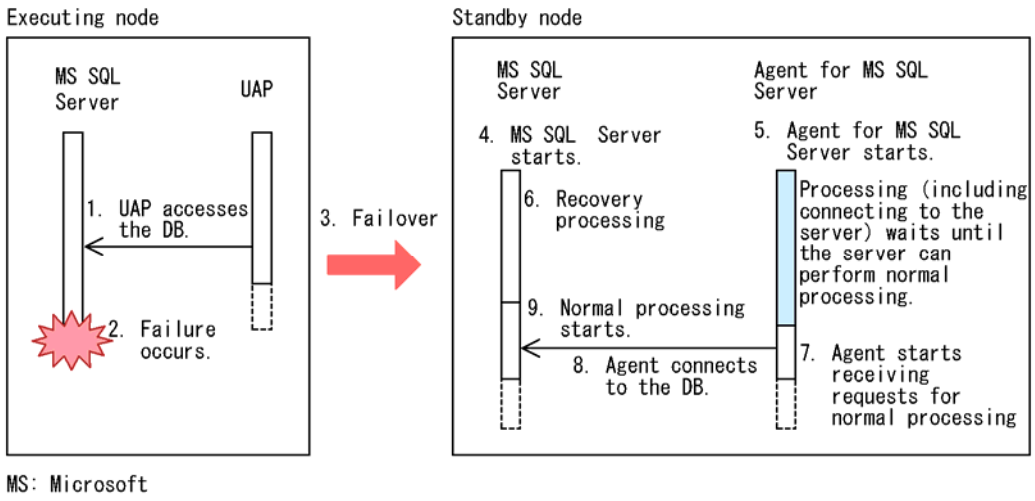


Figure 7.1 Processing Flow When the Pending Function Is Used

Setting the pending time

The pending time is specified when the `jpcinssetup` command is used to perform instance environment settings. It can be set to a value from 0 to 3600 (units: seconds). If 0 is specified, pending is not performed. Values outside the valid range are ignored.

Note that when failover occurs, the time needed for recovery processing on Microsoft SQL Server differs depending on the machine configuration and the processing contents of the application accessing Microsoft SQL Server. Set a pending time longer than the time needed in the actual operating environment.

For information on using the `jpcinssetup` command to set the pending time, see section 7.6.1.

Precautions regarding use of the pending function

- When using the `jpcctrl list` command during pending to check the status, do not set the status management function to `disable`, because the `jpcctrl list` command will block until pending is complete, and not return the status.
- For a cluster configuration, use the cluster software to check the status of a pending Agent for Microsoft SQL Server. For details on how to check the status, refer to the cluster software documentation.
- During pending, terminate Agent for Microsoft SQL Server from the cluster software in a cluster configuration, or from the Windows **Start** menu, **Administrative Tools**, and then **Services** in a non-cluster configuration. Note that regardless of whether a cluster configuration is used, executing the `jpcstop` command for a pending Agent for Microsoft SQL Server will result in an error.

7.7 Setting up Agent for DB2

This section explains the setup that is required before you can use Agent for DB2.

7.7.1 Setting up an Instance Environment

You must specify instance information for the DB2 that Agent for DB2 will monitor. Table 7.40 lists the instance information items that are to be specified. Check this information before you start the setup procedure. For details about DB2 instance information, refer to the DB2 documentation.

Table 7.40 Instance Information for Agent for DB2

Item	Description
db2_instance	Specify the instance name for DB2. Up to 8 single-byte alphanumeric characters can be specified. However, space characters and the following symbols cannot be used: ! " % & ' ( ) + , - . / : ; < = > ? [\ ] ' { | } ~
db2_node	Specify the node name for DB2. Up to 8 single-byte alphanumeric characters can be specified. However, space characters and the following symbols cannot be used: ! " % & ' ( ) + , - . / : ; < = > ? [\ ] ' { | } ~
db2_name	Specify the database name for DB2. Up to 8 single-byte alphanumeric characters can be specified. However, space characters and the following symbols cannot be used: ! " % & ' ( ) + , - . / : ; < = > ? [\ ] ' { | } ~
db2_user	Specify a user name that has SYSADM, SYSCTRL or SYSMAINT privileges and is allowed to connect to the DB2 database. Up to 8 single-byte alphanumeric characters can be specified. However, space characters and the following symbols cannot be used: ! " % & ' ( ) + , - . / : ; < = > ? [\ ] ' { | } ~
db2_password	Specify the password for the user specified by db2_user. Up to 64 single-byte alphanumeric characters can be specified. However, space characters and the following symbols cannot be used: ! " % & ' ( ) + , - . / : ; < = > ? [\ ] ' { | } ~
attach_retry	Specify the number of DB2 instance connection retries. The default is 0. A value from 0 to 99 (the number of retries) can be specified.
attach_waittime	Specify the interval for DB2 instance connection retries. The default is 0. A value from 0 to 600 (seconds) can be specified.

Notes:

- If the information for db2_instance or db2_node is unknown, start Control Center for the DB2 and specify *Name* in the Instances folder for db2_instance, and *Node name* for db2_node. For details about Control Center, refer to the DB2 manual.

- To acquire performance data from DB2, Agent for DB2 sets the snapshot monitor switches listed below to ON for the DB2 instance being monitored. To enable Agent for DB2 to set the snapshot monitor switches to on, you first need to specify a user name that has the SYSADM privilege for `db2_user` in the instance information. Note that, for Agent for DB2 5.1.0-01 or later versions, if all of these snapshot monitor switches are already on, you can specify a user name that has the SYSCTRL or SYSMAINT privilege for `db2_user` in the instance information (for details about the snapshot monitor switch, refer to the DB2 manual):
  - DFT_MON_BUFPOOL
  - DFT_MON_LOCK
  - DFT_MON_SORT
  - DFT_MON_STMT
  - DFT_MON_TABLE
  - DFT_MON_UOW
- Agent for DB2 services will not start unless the instance environment is set up.

Use the `jpcinssetup` command to construct an instance environment.

To construct an instance environment:

1. Execute the `jpcinssetup` command with the service key and instance name (no more than 32 bytes) specified.

   For example, to construct an instance environment for the instance named db2inst for Agent for DB2, execute the following command:

   ```
   jpcinssetup agtr -inst db2inst
   ```

   Note: Use an instance name that is unique among all the names of the Agent instances on the network.

2. Set up the instance information for the DB2 you will monitor.

   Enter the information shown in Table 7.40, in accordance with the command's instructions. To use the displayed default value, press the **Enter** key.

3. To perform the operation with multiple instances, repeat steps 1 and 2 for each instance.

7.7.1.1 About the Constructed Instance Environment

Once you have entered all items, the instance environment is constructed. Described below are the organization of directories for instance environments and the service ID for an instance environment.

Organization of Directories for Instance Environments

Instance environments are constructed under the following directory:

`/opt/jp1pc/agtr`

Table 7.41 shows the organization of the directories for instance environments.

Table 7.41 Organization of Directories for Instance Environments (Agent for DB2)

Directory and File Names			Description
`agent`	*instance-name*	`jpcagt.ini`	Startup-information file of the Agent Collector service
		`jpcagt.ini.model` See *Note*	Model file for the startup-information file of the Agent Collector service
		`log`	Directory for storing internal log files of the Agent Collector service
`store`	*instance-name*	`*.DAT`	Data model definition file
		`backup`	Default directory for backing up the database
		`dump`	Default directory for exporting the database
		`jpcsto.ini`	Startup-information file of the Agent Store service
		`jpcsto.ini.model` See *Note*	Model file for the startup-information file of the Agent Store service
		`log`	Directory for storing internal log files of the Agent Store service

Note: Use this file to restore the settings that were in effect before the instance environment was constructed.

Service ID for an Instance Environment

The following is the service ID for an instance environment:

product-ID function-ID instance-number instance-name [*host-name*]

The *instance-name* is specified with the `jpcinssetup` command. For details about service IDs, see the *HiCommand Tuning Manager Agent Administration Guide*.

7.7.2 Canceling Setup of an Instance Environment

This section describes canceling setup of an instance environment. To cancel setup of multiple instance environments, you must repeat the following procedures for each environment:

- Delete the Agent's instance environment on the Agent host
- Delete the Agent's instance information on the Tuning Manager host

To delete the Agent's instance environment on the Agent host:

1. Find the instance name of Agent for DB2 using the `jpcinslist` command. The command format is as follows:

   `jpcinslist agtr`

   For example, if the instance name is db2inst, the command displays `db2inst`.

2. Stop the Agent for DB2 service in the instance environment if it is active.
3. Delete the instance environment using the `jpcinsunsetup` command. The command format is as follows:

   `jpcinsunsetup agtr -inst` *instance-name*

   ***Example*:**

   To delete an instance environment whose instance name is db2inst:

   `jpcinsunsetup agtr -inst db2inst`

   If the command is successful, the directories created during instance environment setup are deleted. If a service with the specified instance name is active, a message appears asking whether the service is to be stopped.

To delete the Agent's instance information on the Tuning Manager host:

1. On the Tuning Manager host, execute the `jpcctrl delete` command to delete the Agent's instance information.

   For example, to delete the instance information when the instance name is db2inst, the host name is host03, the Agent Collector service ID is RA1db2inst[host03], and the Agent Store service ID is RS1db2inst[host03]:

   `jpcctrl delete "R?1db2inst[host03]" host=host03`

2. Restart the Collection Manager service.
3. Restart Performance Reporter.

7.7.3 Updating an Instance Environment

Updating an instance environment involves checking the instance name (using the `jpcinslist` command), then updating the instance environment (using the `jpcinssetup` command).

To update multiple instance environments, repeat the following procedure for each instance environment.

To update an instance environment:

1. Find the instance name by executing the `jpcinslist` command, specifying the service key of the Agent for DB2 running in the instance environment.

   For example, to check the instance name of Agent for DB2, execute the following command:

   ```
   jpcinslist agtr
   ```

   If the specified instance name is db2inst, the command displays `db2inst`.

2. Check the information of the instance environment to be updated (see Table 7.42 at the end of these instructions).

3. If the Agent for DB2 service is active in the instance environment that is to be updated, stop the service.

4. Execute the `jpcinssetup` command, specifying the service key and instance name of the Agent for DB2 in the instance environment that you wish to update.

   For example, if you are updating the instance environment for the Agent for DB2 with instance name db2inst, execute the following command:

   ```
   jpcinssetup agtr -inst db2inst
   ```

5. If the service is still active in the instance environment that is to be updated when you execute the `jpcinssetup` command, a confirmation message is displayed to enable you to stop the service.

   If you stop the service, update processing resumes; if you do not stop the service, update processing is cancelled.

6. Enter the information shown in Table 7.42 in accordance with the command's instructions to update the instance information.

   The current settings are displayed (except for the db2_password). To use the displayed value, press the **Enter** key. When all entries are completed, the instance environment is updated.

7. Restart the service in the updated instance environment.

Table 7.42 Instance Information that can be Updated for Agent for DB2

Item	Description
db2_instance	The value of this item can be updated. Specify the instance name for DB2. Up to 8 single-byte alphanumeric characters can be specified. However, space characters and the following symbols cannot be used: ! " % & ' ( ) + , - . / : ; < = > ? [\ ] ' { | } ~
db2_node	The value of this item can be updated. Specify the node name for DB2. Up to 8 single-byte alphanumeric characters can be specified. However, space characters and the following symbols cannot be used: ! " % & ' ( ) + , - . / : ; < = > ? [\ ] ' { | } ~
db2_name	The value of this item can be updated. Specify the database name for DB2. Up to 8 single-byte alphanumeric characters can be specified. However, space characters and the following symbols cannot be used: ! " % & ' ( ) + , - . / : ; < = > ? [\ ] ' { | } ~
db2_user	The value of this item can be updated. Specify a user name that has SYSADM, SYSCTRL or SYSMAINT privileges and is allowed to connect to the DB2 database. Up to 8 single-byte alphanumeric characters can be specified. However, space characters and the following symbols cannot be used: ! " % & ' ( ) + , - . / : ; < = > ? [\ ] ' { | } ~
db2_password	The value of this item can be updated. Specify the password for the user specified by db2_user. Up to 64 single-byte alphanumeric characters can be specified. However, space characters and the following symbols cannot be used: ! " % & ' ( ) + , - . / : ; < = > ? [\ ] ' { | } ~
attach_retry	The value of this item can be updated. Specify the number of DB2 instance connection retries. The default is 0. A value from 0 to 99 (the number of retries) can be specified.
attach_waittime	The value of this item can be updated. Specify the interval for DB2 instance connection retries. The default is 0. A value from 0 to 600 (seconds) can be specified.

7.7.4 Setting up Agent for DB2 in a Cluster System

This section describes setup for using Agent for DB2 in a cluster system. Setup procedures differ for an executing node and standby node. Perform setup for the executing node first, and then for the standby node.

Note: If you set up an Agent in a logical host environment, the settings of the Agent in the physical host environment will not be inherited. For both logical and physical host environments, the instance environment is newly created when the instance environment is set.

7.7.4.1 Setting up the Executing Node's Logical Host Environment

Set up a logical host environment for Agent for DB2 in the executing node. The procedure is as follows:

Note: Before performing setup, terminate all the services of Collection Manager and the Agent in the entire Tuning Manager system.

1. Mount the shared disk.

   Make sure that the shared disk is mounted. If it is not, use cluster software or a volume manager to mount it.

2. Set up a logical host environment for Agent for DB2.

   Execute the `jpchasetup create` command to create a logical host environment.

   This command copies required data to the shared disk, sets definitions for a logical host, and creates a logical host environment.

   To create a logical host environment:

   a) Execute the `jpchasetup create` command to create a logical host environment for Agent for DB2, as shown in the following example:

      ```
      jpchasetup create agtr -lhost tm1-ha1db2 -d /tm1
      ```

      Use the `-lhost` option to specify the logical host name. In this example, `tm1-ha1db2` is specified as the logical host name. If DNS is used, specify the logical host name without the domain name.

      Specify the directory name of the shared disk as the environment directory name in the `-d` option. For example, if you specify `-d /tm1`, then `/tm1/jp1pc` will be created and a file for a logical host environment will be created.

   b) Execute the `jpchasetup list` command to check that the setting of the created logical host environment is correct, as shown in the following example:

      ```
      jpchasetup list all
      ```

3. Set the connection-target Tuning Manager.

   Execute the `jpcnshostname` command to specify the Tuning Manager that will manage Agent for DB2, as shown in the following example:

   ```
   jpcnshostname -s tm1-ha1 -lhost tm1-ha1db2
   ```

   Use the `-s` option to specify the host name of connection-target Tuning Manager. When the connection-target Tuning Manager is running on a logical host, specify the logical host name of the connection-target Tuning Manager by using the `-s` option. In this example, the host name of Tuning Manager is specified as `tm1-ha1`.

   Also, use the `-lhost` option to specify the logical host name of Agent for DB2. In this example, the logical host name of Agent for DB2 is specified as `tm1-ha1db2`.

4. Set up an instance environment.

   a) Execute the `jpcinssetup` command to set up an instance environment for Agent for DB2, as shown in the following example:

      ```
      jpcinssetup agtr -lhost tm1-ha1db2 -inst db2inst
      ```

Use the `-lhost` option to specify the logical host name. In this example, the logical host name of Agent for DB2 is specified as `tm1-ha1db2`, and the instance name is `db2inst`.

b) Set up an instance environment.

An instance environment is set up in the same way as for a non-cluster system. For details on what is to be set up, see section 7.7.1.

5. Set up logical host environments for Collection Manager and other Agents.

If you set up Collection Manager and any Agents other than Agent for DB2 on the same logical host, set up logical host environments for them now.

For details about the setup procedure for Collection Manager, see section 3.3.1. For details about the setup procedure for each Agent, see the section in this chapter that describes the setup procedure for your Agent.

6. Set a port number.

You need to perform this setup only when Tuning Manager series programs are used in a network environment with a firewall. If communications among the Tuning Manager series programs are via a firewall, specify a port number by using the `jpcnsconfig port` command.

For details about setting port numbers, see section 6.4. For details about the list of the port numbers, see the *HiCommand Tuning Manager Agent Administration Guide*.

7. Set an IP address.

You can specify an IP address when using Tuning Manager series programs in a network environment with more than one LAN connected. To specify an IP address, edit the `jpchosts` file directly.

For details on setting an IP address, see section 6.5.

Note: After editing the `jpchosts` file, copy it from the executing node to the standby node.

8. Export the definitions of the logical host environment.

After creating a logical host environment for Agent for DB2, export the environment definitions to a file. All the definitions of the Collection Manager and Agents that are set up on the logical host will be output to the file. If you set up Collection Manager and any Agents other than Agent for DB2 on the same logical host, export the definitions after you finish the setup.

To export the definitions of the logical host environment, execute the `jpchasetup export` command. This command will output, to an export file, the definitions of the logical host environment that has been created. The export file may have any name. For example, to export the definitions of the logical host environment to the `lhostexp.txt` file, execute the following command:

```
jpchasetup export -f lhostexp.txt
```

9. Copy the exported file to the standby node.

Copy the file that you exported at step 8 from the executing node to the standby node.

10. Unmount the shared disk.

    End operations by unmounting the file system on the UNIX host. If you want to continue to use the shared disk, you do not have to unmount the file system.

    Note specific to UNIX hosts: If there is a `jp1pc` directory in the specified environment directory, and there are files under the `jp1pc` directory despite the shared disk being unmounted, setup was performed while the shared disk was not mounted. In such a case, perform the following procedure to resolve the problem:

    a) Use the `tar` command to archive the `jp1pc` directory in the specified environment directory on the local disk.

    b) Mount the shared disk.

    c) If the specified environment directory does not exist on the shared disk, create the environment directory.

    d) From the `tar` file created at (a), extract the archived directory into the environment directory on the shared disk.

    e) Unmount the shared disk.

    f) Delete the `jp1pc` directory and its subordinates from the specified directory on the local disk.

7.7.4.2 Setting up the Standby Node's Logical Host Environment

Set up a logical host environment for Agent for DB2 in the standby node. To set up the logical host environment, import, to the standby node, the definitions of the logical host environment that were exported at the executing node.

To import the definitions of the logical host environment for Agent for DB2, use the `jpchasetup import` command. If more than one Collection Manager or Agent has been set up on a single logical host, all the definitions are imported at the same time.

You do not have to mount the shared disk to execute this command.

To set up the logical host environment for the standby node:

1. Execute the `jpchasetup import` command to import the definitions of the logical host environment, as shown in the following example:

   ```
   jpchasetup import -f lhostexp.txt
   ```

   This command will change the environment settings for the standby node to those in the export file, and it will set up the environment for starting the Collection Manager and Agents on the logical host. The fixed port number specified by the `jpcnsconfig port` command during setup for the executing node will also be imported.

2. Execute the `jpchasetup list` command to check that the setting of the logical host environment is the same as that for the executing node, as shown in the following example: `jpchasetup list all`

Note: After editing the `jpchosts` file, copy it from the executing node to the standby node.

7.7.4.3 Registering Agent for DB2 in the Cluster Software

To use an Agent in a logical host environment, register it in the cluster software. This registration sets up the environment so that the Agent can be started or terminated via control from the cluster software.

This section describes the settings specified when Agent for DB2 is registered in the cluster software on a UNIX host. There are four items required for registering an application in the UNIX cluster software: Startup, Stop, Monitoring and Forced stop.

The following table shows how to control Agent for DB2 to be registered in the cluster software.

Table 7.43 Control Method for Agent for DB2 Registered in Cluster Software

Item	Description
Startup	Execute the following commands in the following order to start the Agent for DB2: `/opt/jp1pc/tools/jpcstart act lhost=`*logical-host-name* `/opt/jp1pc/tools/jpcstart agtr lhost=`*logical-host-name* `inst=`*instance-name* Start the Agent after the shared disk and the logical IP address become available.
Stop	Execute the following commands in the following order to stop the Agent for DB2: `/opt/jp1pc/tools/jpcstop agtr lhost=`*logical-host-name* `inst=`*instance-name* `/opt/jp1pc/tools/jpcstop act lhost=`*logical-host-name* Stop the Agent before the shared disk and the logical IP address are made unavailable. If services are stopped because of a failure, the return value of the `jpcstop` command is 3. Consider such a case as a normal end because the services are inactive. If the cluster software uses the return value to determine the execution result, make the return value 0.

Monitoring	Use the `ps` command to check that the processes below are running:
	`ps -ef | grep "`*process-name logical-host-name*`" | grep -v "grep `*process-to-be-monitored*`"`
	The following processes are to be monitored:
	`jpcagtr`, `agtr/jpcsto`, and `jpcah`
	For details about process names, see the *HiCommand Tuning Manager Agent Administration Guide*.
	In some situations, Agents need to be temporarily stopped. For such situations, provide a method for suppressing monitoring (such as not monitoring files while they are undergoing maintenance).

Forced stop	If forced stop is required, use the following command: `/opt/jp1pc/tools/jpcstop all lhost=`*logical-host-name* `kill=immediate` You can specify only `all` as a service key in the first argument. *Note*: By sending SIGKILL, this command performs a forced stop of all the processes of the Collection Manager and Agents running in the specified logical host environment. At this time, the Collection Manager and Agents are stopped not on the service level but on the logical host level. Forced stop must be set up only for the cases in which execution of an ordinary stop cannot stop the system.

Notes:

- The cluster software controls the starting and stopping of the Agent to be registered. Do not set up the Agent to start automatically when the OS starts.

- If the cluster software uses the return value of the `jpcstart` command or the `jpcstop` command to evaluate the execution result, specify the settings so that the return value of these commands is converted to the value expected by the cluster software. For details on the return values of the `jpcstart` command and the `jpcstop` command, see the *HiCommand Tuning Manager Command Line Interface Guide*.
- The length of characters to be displayed by the `ps` command varies with the OS. The length must be 47 or fewer characters when a logical host name and an instance name are added together. When you use the `ps` command for monitoring, make sure all the logical hosts are displayed by the `ps` command beforehand. If not all the characters are displayed, specify settings so that only the displayed characters are monitored.

7.7.4.4 Checking Starting and Stopping

To check normal operation, use the cluster software to start and stop Agent for DB2 at each node.

7.7.5 Canceling Setup in a Cluster System

This section describes how to cancel setup of Agent for DB2 in a cluster system. Procedures for canceling setup differ for an executing node and standby node. Cancel the setup of Agent for DB2 first for the executing node and then for the standby node.

Note: Before canceling setup, stop all the services of Collection Manager and the Agents that are running on the executing and standby nodes whose setup is to be canceled.

7.7.5.1 Canceling Setup of the Executing Node's Logical Host Environment

In the executing node, cancel setup of the logical host environment of Agent for DB2. The procedure is as follows:

1. Mount the shared disk.

   Make sure that the shared disk is mounted. If it is not, use cluster software or a volume manager to mount it.

   Note specific to UNIX hosts: If there is a `jp1pc` directory in the specified environment directory, and there are files under the `jp1pc` directory despite the shared disk being unmounted, setup was performed while the shared disk was not mounted. In such a case, carry out the following procedure to resolve the problem:

   a) Use the `tar` command to archive the `jp1pc` directory in the environment directory of the logical host for which you want to cancel setup on the local disk.

   b) Mount the shared disk.

   c) If the environment directory of the logical host for which you want to cancel setup does not exist on the shared disk, create the environment directory.

   d) Expand the `tar` file in the environment directory of the logical host on the shared disk for which you want to cancel setup.

   e) Unmount the shared disk.

f) Delete the `jp1pc` directory and its subordinates that are in the environment directory on the logical host whose setup you want to cancel, on the local disk.

2. Cancel setup of a port number.

   This procedure is required only when a port number was specified by the `jpcnsconfig port` command during setup in an environment with a firewall.

   To cancel setup of a port number, set "`0`" as the port number. For details about setting port numbers, see section 6.4.

3. Cancel setup of Agent for DB2 in a logical host environment.

   Execute the `jpchasetup delete` command to delete the logical host environment, as shown in the following example. In this example, the logical host name of Agent for DB2 is specified as `tm1-ha1db2` and the instance name as `db2inst`.

   Note: If you delete a logical host environment while the shared disk is not mounted, only the setting of the logical host on the physical host will be deleted and the directories and files on the shared disk will not be deleted. In such a case, you must mount the shared disk and manually delete the `jp1pc` directory under the environment directory.

   To delete the logical host environment:

   a) Execute the `jpchasetup list` command to check the settings of the logical host environment to be deleted, such as the logical host name and the path to the shared disk, as shown in the following example:

      ```
      jpchasetup list all -lhost tm1-ha1db2
      ```

   b) Execute the `jpcinsunsetup` command to delete the instance environment of Agent for DB2, as shown in the following example:

      ```
      jpcinsunsetup agtr -lhost tm1-ha1db2 -inst db2inst
      ```

      When you execute the `jpcinsunsetup` command, the setting to start up the instances on the logical host will be deleted. At the same time, the files for the instances will be deleted from the shared disk.

   c) Execute the `jpchasetup delete` command to delete the logical host environment of Agent for DB2, as shown in the following example:

      ```
      jpchasetup delete agtr -lhost tm1-ha1db2
      ```

      When you execute the `jpchasetup delete` command, the setting to start up Agent for DB2 on the logical host will be deleted. At the same time, the file for the logical host will be deleted from the shared disk.

   d) Execute the `jpchasetup list` command to check that Agent for DB2 has been deleted from the logical host environment, as shown in the following example:

      ```
      jpchasetup list all
      ```

4. Cancel setup of the logical host environments for Collection Manager and other Agents.

   If you cancel setup of Collection Manager and any Agents other than Agent for DB2 from the same logical host, cancel setup of the logical host environments for them now.

   For details about the procedure for canceling setup of Collection Manager, see section 8.1.3. For details about the procedure for canceling setup of each Agent, see the section in this chapter that describes the procedure for your Agent.

5. Export the definitions of the logical host environment.

   After deleting the logical host environment for Agent for DB2, export the environment definitions to a file.

   To export the definitions of the logical host environment, use the `jpchasetup export` command. This command will output the definitions of the logical host environments for Collection Manager and the Agents to an export file. The export file may have any name. For example, to export the definitions of the logical host environment to the `lhostexp.txt` file, execute the following command:

   ```
   jpchasetup export -f lhostexp.txt
   ```

   Collection Manager and the Agents make the environment of the executing node match that of the standby node by exporting and importing the environment definitions.

   If you import to the standby node the environment definitions exported at the executing node (where environment definitions of Collection Manager and the Agents were deleted), they will be compared with the existing environment definitions of the standby node (where the definitions of Collection Manager and the Agents remain without being deleted). Then, differences (that is, the environment definitions of Collection Manager and the Agents that were deleted at the executing node) will be deleted from the standby node.

6. Copy the exported file to the standby node.

   Copy the logical host environment definition file that you exported at step 5 from the executing node to the standby node.

7. Unmount a shared disk.

   End operations by unmounting the file system on the UNIX host. If you want to continue to use the shared disk, you do not have to unmount the shared disk or file system.

7.7.5.2 Canceling Setup of the Standby Node's Logical Host Environment

Cancel setup of the logical host environment for Agent for DB2 at the standby node. To cancel setup, copy the definitions of the logical host environment exported at the executing node to the standby node.

You do not have to unmount the shared disk to cancel setup at the standby node.

To cancel setup of the logical host environment at the standby node:

1. Execute the `jpchasetup import` command to import the definitions of the logical host environment, as shown in the following example:

   ```
   jpchasetup import -f lhostexp.txt
   ```

   This command will change the environment settings for the standby node to those in the export file. This means the setting to start Agent for DB2 of the logical host will be deleted. If setup is canceled for the Collection Manager and Agents on other logical hosts, those settings will also be deleted.

   The setup for the fixed port number specified by the `jpcnsconfig port` command during setup will also be canceled.

2. Execute the `jpchasetup list` command to check that the setting of the logical host environment is the same as that for the executing node, as shown in the following example:

   ```
   jpchasetup list all
   ```

7.7.5.3 Unregistering the Cluster Software

Delete, from the cluster software, the settings related to Agent for DB2 on a logical host. For details on the deletion procedure, see the documentation for the cluster software.

7.7.5.4 Deleting Settings at Tuning Manager

Delete the definitions related to Agent for DB2 whose setup is to be canceled.

To delete the definitions:

1. Delete the Tuning Manager's Agent information. For example, if Tuning Manager is running on the logical host `tm1-ha1`, and Agent for DB2 is running on the logical host `tm1-ha1db2`, execute the following command in Tuning Manager:

   `jpcctrl delete` ***service-ID*** `host=tm1-ha1db2 lhost=tm1-ha1`

   In *service-ID*, specify the service ID of the Agent to be deleted.

2. Restart the Collection Manager services.
3. Restart Performance Reporter.

Chapter 8 Uninstalling Tuning Manager

This chapter describes how to uninstall Tuning Manager.

- Uninstalling from a Windows Host (see section 8.1)
- Uninstalling from a Solaris Host (see section 8.2)

8.1 Uninstalling from a Windows Host

The following describes how to uninstall Tuning Manager, as well as related preparations and precautions.

Note: Uninstalling Tuning Manager usually uninstalls HiRDB. However, if another HiCommand Suite product has been installed, then uninstallation of Tuning Manager does not uninstall HiRDB. For details about HiRDB, see section 1.1.1.

8.1.1 Before You Begin

Perform the following tasks before uninstalling Tuning Manager:

1. Stop all services registered to HiCommand Suite Common component.

   For details on how to stop services, see the *HiCommand Tuning Manager Server Administration Guide*.

   Note: Do not stop the `HiRDB/EmbeddedEdition _HD0` service. This service must always be running.

2. Uninstall all agents installed on the Tuning Manager server.

   For details on how to uninstall Agents, see Chapter 9.

3. For configurations in which Tuning Manager is run in SSO mode, from the command prompt, use the `hcmdsrep` command as follows to delete the start URL for the Tuning Manager server from the Device Manager server repository.

   ```
   "C:\Program Files\HiCommand\Base\bin\hcmdsrep" /delete /type TuningManager /user
   HiCommand-Device-Manager-user-name /pass HiCommand-Device-Manager-user-password
   ```

   The following explains the parameters:

   - `C:\Program Files\HiCommand\Base\bin\`-Enter the path of the default installation folder for HiCommand Suite Common Component used by Tuning Manager and Device Manager. If you changed the default installation path, alter the command line accordingly. If any folder name in the path includes one or more spaces, you must enclose the entire path with double quotes (`"`).
   - `hcmdsrep`-Enter the command name as displayed.
   - `delete`-The `hcmdsrep` action to perform. This must be entered exactly as shown.
   - `type`-This parameter indicates the type of start URL to be deleted. `TuningManager` must be entered exactly as shown.
   - *HDvM-admin-user-name*-This value is a Device Manager user name with administrative authority (the name of the user with the default administrator permissions is `system`).

     Case sensitivity for the user name is determined by the Device Manager server setting (this is case-insensitive by default). If this is case sensitive, enter a user name that perfectly matches the user name used for logging in to the Device Manager server.

– *HDvM-admin-password*-This value is the password for a user name with Device Manager administrator permissions (the default value is `manager`).

  Password case sensitivity is determined from the settings for the Device Manager server (case-insensitive by default). If this is case sensitive, enter a password that perfectly matches that of the user name used for logging in to the Device Manager server.

Example of using `hcmdsrep` to delete the Tuning Manager server launch address: The following gives an example of using the following values for the `hcmdsrep` command storage location and administrator login information to Device Manager, to delete the Tuning Manager server start URL from the Device Manager server repository.

– Location of `hcmdsrep` utility-`D:\Program Files\HiCommand\Base\bin\`

– *HDvM-admin-user-name*-`HDvMAdmin` (case-sensitive)

– *HDvM-admin-password*-`adminpass` (case-sensitive)

```
"D:\Program Files\HiCommand\Base\bin\hcmdsrep" /delete /type TuningManager /user
HDvMAdmin /pass adminpass
```

Note: For details on the `hcmdsrep` command, see the *HiCommand Tuning Manager Command Line Interface Guide*.

4. If Device Manager r2.3 or later is installed on the Tuning Manager server, stop the services related to Device Manager. For details on stopping the services related to Device Manager, see the *HiCommand Device Manager Server Installation and Configuration Guide*.

8.1.2 Uninstalling Tuning Manager

The following procedure describes how to uninstall Tuning Manager.

Notes:

- You must uninstall the contents installed from Server Part 2 before Server Part 1.
- After uninstalling Tuning Manager, some files or directories might remain undeleted. If you find remaining files or directories, delete them manually.
- Before uninstalling Tuning Manager, stop HiCommand Suite Common Component. If a HiCommand Suite product other than Tuning Manager that is using HiCommand Suite Common Component is running in the same server, stop that HiCommand Suite product, and then stop HiCommand Suite Common Component.
- During uninstallation of Tuning Manager, multiple Windows Security Alert dialog boxes might appear. In this case, click **Unblock** in all of these dialog boxes, and then continue the uninstallation.
- If you re-install Tuning Manager on a machine after uninstalling it, the `jpcctrl list` command might display two Trap Generator services. In this case, launch the Tuning Manager service, and then delete the inactive Trap Generator service by executing the `jpcctrl delete` command.

8.1.2.1 Uninstalling Server Part 2

1. Open the Windows Control Panel (see Figure 8.1).
2. Click on **Add/Remove Programs**. The Add/Remove Programs utility appears (see Figure 8.2).
3. Select **HiCommand Tuning Manager – Server Pert 2** in the Add/Remove Programs utility and click the **Change/Remove** button.

   Note: You must uninstall Server Part 2 before Server Part 1. This sequence is required.
4. When the Setup Type panel for Server Part 2 appears (see Figure 8.3), select **Uninstall**, and click **Next** to continue.
5. When the Uninstall panel for Server Part 2 appears (see Figure 8.4), click **Next** to uninstall Server Part 2. The progress of the uninstall operation is displayed.
6. Once Server Part 2 is uninstalled, the Server Part 2 Uninstallation Complete window is displayed (see Figure 8.5). Click **Finish** to complete uninstallation of Server Part 2.

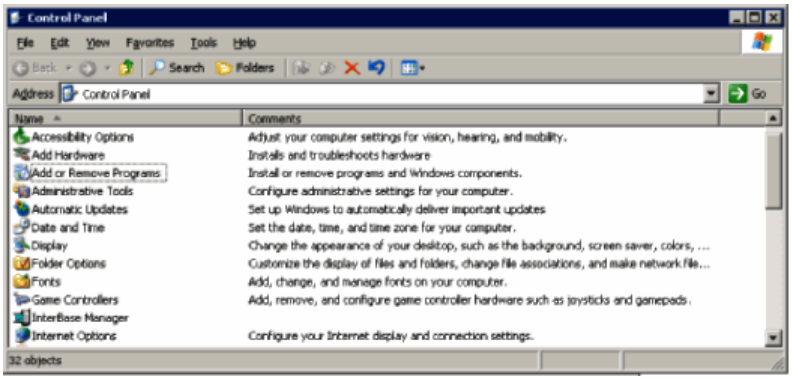


Figure 8.1 Windows Control Panel

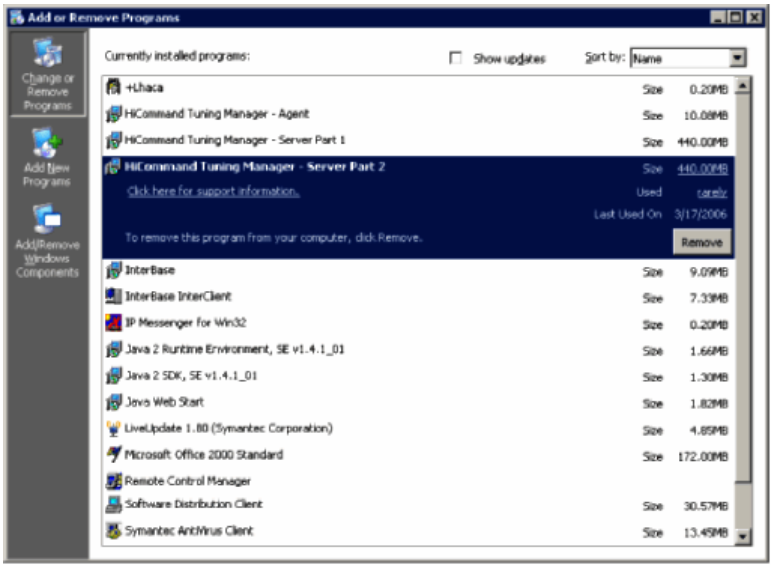


Figure 8.2 Windows Add/Remove Programs Utility

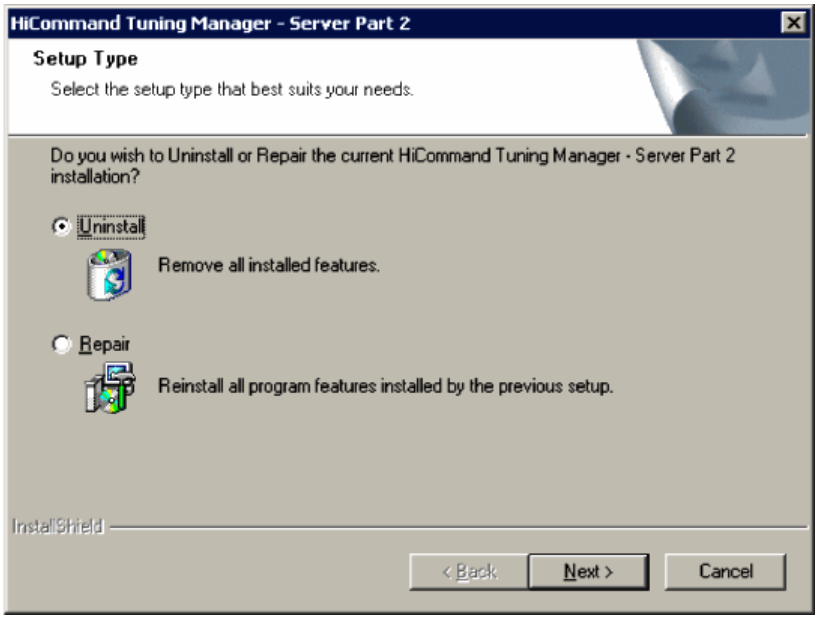


Figure 8.3 Selecting the Server Part 2 Uninstall Option

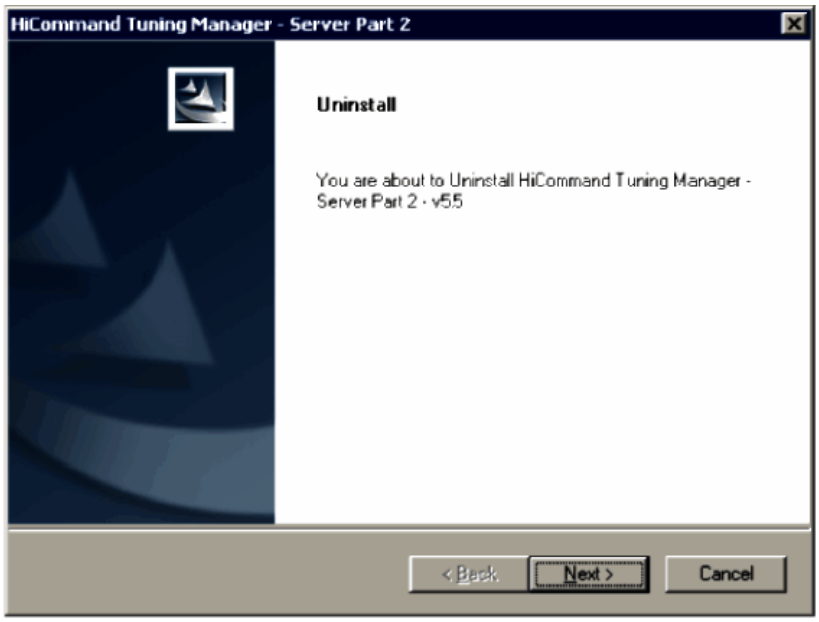


Figure 8.4 Starting Server Part 2 Uninstallation

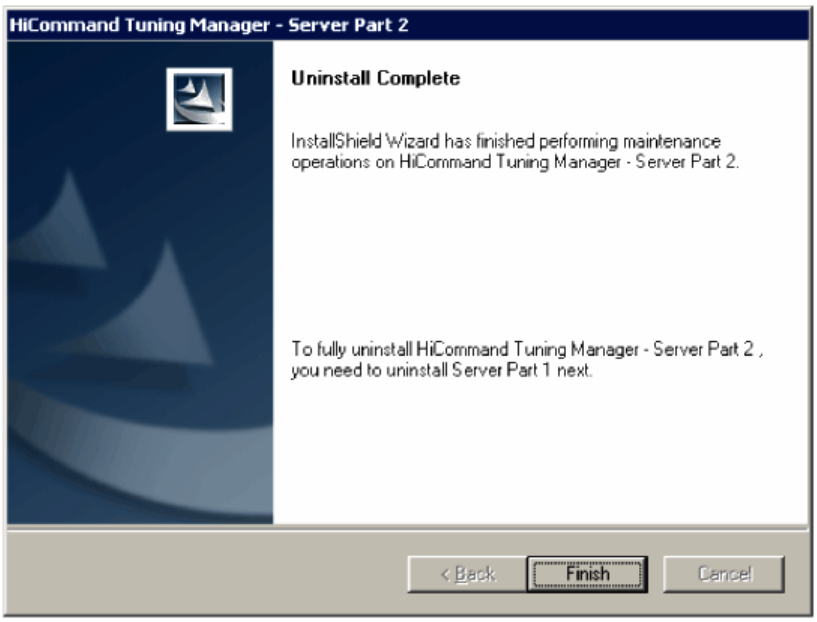


Figure 8.5 Server Part 2 Uninstallation Complete

8.1.2.2 Uninstalling Server Part 1

1. Open the Windows Control Panel.
2. Open the Add or Remove Programs window.
3. After the Server Part 2 uninstaller icon disappears from the task bar, on the **Add/Remove Programs** Control Panel, select **HiCommand Tuning Manager – Server Part 1**, and click the **Change/Remove** button.
4. When the Setup Type panel for Server Part 1 appears (see Figure 8.6), select **Uninstall** and click **Next** to continue.
5. When the Uninstall panel for Server Part 1 appears (see Figure 8.7), click **Next** to uninstall Server Part 1. The progress of the uninstall operation is displayed.
6. Once Server Part 1 is uninstalled, the Server Part 1 Uninstallation Complete window is displayed (see Figure 8.8). Click **Finish** to complete the uninstallation of Server Part 1.

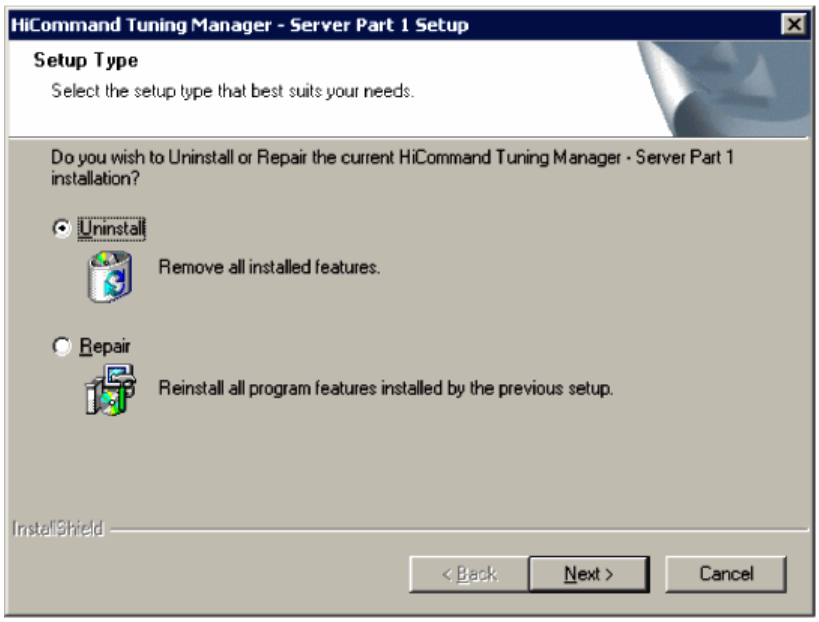


Figure 8.6 Selecting the Server Part 1 Uninstall Option

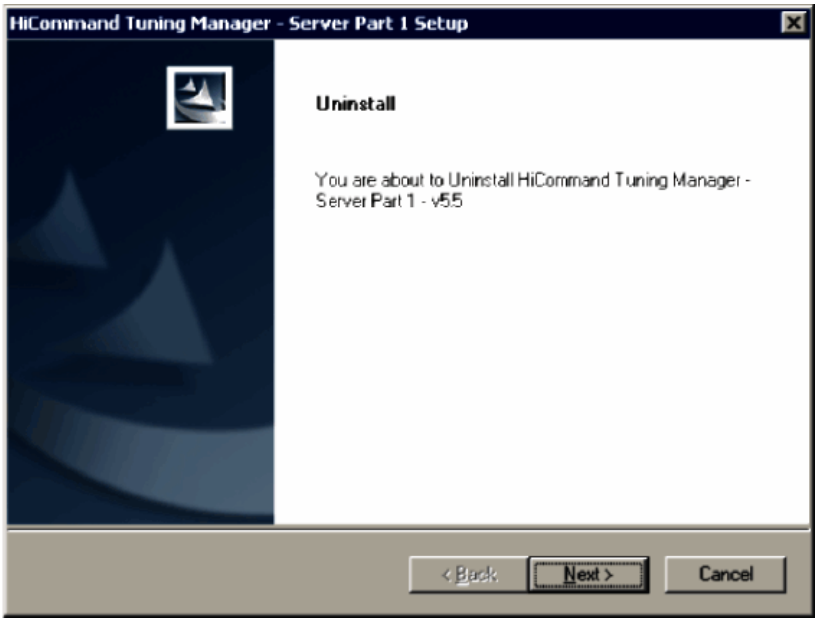


Figure 8.7 Starting Server Part 1 Uninstallation

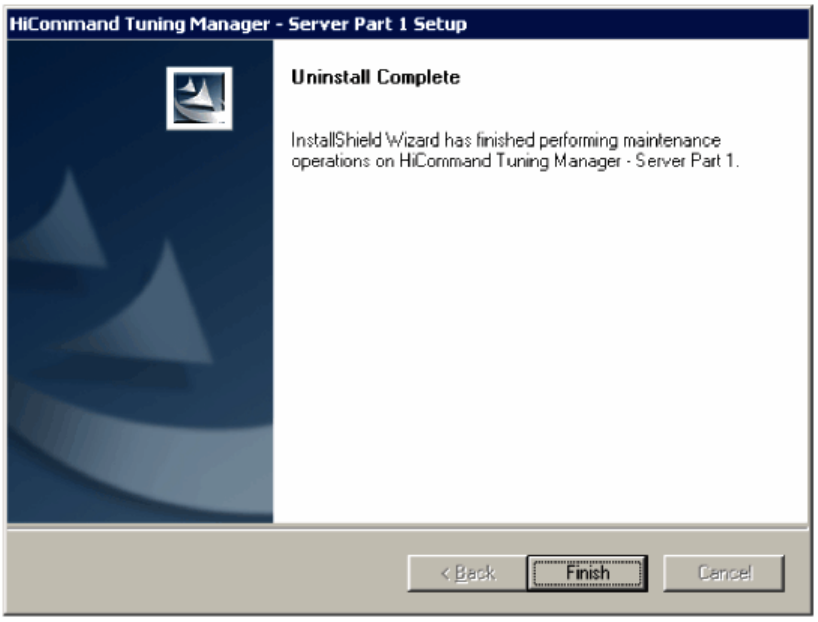


Figure 8.8 Server Part 1 Uninstallation Complete

8.1.3 Uninstalling in a Cluster System

When you uninstall Tuning Manager in a cluster environment, you need to complete the procedure on both the executing node and standby node.

Before you start the uninstallation, make sure the services on the executing node are online. If they are offline, place them online.

Note: If Tuning Manager is running in single sign-on mode, you must switch to standalone mode. For details on how to do this, see the *HiCommand Tuning Manager Server Administration Guide*.

8.1.3.1 Uninstalling Tuning Manager

To uninstall Tuning Manager:

1. Choose **Start**, **Settings**, **Control Panel**, **Administrative Tools**, and then **Cluster Administrator**. Cluster Administrator opens.
2. Place the following services offline:
   - Services related to Collection Manager
   - HiCommand Tuning Manager
   - HiCommand Tuning Service
   - HBase Storage Mgmt Web Service
   - HiCommand Performance Reporter
   - HiRDB/ClusterService _HD0
3. If the following resources are not being used by other applications, delete them:
   - Services related to Collection Manager
   - HiCommand Tuning Manager
   - HiCommand Tuning Service
   - HBase Storage Mgmt Web Service
   - HiCommand Performance Reporter
   - HiRDB/ClusterService _HD0
4. Execute the `jpchasetup` command to cancel the cluster configuration for Collection Manager.

   For details on the `jpchasetup` command, see the *HiCommand Tuning Manager Command Line Interface Guide*.
5. On the executing node, uninstall Tuning Manager (see Chapter 8).
6. On the executing node, delete all files and folders that are no longer required (such as those created during the installation in a cluster environment).
7. Switch the group for which the Tuning Manager service has been registered to **Standby**.

8. In Cluster Administrator, right-click the group to which the Tuning Manager service has been registered, and then choose **Move Group**.
9. Uninstall Tuning Manager from the standby node (see Chapter 8).

   Note: When uninstallation is performed on the standby node after the active node, the api-ERROR-8044 message is output. Despite the output of this message, the system correctly performs the uninstallation.
10. On the standby node, delete all files and folders that are no longer required (such as those created during the installation in a cluster environment).
11. If the following resources are not being used by other applications, place them offline and then delete them:
    - IP address
    - Shared disk
12. If you no longer require the group for which the Tuning Manager resources were registered, delete the group.

8.1.4 Uninstalling InterBase

Tuning Manager version 4.0 or later uses HiRDB as a database, not InterBase. Uninstall InterBase if your system meets the following conditions:

- Data migration from InterBase to HiRDB has been completed.
- Tuning Manager has been uninstalled and no other programs require InterBase.

Before uninstalling InterBase, back up the database. For details on database backup, see the *HiCommand Tuning Manager Server Administration Guide*. We also suggest that you consult the InterBase documentation for the current installation and release notes. In most installations, you can find these text files in the **Start** Menu (**Install Notes** and **Release Notes**, typically displayed by selecting **Start**, **Programs**, and **InterBase InterClient**).

8.1.4.1 Removing the InterServer Service

To remove the InterServer service:

1. Stop InterServer. For details on stopping InterServer, see the *HiCommand Tuning Manager Server Administration Guide*.
2. Open the InterServer Configuration Utility (located in the **Start** Menu under InterBase InterClient).The InterServer Configuration Utility panel is displayed (see Figure 8.9).
3. Click the **Advanced** tab (see Figure 8.10).
4. Click the **Remove** button to remove the InterServer service from the registry. A warning dialog appears asking you to confirm your choice (see Figure 8.11).
5. Click **Yes** to confirm and remove the InterServer service.
6. Delete the following line from the `services` file (located in, for example, `c:\`*`WinDir`*`\System32\Drivers\ETC\services`):

```
interserver      3060/tcp            # InterBase InterServer
```

7. Uninstall the InterClient® application. For details, see section 8.1.4.2.

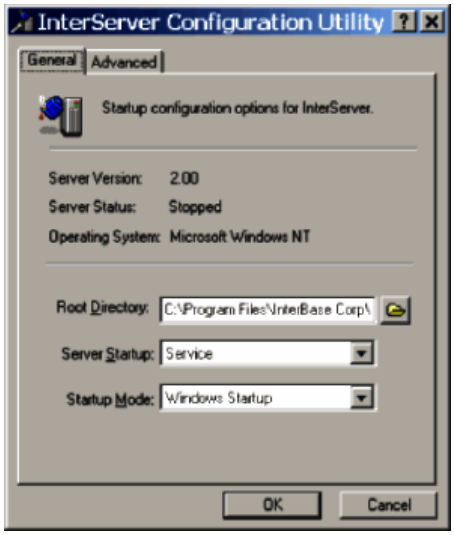


Figure 8.9 InterServer Configuration Utility

Figure 8.10 Removing the InterServer Service

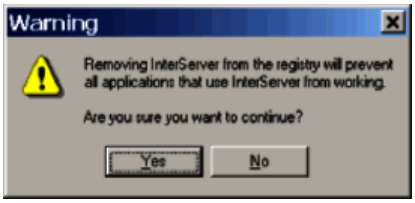


Figure 8.11 Confirmation of InterServer Service Removal

8.1.4.2 Uninstalling InterClient

To uninstall InterClient:

1. Open the Windows Control Panel (see Figure 8.12).
2. Click the **Add or Remove Programs** icon to display the Add or Remove Programs window (see Figure 8.13).
3. Select **InterBase InterClient** and click **Change/Remove**. A confirmation dialog asks you to confirm your choice (see Figure 8.14).
4. Click the **Yes** button to uninstall InterClient. The uninstallation progress is displayed in a dialog box.
5. When the message `Uninstall successfully completed` appears, click **OK** to close the dialog and complete the process.
6. Proceed to section 8.1.4.3 to uninstall the InterBase application.

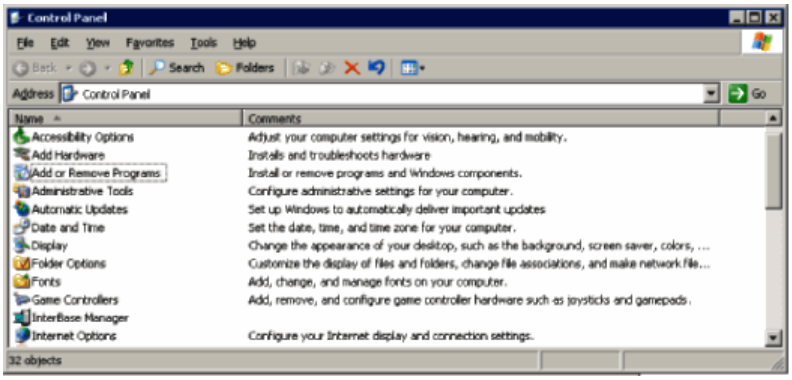


Figure 8.12 Windows Control Panel

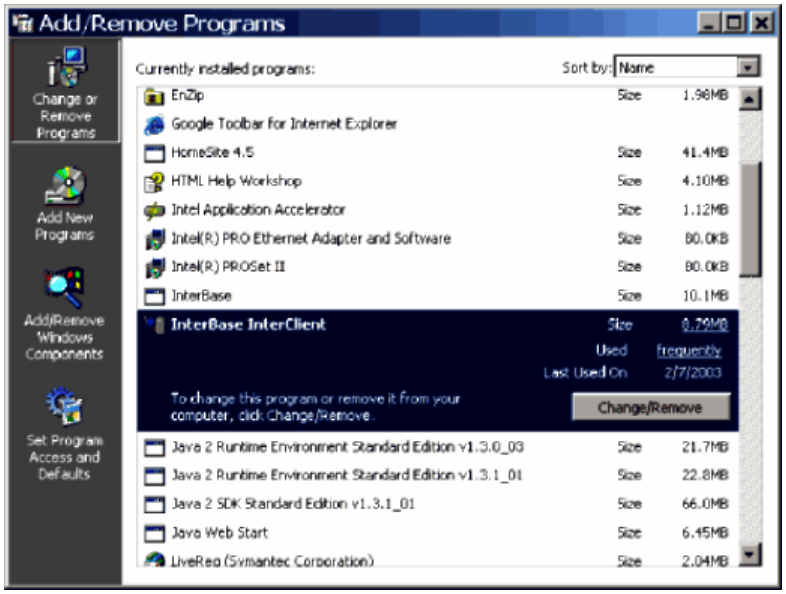


Figure 8.13 Windows Add/Remove Programs Utility

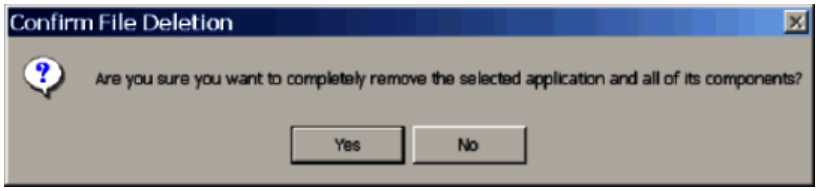


Figure 8.14 Confirming InterClient Uninstallation

8.1.4.3 Uninstalling InterBase Server

To uninstall InterBase Server:

1. Stop the InterBase Server and InterBase Guardian services. For details on stopping these services, see the *HiCommand Tuning Manager Server Administration Guide*.
2. Open the Windows control panel (see Figure 8.15).
3. Click the **Add or Remove Programs** icon to display the Add or Remove Programs window.
4. Select **InterBase** and click **Change/Remove**. The Uninstall InterBase dialog appears (see Figure 8.16).
5. Click **Uninstall** to begin removing InterBase. When InterBase is completely uninstalled, the completion dialog appears (see Figure 8.17) .
6. Click **Done** to close the dialog and complete InterBase uninstallation.

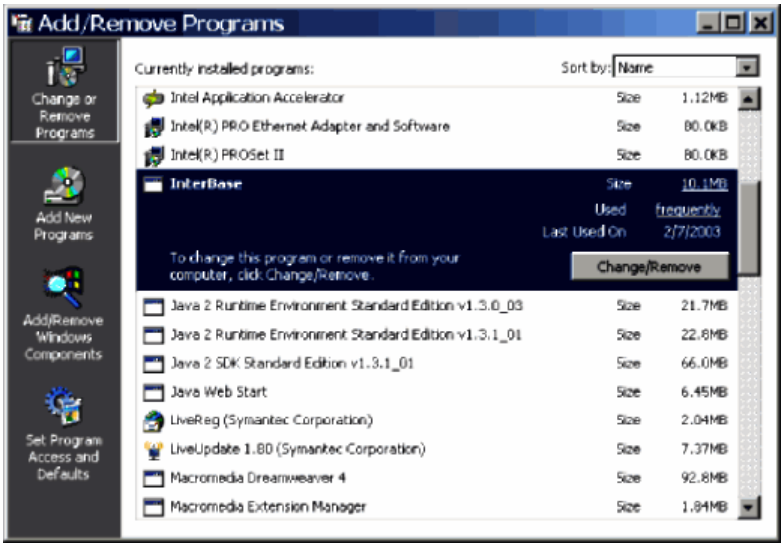


Figure 8.15 Windows Add/Remove Programs Utility

Figure 8.16 Confirming InterBase Uninstallation

Figure 8.17 InterBase Uninstall Completed

8.2 Uninstalling from a Solaris Host

The following describes how to uninstall Tuning Manager, as well as related preparations and precautions.

Note: Uninstalling Tuning Manager usually uninstalls HiRDB. However, if another HiCommand Suite product has been installed, then uninstallation of Tuning Manager does not uninstall HiRDB. For details about HiRDB, see section 1.1.1.

8.2.1 Before You Begin

Before uninstalling HiCommand Tuning Manager:

1. Log in to the host as `root` or use the `su` command to obtain root privileges in your current login session.
2. Stop all HiCommand-related services.

   For details on how to stop Device Manager-related services, see the *HiCommand Device Manager Server Installation and Configuration Guide*.

   Note: Some services may take longer to stop than others. Before proceeding, use the following `ps` command to determine whether all services for Tuning Manager have stopped:

   ```
   ps -ef | grep HiCommand
   ```

3. Uninstall all the agents installed on the Tuning Manager server.

   For details on how to uninstall agents, see Chapter 9.

4. For configurations in which Tuning Manager is run in SSO mode, from the command prompt, use the `hcmdsrep` command as follows to delete the start address for the Tuning Manager server from the Device Manager server repository.

   ```
   /opt/HiCommand/Base/bin/hcmdsrep -delete -type TuningManager-user <HDvM-admin-username>
   -pass <HDvM-admin-password>
   ```

   The following explains the parameters.

   - `/opt/HiCommand/Base/bin/`-Enter the path of the default installation folder for HiCommand Suite Common Component used by Tuning Manager and Device Manager.
   - `hcmdsrep`-Enter the command name as displayed.
   - `delete`-This command executes `hcmdsrep` actions. Make sure that this parameter is entered correctly.
   - `type`-This parameter indicates the type of start URL to be deleted. Note that it is case-sensitive. For Tuning Manager, enter `TuningManager`.
   - *HDvM-admin-username*-This value is the name of the Device Manager user with administrator permissions (the name of the default user with administrator permissions is `system`).

User name case sensitivity is determined from the settings for the Device Manager server (case-insensitive by default). If this is case sensitive, enter a user name that perfectly matches that used for logging in to the Device Manager server.

– *HDvM-admin-password*-This value is the password for a user name with Device Manager administrator permissions (the default value is `manager`).

Password case sensitivity is determined from the settings for the Device Manager server (case-insensitive by default). If this is case sensitive, enter a password that perfectly matches that of the user name used for logging in to the Device Manager server.

The following gives an example of using the following values for the `hcmdsrep` command storage location and administrator login information to Device Manager, to delete the Tuning Manager server start URL from the Device Manager server repository.

– Location of `hcmdsrep` utility–`/opt/HiCommand/Base/bin/`

– *HDvM-admin-user-name*–`HDvMAdmin` (case-sensitive)

– *HDvM-admin-password*–`adminpass` (case-sensitive)

```
/opt/HiCommand/Base/bin/hcmdsrep -delete -type TuningManager-user HDvMAdmin -pass
adminpass
```

Note: For details on the `hcmdsrep` command, see the *HiCommand Tuning Manager Command Line Interface Guide*.

5. If Device Manager r2.3 or later is installed on the Tuning Manager server, stop the services related to Device Manager. For details on stopping the services related to Device Manager, see the *HiCommand Device Manager Server Installation and Configuration Guide*.

8.2.2 Uninstalling Tuning Manager

Notes:

- You must uninstall Server Part 2 before Server Part 1.
- After you uninstall Tuning Manager, some files or directories might remain undeleted. If you find remaining files or directories, delete them manually.
- Before uninstalling Tuning Manager, stop HiCommand Suite Common Component. If a HiCommand Suite product other than Tuning Manager that is using HiCommand Suite Common Component is running in the same server, stop that HiCommand Suite product, and then stop HiCommand Suite Common Component.
- If you re-install Tuning Manager on a machine after uninstalling it from the same machine, the `jpcctrl list` command might display two Trap Generator services. In this case, launch the Tuning Manager service, and then delete the inactive Trap Generator service by executing the `jpcctrl delete` command.

The following procedure describes how to uninstall Tuning Manager.

8.2.2.1 Uninstalling Server Part 2

To uninstall Tuning Manager:

1. Change directories to where the uninstall scripts are located:

```
cd /opt/HiCommand/TuningManager/uninstall
```

2. Start the uninstall script for Server Part 2:

```
./uninstall-ServerPart2.sh
```

The following message is displayed:

```
Uninstalling HiCommand Tuning Manager - Server Part 2
Do you wish to start the uninstallation?
To continue, enter Y. (Default Y) Y/N >
```

3. Type `Y` to remove the package.

After the uninstallation of the Server Part 2 package completes, the following completion message is displayed:

```
Done uninstalling HiCommand Tuning Manager - Server Part 2
To complete uninstall, uninstall HiCommand Tuning Manager - Server Part 1
```

8.2.2.2 Uninstalling Server Part 1

1. Change directories to where the uninstall scripts are located:

```
cd /opt/HiCommand/TuningManager/uninstall
```

2. Start the uninstall script for Server Part 1:

```
./uninstall-ServerPart1.sh
```

The following message is displayed:

```
Uninstalling HiCommand Tuning Manager - Server Part 1
Do you wish to start the uninstallation?
To continue, enter Y. (Default Y) Y/N >
```

3. Type `Y` to remove the package.

After the uninstallation of the Server Part 1 package completes, the following completion message is displayed:

```
Done uninstalling HiCommand Tuning Manager - Server Part 1
```

8.2.3 Uninstalling in a Cluster System

When you uninstall Tuning Manager in a cluster environment, you need to complete the procedure on both the executing node and standby node.

Before you start the uninstallation, make sure the services on the executing node are online. If they are offline, place them online.

Note: If Tuning Manager is running in single sign-on mode, you must switch to standalone mode. For details on how to do this, see the *HiCommand Tuning Manager Server Administration Guide*.

8.2.3.1 Uninstalling Tuning Manager

1. Place the following services offline, and then release the resources:
   - Collection Manager
   - HiCommand Tuning Manager
   - HiCommand Tuning Service
   - HBase Storage Mgmt Web Service
   - HiCommand Performance Reporter
   - HiRDB

   For VERITAS Cluster Server

   a) Start VERITAS Cluster Manager.

   b) Place the services offline.

   c) Select each service taken offline in the above step, right-click the service, and then clear the **Enable** check box displayed in the shortcut menu.

   For Sun Cluster

   For Sun Cluster, use the `scrgadm` command provided by Sun Cluster to clear resources. For details on the format and how to use the `scrgadm` command, refer to the Sun Cluster documentation.

   a) Execute the following command to disable the monitoring of the service resources for HiCommand Suite Common Component and Tuning Manager:
   `# /usr/cluster/bin/scswitch -n -M -j` *resource-name*

   b) Execute the following command to disable the service resources for HiCommand Suite Common Component and Tuning Manager:
   `# /usr/cluster/bin/scswitch -n -j` *resource-name*

2. If the following resources are not being used by other applications, delete them:
   - Collection Manager
   - HiCommand Tuning Manager
   - HiCommand Tuning Service
   - HBase Storage Mgmt Web Service
   - HiCommand Performance Reporter

- HiRDB

3. Execute the jpchasetup command to cancel the cluster configuration for Collection Manager.

   For details on the `jpchasetup` command, see the *HiCommand Tuning Manager Command Line Interface Guide*.

4. On the executing node, uninstall Tuning Manager (see section 8.2.2).
5. On the executing node, delete all files and folders that are no longer required (such as those created during the installation in a cluster environment).
6. Switch to the standby node the group for which the Tuning Manager service is registered.
7. Uninstall Tuning Manager from the standby node (see section 8.2.2).

   Note: After uninstallation of Tuning Manager from the executing node, uninstallation of Tuning Manager from the standby node causes the api-ERROR-8044 message to be output. Despite the output of this message, the system correctly performs the uninstallation.

8. On the standby node, delete all files and folders that are no longer required (such as those created during the installation in a cluster environment).
9. If no other application is using the following resources, place the resources offline and then delete them:
   - IP address
   - Shared disk
10. If you no longer require the group for which the Tuning Manager resources were registered, delete the group.
11. When Tuning Manager was set up, the commands for operating the services of each program product were copied to a location that the cluster software recognizes. Since these copied commands cannot be deleted by uninstalling the program products, execute the following commands to delete them:

    ```
    rm /etc/init.d/cluster_hicommand-CWS
    rm /etc/init.d/cluster_hicommand-TM
    rm /etc/init.d/cluster_hicommand-TS
    rm /etc/init.d/cluster_hicommand-PR
    ```

12. Because the repository stored in the shared disk during creation of the cluster system cannot be deleted by uninstalling the program products, you must delete them manually.

8.2.4 Uninstalling InterBase

Tuning Manager version 4.0 or later uses HiRDB as a database, not InterBase. Uninstall InterBase if your system meets the following conditions:

- Data migration from InterBase to HiRDB has been completed.
- Tuning Manager has been uninstalled and no other programs require InterBase.

Before uninstalling InterBase, back up the database. For details on database backup, see the *HiCommand Tuning Manager Server Administration Guide*.

8.2.4.1 Uninstalling InterBase Server

1. Log in to the host as `root` or use the `su root` command to obtain root privileges in your current login session.
2. Stop the InterBase service:

```
/etc/init.d/interbaseserver stop
```

3. Use the `pkgrm` command to remove InterBase:

```
pkgrm IBCSN60
```

4. If you will be neither re-installing InterBase nor using the existing database, use the following command to remove the InterBase directory:

```
rm -Rf /opt/interbase
```

Note: If this is a symbolic link to another directory, also remove the physical directory.

8.2.4.2 Uninstalling InterClient

1. Remove the `interclient` directory and its contents:

```
rm -Rf /usr/interclient
```

   Note: If this is a symbolic link to another directory, also remove the physical directory.

2. Edit the `/etc/services` file to remove the following line:

```
interserver     3060/tcp
```

3. Edit the `/etc/inetd.conf` file to remove the following line:

```
interserver stream tcp nowait root
/usr/interclient/bin/interserver interserver
```

4. Determine the process ID (PID) for the `inetd` daemon:

```
ps -ef | grep inetd
```

5. Restart `inetd`:

```
kill -HUP process-ID
```

6. Remove the `interbaseserver` script:

```
rm -f /etc/init.d/interbaseserver
```

7. Remove the symbolic links to the `interbaseserver` script:

```
rm -f /etc/rc*.d/*interbaseserver
```

Chapter 9 Uninstalling Agents

This chapter describes points to be checked before you uninstall Agents on a Windows host or UNIX host, notes for the uninstallation, and the procedure for uninstalling an Agent. For details about the procedure for uninstalling Tuning Manager, see Chapter 8.

- Uninstalling from a Windows Host (see section 9.1)
- Uninstalling from a UNIX Host (see section 9.2)
- Uninstalling in a Cluster System (see section 9.3)

9.1 Uninstalling from a Windows Host

Before you start an uninstallation, please review the following requirements and notes.

- Uninstalling an Agent deletes performance data that was created by the Agent, and you will no longer be able to use the performance data.
- When you uninstall the Agent that constructs an instance environment, first delete the instance environment, and then uninstall the Agent. For details on how to delete an instance environment, see Chapter 7.
- If you update a file that is being used by another application program or the OS, a message is displayed, prompting you to restart the system. In this case, you must restart the system in order to complete uninstallation.
- Uninstalling an Agent does not delete the port numbers defined in the `services` file.
- To uninstall Agent for RAID Map, Agent for Platform, and Agent for Microsoft Exchange Server, you will need to uninstall HTM Agent (the program named **HiCommand Tuning Manager - Agent**). This operation will uninstall Agent for RAID Map, Agent for Platform, and Agent for Microsoft Exchange Server at the same time. When you want to uninstall only Agent for Microsoft Exchange Server, see section 9.1.1.
- Installing HTM Agent automatically executes a command that enables the disk performance counter. In this status, uninstalling HTM Agent does not disable the counter. To disable the counter, you must execute the `DISKPERF -N` command at the Windows command prompt, and then restart the computer.
- Before uninstalling Agent for Oracle or Agent for Microsoft SQL Server, execute the `jpcinssetup` command to check the output folder for the Agent logs. If the output folder for the Agent logs is set to a folder other than the default folder, uninstalling the Agent does not delete the Agent logs. In this case, the Agent log files must be deleted manually after the uninstallation. The default output folder for Agent logs is as follows:
  - *installation-folder*`\agto\agent\`*instance-name*`\log\` (for Agent for Oracle)
  - *installation-folder*`\agtq\agent\`*instance-name*`\log\` (for Agent for Microsoft SQL Server)
- Some files or folders may remain after uninstallation. If files remain, manually delete all files under the installation folder.
- After uninstalling Agents, delete the service information for uninstalled Agents on a Tuning Manager host. To delete the service information, execute the `jpcctrl delete` command.

To uninstall an Agent from a Windows host:

1. On the host from which the Agent is to be uninstalled, log in as a user who belongs to the Administrators group of the local computer.

   Before proceeding to the next step, make sure that you are a member of the Administrators group.

2. Display the service information to confirm that no services of the Tuning Manager series programs are running on the local host. If any such services are running, stop them.

   If any services of the Tuning Manager series programs are running, they will be automatically terminated during uninstallation.

3. If any other application programs are running, terminate them.

4. From the Windows **Control Panel**, choose **Add/Remove Programs**.

   A dialog box is displayed in which you can select the program to be uninstalled.

5. Select the program you wish to uninstall, and then execute uninstallation.

9.1.1 Uninstalling Agent for Microsoft Exchange Server

On a Windows host, if you want to uninstall only Agent for Microsoft Exchange Server (and not Agent for RAID Map and Agent for Platform), perform an overwrite installation of HTM Agent. When selecting the components to be installed, deselect Agent for Microsoft Exchange Server and perform an overwrite installation. Then Agent for Microsoft Exchange Server will be uninstalled.

Note: If you perform an overwrite installation of HTM Agent, all patches applied to Agent for RAID Map and Agent for Platform are deleted. After the overwrite installation finishes, execute the `jpctminfo` command to check the history information of patches, and then install the patches again.

To uninstall only Agent for Microsoft Exchange Server from a Windows host:

1. On the host where Agent for Microsoft Exchange Server is installed, log in as a user who belongs to the Administrators group of the local computer.

   Before proceeding to the next step, make sure that you are a member of the Administrators group.

2. Stop all services of the Tuning Manager series program running on the local host.

   If any services of the Tuning Manager series programs are running, they will be automatically terminated during installation.

3. If any other application programs are running, terminate them.

4. Insert the installation CD-ROM for HTM Agent, and execute `setup.exe`.

5. Perform an overwrite installation of HTM Agent, in accordance with the installer's instructions. In the window for selecting the components to be installed, clear the **Agent for MSExchange** check box.

6. Check the common message log, after you finish the overwrite installation of HTM Agent.

   During the overwrite installation, additional setup may be executed as appropriate to the host environment. The execution results are output to the common message log. Once you have completed the overwrite installation, it is important to check the common message log to obtain the results of any additional setup.

9.2 Uninstalling from a UNIX Host

Before you start an uninstallation, please review the following requirements and notes.

- Uninstalling an Agent deletes performance data that was created by the Agent, and you will no longer be able to use the performance data.
- When you uninstall the Agent that constructs an instance environment, first delete the instance environment, and then uninstall the Agent. For details on how to delete an instance environment, see Chapter 7.
- Uninstalling an Agent does not delete the port numbers defined in the `services` file.
- To uninstall Agent for RAID Map or Agent for Platform, you will need to uninstall HTM Agent (the program named **HiCommand Tuning Manager - Agent**). This operation will uninstall Agent for RAID Map and Agent for Platform at the same time.
- Before uninstalling Agent for Oracle, execute the `jpcinssetup` command to check the output directory for the Agent logs. If the output directory for the Agent logs is set to a directory other than the default directory (`/opt/jp1pc/agto/agent/`*instance-name*`/log`), uninstalling the Agent does not delete the Agent logs. In this case, the Agent log files must be deleted manually after the uninstallation.
- After uninstalling Agents, delete the service information for uninstalled Agents on a Tuning Manager host. To delete the service information, execute the `jpcctrl delete` command.

To uninstall an Agent from a UNIX host:

1. On the host where the Agent is to be uninstalled, log in as a superuser or use the `su` command to change to the superuser.

   Before proceeding to the next step, make sure that you are a superuser.

2. Display the service information to confirm that no services of Tuning Manager series programs are running on the local host. If any such services are running, stop them.

   If any services of Tuning Manager series programs are running, they will be automatically terminated during uninstallation.

3. If any other application programs are running, terminate them.

4. Enter the uninstallation command with the required option specified:

   - For HP-UX, use the `swremove` command: `swremove HTM`*xxxx*
   - For Solaris, use the `pkgrm` command: `pkgrm HTM`*xxxx*
   - For AIX, use the `installp` command: `installp -u HTM`*xxxx*
   - For Linux, use the `rpm` command: `rpm -e HTM`*xxxx*

   Note: *xxxx* indicates a character string specific to each Agent. Specify the following character string according to the Agent to be uninstalled:

Table 9.1 Character String Specific to Each Agent

Agent	Character String Specific to Each Agent
Agent for RAID	`Raid`
HTM Agent	`Agent`
Agent for SAN Switch	`Switch`
Agent for NAS	`NAS`
Agent for Oracle	`Ora`
Agent for DB2	`DB2`

9.3 Uninstalling in a Cluster System

The procedure for uninstalling an Agent is the same as in non-clustered systems. For details about uninstalling Agents from a Windows host, see section 9.1, and for details about uninstalling Agents from a UNIX host, see section 9.2.

Notes:

- To uninstall an Agent, you must stop all services of the Tuning Manager series program at the node from which the Agent is to be uninstalled.
- If you uninstall an Agent without deleting the logical host environment, the environment directory might remain. You must delete the environment directory if it remains.

Appendix A Product Requirements

The following explains the product requirements needed to run the Tuning Manager series programs. Before you design a system that will use the Tuning Manager series programs, we recommend that you examine the performance of the computer to be used, to ensure that the computer is capable of running the Tuning Manager series programs.

A.1 Applicable OSs

The following explains the operating systems where the Tuning Manager series programs can run. Note that the Tuning Manager series programs can run in the language environment of any operating system.

A.1.1 Tuning Manager

For Windows

- Microsoft Windows 2000 Professional Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows 2000 Server Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows 2000 Advanced Server Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows Server 2003, Standard Edition (No Service Pack, Service Pack 1)
- Microsoft Windows Server 2003, Enterprise Edition (No Service Pack, Service Pack 1)
- Microsoft Windows Server 2003, Standard x64 Edition (Service Pack 1)
- Microsoft Windows Server 2003, Enterprise x64 Edition (Service Pack 1)
- Microsoft Windows Server 2003 R2, Standard Edition
- Microsoft Windows Server 2003 R2, Enterprise Edition
- Microsoft Windows Server 2003 R2, Standard x64 Edition#
- Microsoft Windows Server 2003 R2, Enterprise x64 Edition#

Notes:

- The terminal service of Windows is not supported.
- Only Microsoft Windows Server 2003, Enterprise Edition is supported for use in the cluster environment.
- The cluster software supports Microsoft Cluster Service only.

For Solaris

- Solaris 8
- Solaris 9

- Solaris 10

Notes:

- Solaris 9 is supported for use in the cluster environment.
- The cluster software supports Sun Microsystems Sun Cluster 3.1 and VERITAS Cluster Server 4.0.

A.1.2 Agent for RAID

For Windows

- Microsoft Windows 2000 Professional Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows 2000 Server Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows 2000 Advanced Server Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows Server 2003, Standard Edition (No Service Pack, Service Pack 1)
- Microsoft Windows Server 2003, Enterprise Edition (No Service Pack, Service Pack 1)
- Microsoft Windows Server 2003, Standard x64 Edition# (Service Pack 1)
- Microsoft Windows Server 2003, Enterprise x64 Edition# (Service Pack 1)
- Microsoft Windows Server 2003 R2, Standard Edition
- Microsoft Windows Server 2003 R2, Enterprise Edition
- Microsoft Windows Server 2003 R2, Standard x64 Edition#
- Microsoft Windows Server 2003 R2, Enterprise x64 Edition#

#: For Microsoft Windows Server 2003 x64 Edition, only WOW 64 (Windows on Windows 64) mode is supported.

*Note***:** This program product cannot be used in Windows Terminal Services. However, even in an environment in which Windows Terminal Services are installed, operation is possible provided that this program product is not used from Terminal Services.

For UNIX

- HP-UX 11.00
- HP-UX 11i V1
- HP-UX 11i V2 (PA-RISC)
- HP-UX 11i V2 (IPF) #1
- Solaris 8
- Solaris 9
- Solaris 10#2

- AIX 5L V5.1
- AIX 5L V5.2
- AIX 5L V5.3[#3]

#1: For HP-UX 11i V2 (IPF), monitoring of TagmaStore USP, the Lightning 9900V series, and the Lightning 9900 series only is supported. Monitoring of the TagmaStore AMS/WMS series, Thunder 9500V series, and Thunder 9200 is not supported.

#2: For Solaris 10, only a global zone operation is supported.

#3: For AIX 5L V5.3, you cannot use the SMT (Simultaneous multi-threading) function and Virtualization function.

A.1.3 HTM Agent

Note that **HTM Agent** is a generic name for HiCommand Tuning Manager - Agent.

For Windows

- Microsoft Windows 2000 Professional Operating System[#1] (Service Pack 3, Service Pack 4)
- Microsoft Windows 2000 Server Operating System[#1] (Service Pack 3, Service Pack 4)
- Microsoft Windows 2000 Advanced Server Operating System[#1] (Service Pack 3, Service Pack 4)
- Microsoft Windows Server 2003, Standard Edition (No Service Pack, Service Pack 1)
- Microsoft Windows Server 2003, Enterprise Edition (No Service Pack, Service Pack 1)
- Microsoft Windows Server 2003, Enterprise Edition (IPF) [#1] (No Service Pack, Service Pack 1)
- Microsoft Windows Server 2003, Standard x64 Edition[#1#2] (Service Pack 1)
- Microsoft Windows Server 2003, Enterprise x64 Edition[#1#2] (Service Pack 1)
- Microsoft Windows Server 2003 R2, Standard Edition
- Microsoft Windows Server 2003 R2, Enterprise Edition
- Microsoft Windows Server 2003 R2, Standard x64 Edition[#1#2]
- Microsoft Windows Server 2003 R2, Enterprise x64 Edition[#1#2]

#1: Agent for Microsoft Exchange Server does not support these operating systems.

#2: For Microsoft Windows Server 2003 x64 Edition, only WOW 64 mode is supported.

Note: This program product cannot be used in Windows Terminal Services. However, even in an environment in which Windows Terminal Services are installed, operation is possible provided that this program product is not used from Terminal Services.

For UNIX

- HP-UX 11.00
- HP-UX 11i V1
- HP-UX 11i V2 (PA-RISC)
- HP-UX 11i V2 (IPF)
- Solaris 8
- Solaris 9
- Solaris 10[#1]
- AIX 5L V5.1
- AIX 5L V5.2
- AIX 5L V5.3[#2]
- Red Hat Enterprise Linux AS 3(x86) 2.4.21-4.EL
- Red Hat Enterprise Linux ES 3(x86) 2.4.21-4.EL
- Red Hat Enterprise Linux AS 3(x86) 2.4.21-20.EL
- Red Hat Enterprise Linux ES 3(x86) 2.4.21-20.EL
- Red Hat Enterprise Linux AS 3(x86) 2.4.21-27.EL
- Red Hat Enterprise Linux ES 3(x86) 2.4.21-27.EL
- Red Hat Enterprise Linux AS 3(x86) 2.4.21-32.EL
- Red Hat Enterprise Linux ES 3(x86) 2.4.21-32.EL
- Red Hat Enterprise Linux AS 3(IPF) 2.4.21-4.EL
- Red Hat Enterprise Linux AS 3(IPF) 2.4.21-20.EL
- Red Hat Enterprise Linux AS 4(x64) 2.6.9-11.EL
- Red Hat Enterprise Linux ES 4(x64) 2.6.9-11.EL
- Red Hat Enterprise Linux AS 4(x86) 2.6.9-11.EL
- Red Hat Enterprise Linux ES 4(x86) 2.6.9-11.EL
- Red Hat Enterprise Linux AS 4(IPF) 2.6.9-11.EL

#1: For Solaris 10, only a global zone operation is supported.

#2: For AIX 5L V5.3, you cannot use the SMT function and Virtualization function.

Note: When installing Agent for Platform on an AIX host, Agent for Platform selects a module to be installed, based on the loaded kernel information. Therefore, when you want to change the number of kernel bits, uninstall HTM Agent before the change. Then after changing the number of kernel bits, re-install HTM Agent.

A.1.4 Agent for SAN Switch

For Windows

- Microsoft Windows 2000 Professional Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows 2000 Server Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows 2000 Advanced Server Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows Server 2003, Standard Edition (No Service Pack, Service Pack 1)#
- Microsoft Windows Server 2003, Enterprise Edition (No Service Pack, Service Pack 1)#

#: Microsoft Windows Server 2003 is supported for monitoring Brocade switches, but not supported for monitoring McDATA switches.

Note: This program product cannot be used in Windows Terminal Services. However, even in an environment in which Windows Terminal Services are installed, operation is possible provided that this program product is not used from Terminal Services.

For UNIX

- HP-UX 11.00
- HP-UX 11i V1
- Solaris 8
- Solaris 9
- Solaris 10#1#2
- AIX 5L V5.1
- AIX 5L V5.2#3
- AIX 5L V5.3#3#4

#1: For Solaris 10, only a global zone operation is supported.

#2: Solaris 10 is supported for monitoring Brocade switches, but not supported for monitoring McDATA switches.

#3: AIX 5L V5.2 and AIX 5L V5.3 are supported for monitoring Brocade switches, but not supported for monitoring McDATA switches.

#4: If you use AIX 5L V5.3, you cannot use any of the following: a 64-bit environment, the SMT function, and the Virtualization function.

Note: The API that Agent for SAN Switch uses to monitor Brocade switches differs depending on the OS version. When you upgrade from Solaris 8 to Solaris 9 or 10, or from AIX 5L 5.1 to AIX 5L 5.2 or 5.3, after changing the OS version, you need to perform an overwrite installation of Agent for SAN Switch. When the overwrite installation is performed, the API corresponding to your OS version is automatically selected. Note that you need to re-install the patches, because the patches that have been applied to Agent for SAN Switch are deleted during the overwrite installation.

A.1.5 Agent for NAS

For Windows

- Microsoft Windows 2000 Professional Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows 2000 Server Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows 2000 Advanced Server Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows Server 2003, Standard Edition (No Service Pack, Service Pack 1)
- Microsoft Windows Server 2003, Enterprise Edition (No Service Pack, Service Pack 1)
- Microsoft Windows Server 2003, Standard x64 Edition[#] (Service Pack 1)
- Microsoft Windows Server 2003, Enterprise x64 Edition[#] (Service Pack 1)
- Microsoft Windows Server 2003 R2, Standard Edition
- Microsoft Windows Server 2003 R2, Enterprise Edition

#: For Microsoft Windows Server 2003 x64 Edition, only WOW 64 mode is supported.

Note: This program product cannot be used in Windows Terminal Services. However, even in an environment in which Windows Terminal Services are installed, operation is possible provided that this program product is not used from Terminal Services.

For UNIX

- HP-UX 11.00
- HP-UX 11i V1
- HP-UX 11i V2 (PA-RISC)
- Solaris 8
- Solaris 9
- Solaris 10[#1]
- AIX 5L V5.1
- AIX 5L V5.2
- AIX 5L V5.3[#2]

#1: For Solaris 10, only a global zone operation is supported.

#2: For AIX 5L V5.3, you cannot use the SMT function and Virtualization function.

A.1.6 Agent for Oracle

For Windows

- Microsoft Windows 2000 Professional Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows 2000 Server Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows 2000 Advanced Server Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows Server 2003, Standard Edition (No Service Pack, Service Pack 1)
- Microsoft Windows Server 2003, Enterprise Edition (No Service Pack, Service Pack 1)
- Microsoft Windows Server 2003 R2, Standard Edition
- Microsoft Windows Server 2003 R2, Enterprise Edition

Note: This program product cannot be used in Windows Terminal Services. However, even in an environment in which Windows Terminal Services are installed, operation is possible provided that this program product is not used from Terminal Services.

For UNIX

- HP-UX 11.00
- HP-UX 11i V1
- HP-UX 11i V2 (PA-RISC)
- HP-UX 11i V2 (IPF)
- Solaris 8
- Solaris 9
- Solaris 10[#1]
- AIX 5L V5.1
- AIX 5L V5.2
- AIX 5L V5.3[#2]

#1: For Solaris 10, only a global zone operation is supported.

#2: For AIX 5L V5.3, you cannot use the SMT function and Virtualization function.

A.1.7 Agent for Microsoft SQL Server

- Microsoft Windows 2000 Server Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows 2000 Advanced Server Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows Server 2003, Standard Edition (No Service Pack, Service Pack 1)
- Microsoft Windows Server 2003, Enterprise Edition (No Service Pack, Service Pack 1)
- Microsoft Windows Server 2003 R2, Standard Edition
- Microsoft Windows Server 2003 R2, Enterprise Edition

Note: This program product cannot be used in Windows Terminal Services. However, even in an environment in which Windows Terminal Services are installed, operation is possible provided that this program product is not used from Terminal Services.

A.1.8 Agent for DB2

- AIX 5L V5.1
- AIX 5L V5.2
- AIX 5L V5.3#
- Red Hat Enterprise Linux AS 3(x86) 2.4.21-4.EL
- Red Hat Enterprise Linux ES 3(x86) 2.4.21-4.EL

#: For AIX 5L V5.3, you cannot use the Virtualization function.

A.2 Monitoring Targets

The following describes the monitoring targets of each Agent. For notes on monitoring targets, see section 4.2.

A.2.1 Agent for RAID

Agent for RAID can monitor the following storage subsystems and their respective microcode prerequisites. If you want to monitor a storage subsystem that is older than a prerequisite microcode version shown in Table A.1, update the microcode version.

Note that some Agent for RAID functions cannot be used in some microcode versions of the storage subsystem. For details on the correspondence between the microcode versions of the storage subsystem and the Agent for RAID functions, see the *HiCommand Tuning Manager Hardware Reports Reference*.

Table A.1 Supported Storage Subsystems

Product Name	Microcode
▪ Thunder 9200	Version 0559 or later
Thunder 9500V series ▪ Thunder 9520V ▪ Thunder 9530V ▪ Thunder 9570V ▪ Thunder 9580V ▪ Thunder 9585V	▪ For Thunder 9520V: Version 0659/M or later ▪ For Thunder 9530V and Thunder 9570V: Version 0651 or later ▪ For Thunder 9580V and Thunder 9585V: Version 1655 or later
Lightning 9900 series ▪ Lightning 9910 ▪ Lightning 9960	Version 01-13 or later
Lightning 9900V series ▪ Lightning 9970V ▪ Lightning 9980V	Version 13-02 or later
TagmaStore AMS series ▪ TagmaStore AMS200 ▪ TagmaStore AMS500	For TagmaStore AMS200 and TagmaStore AMS500 Version 0710 or later
▪ TagmaStore AMS1000	For TagmaStore AMS1000 Version 0731/A or later
TagmaStore WMS series ▪ TagmaStore WMS100	Version 0720/A or later
TagmaStore USP ▪ TagmaStore USP100 ▪ TagmaStore USP600 ▪ TagmaStore USP1100	Version 50-05-57 or later, 50-06-21 or later, or 50-07-69 or later (see *Note*)

▪ TagmaStore NSC55	

Note: When the microcode version for TagmaStore USP is earlier than 50-05-57, between 50-06-00 and 50-06-20, or between 50-07-00 and 50-07-68, delays will occur in the I/O response from a host that uses the same CHP as that used by the port for the Agent for RAID command device.

To use Agent for RAID to monitor a storage subsystem, the programs shown in Table A.2 must be installed in the storage subsystem to be monitored.

Table A.2 Programs that Must Be Installed in the Storage Subsystem

Product Name	Monitored Storage Subsystem	Requirements
LUN Manager (see *Note 1*)	▪ Lightning 9900 series ▪ Lightning 9910 ▪ Lightning 9960 ▪ Lightning 9900V series ▪ Lightning 9970V ▪ Lightning 9980V ▪ TagmaStore USP ▪ TagmaStore USP100 ▪ TagmaStore USP600 ▪ TagmaStore USP1100 ▪ TagmaStore NSC55	Must be installed

HITACHI Internal Hierarchical Storage Management (HIHSM) (see *Note 2*)	▪ Lightning 9900 series ▪ Lightning 9910 ▪ Lightning 9960	For acquiring values in the following fields:
Performance Monitor (see *Note 2*)	▪ Lightning 9900V series ▪ Lightning 9970V ▪ Lightning 9980V ▪ TagmaStore USP ▪ TagmaStore USP100 ▪ TagmaStore USP600 ▪ TagmaStore USP1100 ▪ TagmaStore NSC55	▪ PI_RGS record - Busy % (BUSY_RATE) - Max Busy % (MAX_BUSY_RATE)

Note 1: LUN Manager is an optional program product for Remote Console (Lightning 9900 series) or Storage Navigator (TagmaStore USP or Lightning 9900V series). It is used for configuring a command device.

Note 2: If the microcode version of TagmaStore USP is 50-03-50 or later, this program product is not needed.

When using Agent for RAID installed in a UNIX host to monitor TagmaStore USP, Lightning 9900V series, or Lightning 9900 series, make sure that RAID Manager LIB is installed in the same host on which Agent for RAID is installed.

A.2.2 Agent for RAID Map

Agent for RAID Map can monitor the following storage subsystems.

- Thunder 9200
- Thunder 9500V series:
  - Thunder 9520V
  - Thunder 9530V
  - Thunder 9570V
  - Thunder 9580V
  - Thunder 9585V
- Lightning 9900 series:
  - Lightning 9910
  - Lightning 9960
- Lightning 9900V series:
  - Lightning 9970V
  - Lightning 9980V
- TagmaStore AMS series:

- TagmaStore AMS200
- TagmaStore AMS500
- TagmaStore AMS1000

- TagmaStore WMS series:
  - TagmaStore WMS100
- TagmaStore USP
  - TagmaStore USP100
  - TagmaStore USP600
  - TagmaStore USP1100
  - TagmaStore NSC55

The devices monitored by Agent for RAID Map are listed below:

- For HP-UX:

  Devices under `/dev/dsk`
- For Solaris:

  Devices under `/dev/dsk`
- For AIX:

  Devices under `/dev/hdisk`*xx*
- For Linux:

  Devices under `/dev/sd`*xx*, `/dev/md`*xxx*, and `/dev/hd`*xx*

When a volume management program is used, Agent for RAID Map monitors the devices managed by the volume management program. For details about the volume management programs supported by Agent for RAID Map, see section A.4.3.

A.2.3 Agent for Platform (Windows)

Agent for Platform (Windows) can monitor the following programs:

- Microsoft Windows 2000 Professional Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows 2000 Server Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows 2000 Advanced Server Operating System (Service Pack 3, Service Pack 4)
- Microsoft Windows Server 2003, Standard Edition (No Service Pack, Service Pack 1)
- Microsoft Windows Server 2003, Enterprise Edition (No Service Pack, Service Pack 1)
- Microsoft Windows Server 2003, Enterprise Edition (IPF) (No Service Pack, Service Pack 1)
- Microsoft Windows Server 2003, Standard x64 Edition (Service Pack 1)
- Microsoft Windows Server 2003, Enterprise x64 Edition (Service Pack 1)

- Microsoft Windows Server 2003 R2, Standard Edition
- Microsoft Windows Server 2003 R2, Enterprise Edition
- Microsoft Windows Server 2003 R2, Standard x64 Edition
- Microsoft Windows Server 2003 R2, Enterprise x64 Edition

A.2.4 Agent for Platform (UNIX)

Agent for Platform (UNIX) can monitor the following programs:

- HP-UX 11.00
- HP-UX 11i V1
- HP-UX 11i V2 (PA-RISC)
- HP-UX 11i V2 (IPF)
- Solaris 8
- Solaris 9
- Solaris 10
- AIX 5L V5.1
- AIX 5L V5.2
- AIX 5L V5.3
- Red Hat Enterprise Linux AS 3(x86) 2.4.21-4.EL
- Red Hat Enterprise Linux ES 3(x86) 2.4.21-4.EL
- Red Hat Enterprise Linux AS 3(x86) 2.4.21-20.EL
- Red Hat Enterprise Linux ES 3(x86) 2.4.21-20.EL
- Red Hat Enterprise Linux AS 3(x86) 2.4.21-27.EL
- Red Hat Enterprise Linux ES 3(x86) 2.4.21-27.EL
- Red Hat Enterprise Linux AS 3(x86) 2.4.21-32.EL
- Red Hat Enterprise Linux ES 3(x86) 2.4.21-32.EL
- Red Hat Enterprise Linux AS 3(IPF) 2.4.21-4.EL
- Red Hat Enterprise Linux AS 3(IPF) 2.4.21-20.EL
- Red Hat Enterprise Linux AS 4(x64) 2.6.9-11.EL
- Red Hat Enterprise Linux ES 4(x64) 2.6.9-11.EL
- Red Hat Enterprise Linux AS 4(x86) 2.6.9-11.EL
- Red Hat Enterprise Linux ES 4(x86) 2.6.9-11.EL
- Red Hat Enterprise Linux AS 4(IPF) 2.6.9-11.EL

A.2.5 Agent for SAN Switch

Table A.3 and Table A.4 list the switches and their respective firmware versions that Agent for SAN Switch can monitor. Agent for SAN Switch cannot monitor fabrics containing unsupported switches. To monitor Brocade switches, Agent for SAN Switch uses API Brocade Fabric Access Version 3.2.1 (for Solaris 8 and AIX 5L V5.1) and API Brocade Fabric Access version 3.2.2 (for operating systems other than Solaris 8 and AIX 5L V5.1). To monitor McDATA switches, Agent for SAN Switch uses API C-FCSWAPI 02.03.01.

Table A.3 Supported Products (Brocade Switches)

Series Name	Product Name	Firmware Version (see *Note1*)
SilkWorm 2000 series	SilkWorm 2010 SilkWorm 2040 SilkWorm 2050 SilkWorm 2210 SilkWorm 2240 SilkWorm 2250 SilkWorm 2400 SilkWorm 2800	V2.6.1(*x*), V2.6.2(*x*)
SilkWorm 3000 series	SilkWorm 3014 (see *Note2*)	V5.0.1(*x*)
	SilkWorm 3200 SilkWorm 3800	V3.1.0(*x*), V3.1.1(*x*), V3.1.2(*x*), V3.1.3(*x*), V3.2.0(*x*)
	SilkWorm 3250 SilkWorm 3850	V4.2.0(*x*), V4.2.2(*x*), V4.4.0(*x*), V4.4.1(*x*), V4.4.2(*x*), V5.0.1(*x*), V5.0.3(*x*), V5.0.4(*x*), V5.0.5(*x*), V5.1.0(x)
	SilkWorm 3900	V4.1.0(*x*), V4.1.1(*x*), V4.1.2(*x*), V4.2.0(*x*), V4.2.2(*x*), V4.4.0(*x*), V4.4.1(*x*), V4.4.2(*x*), V5.0.1(*x*), V5.0.3(*x*) , V5.0.4(*x*), V5.0.5(*x*), V5.1.0(x)
SilkWorm 4000 series	SilkWorm 4100	V4.4.0(*x*), V4.4.1(*x*), V4.4.2(*x*), V5.0.1(*x*), V5.0.3(*x*) , V5.0.4(*x*), V5.0.5(*x*), V5.1.0(x)
	SilkWorm 4900 (see *Note3*)	V5.1.0(x)

–	SilkWorm 200E	V5.0.1(*x*), V5.0.3(*x*), V5.0.4(*x*), V5.0.5(*x*), V5.1.0(x)
	SilkWorm 12000 Director	V4.1.0(*x*), V4.1.1(*x*), V4.1.2(*x*), V4.2.0(*x*), V4.2.2(*x*), V4.4.0(*x*), V4.4.1(*x*), V4.4.2(*x*), V5.0.1(*x*), V5.0.3(*x*), V5.0.4(*x*), V5.0.5(*x*), V5.1.0(x)
	SilkWorm 24000 Director	V4.2.0(*x*), V4.2.2(*x*), V4.4.0(*x*), V4.4.1(*x*), V4.4.2(*x*), V5.0.1(*x*), V5.0.3(*x*), V5.0.4(*x*), V5.0.5(*x*), V5.1.0(x)
	SilkWorm 48000 Director	V5.0.1(*x*), V5.0.3(*x*), V5.0.4(*x*), V5.0.5(*x*), V5.1.0(x)

Note 1: The (*x*) at the end of the firmware version indicates a corrected version. When a corrected version is issued, we recommend that you upgrade to it. For information about the latest corrected version, contact Brocade Communications Systems, Inc.

Note 2: SilkWorm 3014 means the following switches:

- Fibre Channel switch with integrated BladeSymphony (entry type):

  GVX-BE9FCSW0EBX and GVX-BE9FCSW0E
- Fibre Channel switch with integrated BladeSymphony (full-fabric type):

  GVX-BE9FCSW0FBX and GVX-BE9FCSW0F

Note 3: To monitor SilkWorm 4900 on the Solaris host or the AIX host, Solaris 9 or later, or AIX 5L V5.2 or later is required.

Table A.4 Supported Products (McDATA Switches)

Series Name	Product Name	Firmware Version (see *Note1)*
Sphereon 3000 series	▪ Sphereon 3016 ▪ Sphereon 3032 ▪ Sphereon 3216 ▪ Sphereon 3232	V06.01.(*xx*), V06.02.(*xx*), V06.03.(*xx*), V07.00.(*xx*), V07.01.(*xx*), V08.00.(*xx*), V08.01.(*xx*), V08.02.(*xx*), V09.00.(*xx*)
Sphereon 4000 series	▪ Sphereon 4500	
Intrepid® 6000 series	▪ Intrepid 6064 Director ▪ Intrepid 6140 Director	V07.00.(*xx*), V07.01.(*xx*), V08.00.(*xx*), V08.01.(*xx*), V08.02.(*xx*), V09.00.(*xx*)
–	▪ Intrepid 10000 Director (see *Note2*)	V06.04.(*xx*), V06.05.(*xx*)

Note 1: The (*xx*) at the end of the firmware version indicates a corrected version. When a corrected version is issued, we recommend that you upgrade to it. For information about the latest corrected version, contact McDATA Corporation.

Note 2: If you are using the partitioning function provided by Intrepid 10000, Agent for SAN Switch recognizes one partition as one switch.

The following indicate the programs that are required for monitoring McDATA switches:

- EFCM 07.02.00 *x*(see *Note*), EFCM 08.05.00, EFCM 08.06.00, EFCM 08.07.00, EFCM 08.07.01, EFCM 08.08.00, EFCM 08.09.00, EFCM 08.09.01,or EFCM 09.00.00
- Bridge Agent

  For EFCM 07.02.00 *x*#, Bridge Agent 02.02.01 or later is required. For EFCM 08.05.00, EFCM 08.06.00, EFCM 08.07.00, EFCM 08.07.01, EFCM 08.08.00, EFCM 08.09.00, EFCM 08.09.01,or EFCM 09.00.00, Bridge Agent 02.03.00 or later is required. Note that the corresponding Bridge Agent version might change. For the latest information on the corresponding Bridge Agent versions, contact McDATA Corporation.

  Note: x indicates the EFCM build number. To use EFCM 07.02.00, this build number must be 8 or larger.

A.2.6 Agent for NAS

Agent for NAS can monitor NAS systems in the following storage subsystems:

- Lightning 9900V series
  - Lightning 9970V
  - Lightning 9980V
- TagmaStore AMS series
  - TagmaStore AMS200
  - TagmaStore AMS500
  - TagmaStore AMS1000
- TagmaStore WMS series
  - TagmaStore WMS100
- TagmaStore USP
  - TagmaStore USP100
  - TagmaStore USP600
  - TagmaStore USP1100
  - TagmaStore NSC55

The following program products are required in order to monitor the NAS system:

- When monitoring the NAS system that is configured on Lightning 9900V Series or TagmaStore USP:

  P-9P13-J8021E HITACHI Network Attached Storage/Management 02-01 or 02-02, or P-9P13-J8121E Network Attached Storage Blade Manager 03-00, 03-01, 03-02, 03-03, 03-04, or 03-05
- When monitoring the NAS system that is configured on TagmaStore AMS 200:

  P-9P13-J8D022E Network Attached Storage Manager Modular 04-00 or 04-01
- When monitoring the NAS system that is configured on TagmaStore AMS 500:

  P-9P13-J8D012E Network Attached Storage Manager Modular 04-00 or 04-01

- When monitoring the NAS system that is configured on TagmaStore AMS 1000:
  P-9P13-J8D002E Network Attached Storage Manager Modular 04-00 or 04-01
- When monitoring the NAS system that is configured on TagmaStore WMS 100:
  P-9P13-J8D032E Network Attached Storage Manager Modular 04-00 or 04-01

Note: The NAS system that is monitored is the one corresponding to the fixed IP address that was specified when the instance was set up. Also, NAS Manager must be installed on any NAS system to be monitored.

A.2.7 Agent for Oracle

Agent for Oracle can monitor the following programs.

For Windows

Table A.5 Supported Oracle Databases (Windows)

Oracle Database	Windows 2000	Windows Server 2003
Oracle8i Database Enterprise Edition R8.1.6 (PSR R8.1.6.3.8 or later)	Yes	No
Oracle8i Database Enterprise Edition R8.1.7 (PSR R8.1.7.1.1 or later)	Yes	No
Oracle9i Database Release 1 Enterprise Edition (PSR R9.0.1.1.1 or later)	Yes	No
Oracle9i Database Release 2 Enterprise Edition (R9.2.0.1.0 or later)	Yes	No
Oracle9i Database Release 2 Enterprise Edition (PSR R9.2.0.3.0 Patch 1 or later)	Yes	Yes
Oracle8i Workgroup Server R8.1.6 (PSR R8.1.6.3.8 or later)	Yes	No
Oracle8i Workgroup Server R8.1.7 (PSR R8.1.7.1.1 or later)	Yes	No
Oracle9i Database Release 1 Standard Edition (PSR R9.0.1.4.0 or later) (see *Note*)	Yes	No
Oracle9i Database Release 2 Standard Edition (R9.2.0.1.0 or later) (see *Note*)	Yes	No
Oracle9i Database Release 2 Standard Edition (PSR R9.2.0.3.0 Patch 1 or later)	Yes	Yes
Oracle Database 10g Release 1	Yes	Yes

(R10.1.0.2 or later)		
Oracle Database 10g Release 2 (R10.2.0.1 or later)	Yes	Yes

Note: Standard Edition One is included.

For HP-UX

Table A.6 Supported Oracle Databases (HP-UX)

Oracle Database	HP-UX 11.00 (32 bit)	HP-UX 11.00 (64 bit)	HP-UX 11i V1 (32 bit)	HP-UX 11i V1 (64 bit)	HP-UX 11i V2 (64 bit)	HP-UX 11i V2 (IPF)
Oracle8 Enterprise Edition R8.0.6 (PSR R8.0.6.3.0 or later)	Yes	Yes	No	No	No	No
Oracle8i Database Enterprise Edition R8.1.6 (PSR R8.1.6.3.0 or later)	Yes	Yes	Yes	Yes	No	No
Oracle8i Database Enterprise Edition R8.1.7 (PSR R8.1.7.4.0 or later)	Yes	Yes	Yes	Yes	No	No
Oracle9i Database Release 1 Enterprise Edition (PSR R9.0.1.4.0 or later)	No	Yes	No	Yes	No	No
Oracle9i Database Release 2 Enterprise Edition (R9.2.0.1.0 or later)	No	No	No	Yes	Yes	Yes
Oracle8 Workgroup Server R8.0.6 (PSR R8.0.6.3.0 or later)	Yes	No	No	No	No	No
Oracle8i Workgroup Server R8.1.6 (PSR R8.1.6.3.0 or later)	Yes	No	Yes	No	No	No
Oracle8i Workgroup Server R8.1.7 (PSR R8.1.7.4.0 or later)	Yes	No	Yes	No	No	No
Oracle9i Database Release 1 Standard Edition (PSR R9.0.1.4.0 or later) (see *Note*)	No	Yes	No	Yes	No	No
Oracle9i Database Release 2 Standard Edition (R9.2.0.1.0 or later) (see *Note*)	No	No	No	Yes	Yes	Yes
Oracle Database 10g Release 1	No	No	No	Yes	Yes	Yes

(R10.1.0.2 or later)						
Oracle Database 10g Release 2 (R10.2.0.1 or later)	No	No	No	Yes	Yes	Yes

Note: Standard Edition One is included.

For Solaris

Table A.7 Supported Oracle Databases (Solaris)

Oracle Database	Solaris 8 (32 bit)	Solaris 8 (64 bit)	Solaris 9 (32 bit)	Solaris 9 (64 bit)	Solaris 10 (64 bit)
Oracle8 Enterprise Edition R8.0.6 (PSR R8.0.6.3.0 or later)	Yes	No	No	No	No
Oracle8i Database Enterprise Edition R8.1.6 (PSR R8.1.6.3.0 or later)	Yes	Yes	Yes	Yes	No
Oracle8i Database Enterprise Edition R8.1.7 (PSR R8.1.7.4.0 or later)	Yes	Yes	Yes	Yes	No
Oracle9i Database Release 1 Enterprise Edition (PSR R9.0.1.4.0 or later)	Yes	Yes	Yes	Yes	No
Oracle9i Database Release 2 Enterprise Edition (R9.2.0.1.0 or later)	Yes	Yes	Yes	Yes	Yes
Oracle8 Workgroup Server R8.0.6 (PSR R8.0.6.3.0 or later)	Yes	No	No	No	No
Oracle8i Workgroup Server R8.1.6 (PSR R8.1.6.3.0 or later)	Yes	No	Yes	No	No
Oracle8i Workgroup Server R8.1.7 (PSR R8.1.7.4.0 or later)	Yes	No	Yes	No	No
Oracle9i Database Release 1 Standard Edition (PSR R9.0.1.4.0 or later) (see *Note*)	Yes	Yes	Yes	Yes	No
Oracle9i Database Release 2 Standard Edition (R9.2.0.1.0 or later) (see *Note*)	Yes	Yes	Yes	Yes	Yes
Oracle Database 10g Release 1 (R10.1.0.2	No	Yes	No	Yes	Yes

or later)					
Oracle Database 10g Release 2 (R10.2.0.1 or later)	No	Yes	No	Yes	Yes

Note: Standard Edition One is included.

For AIX

Table A.8 Supported Oracle Databases (AIX)

Oracle Database	AIX 5L V5.1 (32 bit)	AIX 5L V5.1 (64 bit)	AIX 5L V5.2 (32 bit)	AIX 5L V5.2 (64 bit)	AIX 5L V5.3 (64 bit)
Oracle8i Database Enterprise Edition R8.1.6 (PSR R8.1.6.3.0 or later)	Yes	No	No	No	No
Oracle8i Database Enterprise Edition R8.1.7 (PSR R8.1.7.4.0 or later)	Yes	No	No	No	No
Oracle9i Database Release 2 Enterprise Edition (R9.2.0.1.0 or later)	No	Yes	No	Yes	Yes
Oracle8i Workgroup Server R8.1.6 (PSR R8.1.6.3.0 or later)	Yes	No	No	No	No
Oracle8i Workgroup Server R8.1.7 (PSR R8.1.7.4.0 or later)	Yes	No	No	No	No
Oracle9i Database Release 2 Standard Edition (R9.2.0.1.0 or later) (see *Note*)#	No	Yes	No	Yes	Yes
Oracle Database 10g Release 1 (R10.1.0.2 or later)	No	No	No	Yes	Yes
Oracle Database 10g Release 2 (R10.2.0.1 or later)	No	No	No	Yes	Yes

Note: Standard Edition One is included.

A.2.8 Agent for Microsoft SQL Server

Agent for Microsoft SQL Server can monitor the following programs.

Monitoring in Windows 2000

- Microsoft SQL Server 2000, Enterprise Edition (Service Pack 2, Service Pack 3, Service Pack 3a)
- Microsoft SQL Server 2000, Standard Edition (Service Pack 2, Service Pack 3, Service Pack 3a)

Monitoring in Windows Server 2003

- Microsoft SQL Server 2000, Enterprise Edition (Service Pack 3, Service Pack 3a)
- Microsoft SQL Server 2000, Standard Edition (Service Pack 3, Service Pack 3a)
- Microsoft SQL Server 2005, Enterprise Edition
- Microsoft SQL Server 2005, Standard Edition

A.2.9 Agent for Microsoft Exchange Server

Agent for Microsoft Exchange Server can monitor the following programs:

- Microsoft Exchange Server 2003, Enterprise Edition (No Service Pack, Service Pack 1, Service Pack 2)
- Microsoft Exchange Server 2003, Standard Edition (No Service Pack, Service Pack 1, Service Pack 2)

A.2.10 Agent for DB2

Agent for DB2 can monitor the following programs:

- DB2 Universal Database Express Edition V8.1
- DB2 Universal Database Workgroup Server Edition V8.1
- DB2 Universal Database Workgroup Server Unlimited Edition V8.1
- DB2 Universal Database Enterprise Sever Edition V8.1
- DB2 Universal Database Express Edition V8.2
- DB2 Universal Database Workgroup Server Edition V8.2
- DB2 Universal Database Workgroup Server Unlimited Edition V8.2
- DB2 Universal Database Enterprise Server Edition V8.2

A.3 Prerequisite Software

The following programs need to be installed to run Tuning Manager version 5.5:

- Agent for RAID 3.0 or later

  This program is required to monitor storage subsystems.

- HTM Agent 3.0 or later

  This program is required to monitor information about servers connected to storage.

To manage an Agent, Tuning Manager version 5.5 or later must be installed in the system of the Tuning Manager series.

A.4 Prerequisite Software for Specific Functions

This section describes software that is required when using specific functions of Tuning Manager or Agents.

A.4.1 SMTP Server

The SMTP server is necessary for sending email, such as when an alarm event occurs and the system administrator is notified of that event by email. For details, see the *HiCommand Tuning Manager Agent Administration Guide*.

A.4.2 Cluster Software

The following tables show the cluster software supported by Tuning Manager and Agents.

Yes in the following tables indicates that the cluster software is supported. **No** indicates that the cluster software is not supported. **N/A** indicates that both Tuning Manager and the Agent do not support that OS.

For Windows

Table A.9 Cluster Software (Windows)

OS	Cluster Software	Tuning Manager	Agent for RAID	HTM Agent	Agent for SAN Switch	Agent for NAS	Agent for Oracle.	Agent for Microsoft SQL Server	Agent for DB2
Windows 2000	MSCS	No	Yes	Yes (see *Note 1*)	Yes	Yes	Yes	Yes	N/A
Windows Server 2003 (x86)	MSCS	Yes	Yes	Yes	Yes (see *Note 2*)	Yes	Yes	Yes	N/A
Windows Server 2003 (x64)	MSCS	N/A	Yes	Yes (see *Note 1*)	N/A	No	N/A	N/A	N/A
Windows Server 2003 (IPF)	MSCS	N/A	N/A	Yes (see *Note 1*)	N/A	N/A	N/A	N/A	N/A

Note 1: Agent for Microsoft Exchange Server does not support the cluster software.

Note 2: McDATA switches are not supported.

For HP-UX

Table A.10 Cluster Software (HP-UX)

OS	Cluster Software	Tuning Manager	Agent for RAID	HTM Agent	Agent for SAN Switch	Agent for NAS	Agent for Oracle.	Agent for Microsoft SQL Server	Agent for DB2
HP-UX 11.00	MC/SG 11.13	N/A	Yes	Yes	Yes	Yes	Yes	N/A	N/A
	MC/SG 11.14	N/A	Yes	Yes	Yes	Yes	Yes	N/A	N/A
	MC/SG 11.15	N/A	Yes	Yes	No	No	No	N/A	N/A
	MC/SG 11.16	N/A	Yes	Yes	Yes	Yes	Yes	N/A	N/A
	HA Monitor	N/A	Yes	Yes	No	No	N/A	N/A	N/A
HP-UX 11i V1	MC/SG 11.13	N/A	Yes	Yes	Yes	Yes	Yes	N/A	N/A
	MC/SG 11.14	N/A	Yes	Yes	Yes	Yes	Yes	N/A	N/A
	MC/SG 11.15	N/A	Yes	Yes	No	No	No	N/A	N/A
	MC/SG 11.16	N/A	Yes	Yes	Yes	Yes	Yes	N/A	N/A
	HA Monitor	N/A	Yes	Yes	No	No	N/A	N/A	N/A
HP-UX 11i V2 (PA-RISC)	MC/SG 11.13	N/A	No	No	N/A	No	No	N/A	N/A
	MC/SG 11.14	N/A	No	No	N/A	No	No	N/A	N/A
	MC/SG 11.16	N/A	Yes	Yes	N/A	Yes	No	N/A	N/A
HP-UX 11i V2 (IPF)	MC/SG 11.16	N/A	No	Yes	N/A	N/A	No	N/A	N/A

For Solaris

Table A.11 Cluster Software (Solaris)

OS	Cluster Software	Tuning Manager	Agent for RAID	HTM Agent	Agent for SAN Switch	Agent for NAS	Agent for Oracle	Agent for Microsoft SQL Server	Agent for DB2
Solaris 8	SunCluster 3.1	No	Yes	Yes	Yes	Yes	No	N/A	N/A
	VCS 3.5	No	Yes	Yes	Yes	Yes	No	N/A	N/A
	VCS 4.0	No	No	No	No	No	No	N/A	N/A
	Cluster Perfect 4.5R2	No	No	No	No	No	No	N/A	N/A
Solaris 9	SunCluster 3.1	Yes	Yes	Yes	Yes	Yes	No	N/A	N/A
	VCS 2.0	No	No	No	No	No	No	N/A	N/A
	VCS 3.5	No	Yes	Yes	Yes	Yes	No	N/A	N/A
	VCS 4.0	Yes	Yes	Yes	Yes	Yes	No	N/A	N/A
	VCS 4.1	No	Yes	Yes	Yes	Yes	Yes	N/A	N/A
	Cluster Perfect 4.5R2	No	Yes	Yes	No	No	No	N/A	N/A
	PRIME CLUSTER	No	Yes	Yes (see *Note 1*)	No	No	No	N/A	N/A
Solaris 10	SunCluster 3.1	No	No	No	No	No	No	N/A	N/A
Solaris 10	VCS 2.0	No	No	No	No	No	No	N/A	N/A
	VCS 3.5	No	No	No	No	No	No	N/A	N/A
	VCS 4.1	No	Yes	Yes	Yes (see *Note 2*)	No	Yes	N/A	N/A
	Cluster Perfect 4.5R2	No	No	No	No	No	No	N/A	N/A

Note 1: PRIMECLUSTER GDS is not supported.

Note 2: McDATA switches are not supported.

For AIX

Table A.12 Cluster Software (AIX)

OS	Cluster Software	Tuning Manager	Agent for RAID	HTM Agent	Agent for SAN Switch	Agent for NAS	Agent for Oracle	Agent for Microsoft SQL Server	Agent for DB2
AIX 5L V5.1	HACMP 4.4.1	N/A	Yes	No	No	Yes	Yes	N/A	No
	HACMP 4.5	N/A	Yes	Yes	Yes	Yes	Yes	N/A	No
	HACMP 5.1	N/A	Yes	Yes	Yes	Yes	Yes	N/A	No
	HACMP 5.2	N/A	Yes	Yes	No	No	No	N/A	No
	HA Monitor	N/A	Yes	Yes	No	No	No	N/A	No
AIX 5L V5.2	HACMP 4.4.1	N/A	No	No	No	No	Yes	N/A	No
	HACMP 4.5	N/A	No	Yes	Yes (see *Note*)	Yes	Yes	N/A	No
	HACMP 5.1	N/A	Yes	Yes	Yes (see *Note*)	Yes	Yes	N/A	Yes
	HACMP 5.2	N/A	Yes	Yes	Yes (see *Note*)	Yes	No	N/A	No
	HA Monitor	N/A	Yes	Yes	No	No	No	N/A	No
AIX 5L V5.3	HACMP 5.1	N/A	No	No	No	Yes	No	N/A	No
	HACMP 5.2	N/A	Yes	Yes	Yes (see *Note*)	Yes	No	N/A	Yes
	HACMP 5.3	N/A	Yes	Yes	Yes (see *Note*)	Yes	Yes	N/A	Yes

Note: McDATA switches are not supported.

For Linux

Table A.13 Cluster Software (Linux)

OS	Cluster Software	Tuning Manager	Agent for RAID	HTM Agent	Agent for SAN Switch	Agent for NAS	Agent for Oracle.	Agent for Microsoft SQL Server	Agent for DB2
Linux 3	VCS 2.2	N/A	N/A	Yes	N/A	N/A	N/A	N/A	No
Linux AS 3 (IPF)	VCS 2.2	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A
Linux 4	VCS 4.1	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A
Linux AS 4 (IPF)	VCS 4.1	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A

A.4.3 Volume Manager

Agent for RAID Map supports monitoring of volumes in a storage resource that is configured by the following volume management programs:

- VERITAS Volume Manager
- Logical Volume Manager
- Logical Volume Manager 2
- Solstice DiskSuite
- Solaris Volume Manager

The following table shows the correspondence between the volume management programs supported by Agent for RAID Map and the applicable OSs.

Table A.14 Correspondence Between Volume Management Programs Supported by Agent for RAID Map and Applicable OSs

Applicable OS	Volume Management Program	Version (see *Note*)
Windows 2000	VERITAS Volume Manager	2.7 or 3.0
Windows Server 2003	Not supported	N/A
Windows Server 2003 (IPF)	Not supported	N/A
HP-UX 11.00	Logical Volume Manager	--
HP-UX 11i V1	Logical Volume Manager	--
HP-UX 11i V2 (PA-RISC)	Logical Volume Manager	--
HP-UX 11i V2 (IPF)	Logical Volume Manager	--

Solaris 8	VERITAS Volume Manager	3.1.1, 3.2, 3.5, 4.0 or 4.1
	Solstice DiskSuite	--
Solaris 9	VERITAS Volume Manager	3.2, 3.5, 4.0 or 4.1
	Solaris Volume Manager	--
Solaris 10	VERITAS Volume Manager	4.1
	Solaris Volume Manager	--
AIX 5L V5.1	Logical Volume Manager	--
	VERITAS Volume Manager	3.5 or 4.0
AIX 5L V5.2	Logical Volume Manager	--
	VERITAS Volume Manager	3.5 or 4.0
AIX 5L V5.3	Logical Volume Manager	--
	VERITAS Volume Manager	4.0
Linux 3	Logical Volume Manager	1.0.3-15, 1.0.8-9 or 1.0.8-12.2
Linux AS 3 (IPF)	Logical Volume Manager	1.0.3-15
Linux 4	Logical Volume Manager 2	2.0.1.08
Linux AS 4 (IPF)	Logical Volume Manager 2	2.0.1.08

Note: **--** indicates that Agent for RAID Map does not depend on the version numbers.

A.4.4 Multi-Path

Agent for RAID Map supports monitoring of a multi-path environment that is configured by the following path management programs. When Agent for RAID Map is installed in a Windows host, performance information that is grouped for a single path is collected rather than performance information for each path, even when a path management program is used to distribute the processing load.

- Hitachi Dynamic Link Manager (see *Note*)
- VERITAS Volume Manager (Dynamic Multi-Pathing)
- Logical Volume Manager (PV-Link)

Note: The product name for Version 05-80 or later is HiCommand Dynamic Link Manager.

Table A.15 shows the correspondence between the path management programs supported by Agent for RAID Map and the applicable OSs.

Table A.15 Correspondence Between Path Management Programs Supported by Agent for RAID Map and Applicable OSs

Applicable OS	Path Management Program	Version
Windows 2000	Hitachi Dynamic Link Manager	04-00 - 05-60
	HiCommand Dynamic Link Manager	05-80
	VERITAS Volume Manager (Dynamic Multi Pathing)	2.7 or 3.0
Windows Server 2003	Hitachi Dynamic Link Manager	05-01 - 05-60
	HiCommand Dynamic Link Manager	05-80
Windows Server 2003 (IPF)	Hitachi Dynamic Link Manager	05-40 - 05-60
	HiCommand Dynamic Link Manager	05-80
HP-UX 11.00	Hitachi Dynamic Link Manager	04-00 - 05-60
	HiCommand Dynamic Link Manager	05-80
	Logical Volume Manager (PV-Link)	–
HP-UX 11i V1	Hitachi Dynamic Link Manager	04-00 - 05-60
	HiCommand Dynamic Link Manager	05-80
	Logical Volume Manager (PV-Link)	–
HP-UX 11i V2 (PA-RISC)	HiCommand Dynamic Link Manager	05-80
	Logical Volume Manager (PV-Link)	–
HP-UX 11i V2 (IPF)	Hitachi Dynamic Link Manager	05-60
	HiCommand Dynamic Link Manager	05-80
	Logical Volume Manager (PV-Link)	–
Solaris 8	Hitachi Dynamic Link Manager	04-00-/A - 05-60
	HiCommand Dynamic Link Manager	05-80
	VERITAS Volume Manager (Dynamic Multi Pathing)	3.2, 3.5, 4.0 or 4.1
Solaris 9	Hitachi Dynamic Link Manager	04-01 - 05-60
	HiCommand Dynamic Link Manager	05-80
	VERITAS Volume Manager (Dynamic Multi Pathing)	3.2, 3.5, 4.0 or 4.1
Solaris 10	HiCommand Dynamic Link Manager	05-80
Solaris 10	VERITAS Volume Manager (Dynamic Multi Pathing)	4.1
AIX 5L V5.1	Hitachi Dynamic Link Manager	04-00-/E - 05-60
	HiCommand Dynamic Link Manager	05-80
	VERITAS Volume Manager (Dynamic Multi Pathing)	3.5
AIX 5L V5.2	Hitachi Dynamic Link Manager	04-00-/E - 05-60
	HiCommand Dynamic Link Manager	05-80
	VERITAS Volume Manager (Dynamic Multi Pathing)	3.5 or 4.0

AIX 5L V5.3	Hitachi Dynamic Link Manager	05-60
	HiCommand Dynamic Link Manager	05-80
	VERITAS Volume Manager (Dynamic Multi Pathing)	4.0
Linux 3	Hitachi Dynamic Link Manager	05-42 - 05-60
	HiCommand Dynamic Link Manager	05-80
Linux AS 3 (IPF)	Hitachi Dynamic Link Manager	05-61
	HiCommand Dynamic Link Manager	05-80
Linux 4	HiCommand Dynamic Link Manager	05-80
Linux AS 4 (IPF)	HiCommand Dynamic Link Manager	05-80

A.5 Required Patches

This section describes the OS patches required for the Agent operation.

Yes in the following tables indicates that the patch must be applied to the OS. **No** indicates that the patch does not have to be applied. **N/A** indicates that the Agent does not support that OS.

A.5.1 Patches Required for Agent Operation

For HP-UX 11.00

The following patches or succeeding versions of these patches must be applied to the OS. The patches can be downloaded from the following Hewlett-Packard® Company Web site:

URL: http://us-support.external.hp.com/ (IT Resource Center)

Note that these patches might be changed or integrated into succeeding versions of these patches. In such a case, use the following patch number to search for the succeeding version of the patch.

Table A.16 Patches Required for Agent Operation on HP-UX 11.00

Patch Number	Description	Agent for RAID	HTM Agent	Agent for SAN Switch	Agent for NAS	Agent for Oracle	Agent for Micros oft SQL Server	Agent for DB2
PHCO_21187	cumulative SAM/ObAM patch	Yes	Yes	Yes	Yes	No	N/A	N/A
PHCO_23963	libc cumulative header file patch	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHCO_25342	Kernel configuration commands patch	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHCO_25707	libc cumulative patch	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHCO_26000	Pthread library cumulative patch	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHKL_18543	PM/VM/UFS/async/scsi/ io/DMAPI/JFS/perf patch	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHKL_22677	fix of getdirentries, MVFS, rcp, mmap & IDS	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHKL_23409	NFS, Large Data Space, kernel memory leak	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHKL_25906	Probe,IDDS,PM,VM,PA	Yes	Yes	Yes	Yes	Yes	N/A	N/A

	-8700,asyncio,T600,FS							
PHKL_26059	syscall, signal, umask cumulative patch	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHKL_28003	sar shows incorrect values for avwait, avque	Yes	Yes	Yes	No	No	N/A	N/A
PHNE_23003	r-commands cumulative patch	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHNE_24909	ONC/NFS General Release/Performance Patch	No	No	Yes	No	Yes	N/A	N/A
PHNE_25423	cumulative ARPA Transport patch	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHNE_26387	ONC/NFS General Release/Performance Patch	Yes	Yes	No	Yes	Yes	N/A	N/A
PHSS_24303	ld(1) and linker tools cumulative patch	No	No	No	No	Yes	N/A	N/A
PHSS_24627	aC++ -AA runtime libraries (aCC A.03.33)	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHSS_26262	ld(1) and linker tools cumulative patch	Yes	Yes	Yes	Yes	No	N/A	N/A
EMS-Config, EMS-Core, Predictive, Sup-Tool-Mgr-800, or other products from /cdrom/DIAGNOSTICS/B.11.0#1		No	No	No	No	Yes	N/A	N/A
General Release (GR) Bundle - XSWGR1100#1		No	No	No	No	Yes	N/A	N/A
Hardware/Critical (HWCR) Bundle: XSWHWCR1100#1		No	No	No	No	Yes	N/A	N/A
OnlineDiag bundle (from /cdrom/DIAGNOSTICS directory) (see *Note*)		No	No	No	No	Yes	N/A	N/A

Note: Make sure that the patches contained in HP-UX Support Plus CD-ROM for release 11.0 (December 2000 or later) are applied.

For HP-UX 11i V1

The following patches or succeeding versions of these patches must be applied to the OS. The patches can be downloaded from the following Hewlett-Packard Company Web site:

URL: http://us-support.external.hp.com/ (IT Resource Center)

Note that these patches might be changed or integrated into succeeding versions of these patches. In such a case, use the following patch number to search for the succeeding version of the patch.

Table A.17 Patches Required for Agent Operation on HP-UX 11i V1

Patch Number	Description	Agent for RAID	HTM Agent	Agent for SAN Switch	Agent for NAS	Agent for Oracle	Agent for Micros oft SQL Server	Agent for DB2
PHCO_24402	libc cumulative header file patch	No	No	No	No	Yes	N/A	N/A
PHCO_24777	mountall cumulative patch	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHCO_25452	libc cumulative patch	No	No	Yes	No	Yes	N/A	N/A
PHCO_26124	libc cumulative patch	Yes	Yes	No	Yes	Yes	N/A	N/A
PHKL_24255	thread nostop patch supporting NFS	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHKL_24569	Thread NOSTOP, Psets Enablement	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHKL_24751	preserve IPSW W-bit and GR31 lower bits	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHKL_25729	signals,threads enhancement,Psets Enablement	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHKL_25840	Thread NOSTOP, Psets,Thread Abort	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHKL_27091	Core PM, vPar, Psets Cumulative Patch	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHKL_27200	sar shows incorrect values for avwait, avque	Yes	No	Yes	Yes	No	N/A	N/A
PHKL_30515	'sar -d' reports inaccurate data	No	Yes	No	No	No	N/A	N/A
PHNE_26388	ONC/NFS General Release/Performanc e Patch	Yes	Yes	Yes	Yes	Yes	N/A	N/A
PHSS_26263	ld(1) and linker tools cumulative patch	No	No	No	No	Yes	N/A	N/A
PHSS_26560	ld(1) and linker tools cumulative patch	Yes	No	Yes	Yes	No	N/A	N/A

For HP-UX 11i V2 (PA-RISC)

The following patches or succeeding versions of these patches must be applied to the OS. The patches can be downloaded from the Hewlett-Packard Company Web site.

URL: http://us-support.external.hp.com/ (IT Resource Center)

Note that these patches might be changed or integrated into succeeding versions of these patches. In such a case, use the following patch number to search for the succeeding version of the patch.

Table A.18 Patches Required for Agent Operation on HP-UX 11i V2 (PA-RISC)

Patch Number and Description	Agent for RAID	HTM Agent	Agent for SAN Switch	Agent for NAS	Agent for Oracle	Agent for Micros oft SQL Server	Agent for DB2
BUNDLE11i B.11.23.0409.3 Required Patch Bundle for HP-UX 11i v2 (B.11.23), September 2004	No	Yes	N/A	No	No	N/A	N/A
PHKL_32478 Fix for incorrect behavior in pstat_getdisk	No	Yes	N/A	No	No	N/A	N/A

For HP-UX 11i V2 (IPF)

The following patches or succeeding versions of these patches must be applied to the OS. The patches can be downloaded from the following Hewlett-Packard Company Web site.

URL: http://us-support.external.hp.com/ (IT Resource Center)

Note that these patches might be changed or integrated into succeeding versions of these patches. In such a case, use the following patch number to search for the succeeding version of the patch.

Table A.19 Patches Required for Agent Operation on HP-UX 11i V2 (IPF)

Patch Number	Description	Agent for RAID	HTM Agent	Agent for SAN Switch	Agent for NAS	Agent for Oracle	Agent for Microso ft SQL Server	Agent for DB2
PHCO_29957	libc cumulative patch	No	Yes	N/A	N/A	N/A	N/A	N/A

For AIX 5L V5.1

The following file sets or the succeeding versions of these file sets must be applied to the OS. The file sets can be downloaded from the following IBM® Web site.

URL: http://www.ibm.com/support/us/

Table A.20 File Sets Required for Agent Operation on AIX 5L V5.1

File Set Name	Agent for RAID	HTM Agent	Agent for SAN Switch	Agent for NAS	Agent for Oracle	Agent for Microsoft SQL Server	Agent for DB2
AIX 5100-02 Recommended Maintenance Package	Yes	Yes	Yes	Yes	Yes	N/A	Yes
bos.net.tcp.client 5.1.0.35 TCP/IP Client Support	No	Yes	No	No	No	N/A	No
bos.rte.libc 5.1.0.35 libc Library	No	Yes	No	No	No	N/A	No
bos.rte.libcfg 5.1.0.35 libcfg Library	No	Yes	No	No	No	N/A	No
bos.rte.libpthreads 5.1.0.35 libpthreads Library	No	Yes	No	No	No	N/A	No
bos.rte.odm 5.1.0.25 Object Data Manager	No	Yes	No	No	No	N/A	No
xlC.aix50.rte 6.0.0.1 C Set ++ Runtime for AIX 5.0	No	No	Yes	No	No	N/A	No
xlC.aix50.rte 6.0.0.2 C Set ++ Runtime for AIX 5.0	Yes	Yes	No	Yes	No	N/A	Yes
xlC.rte 6.0.0.0 C Set ++ Runtime	Yes	Yes	Yes	Yes	No	N/A	Yes

For AIX 5L V5.2

The following file sets or the succeeding versions of these file sets must be applied to the OS. The file sets can be downloaded from the following IBM Web site.

URL: http://www.ibm.com/support/us/

Table A.21 File Sets Required for Agent Operation on AIX 5L V5.2

File Set Name	Agent for RAID	HTM Agent	Agent for SAN Switch	Agent for NAS	Agent for Oracle	Agent for Microsoft SQL Server	Agent for DB2
xlC.aix50.rte 6.0.0.1 C Set ++ Runtime for AIX 5.0	No	No	Yes	No	No	N/A	No
xlC.aix50.rte 6.0.0.2 C Set ++ Runtime for AIX 5.0	Yes	Yes	No	Yes	No	N/A	Yes
xlC.rte 6.0.0.0 C Set ++ Runtime	Yes	Yes	Yes	Yes	No	N/A	Yes

For AIX 5L V5.3

The following file sets or the succeeding versions of these file sets must be applied to the OS. The file sets can be downloaded from the following IBM Web site.

URL: http://www-03.ibm.com/servers/eserver/support/unixservers/aixfixes.html

Table A.22 File Sets Required for Agent Operation on AIX 5L V5.3

File Set Name	Agent for RAID	HTM Agent	Agent for SAN Switch	Agent for NAS	Agent for Oracle	Agent for Microsoft SQL Server	Agent for DB2
bos.adt.include 5.3.0.3 Base Application Development Include Files	No	No	Yes	Yes	Yes	N/A	No
bos.mp 5.3.0.3 Base Operating System Multiprocessor Runtime	No	No	Yes	Yes	Yes	N/A	No
bos.mp64 5.3.0.3 Base Operating System 64-bit Multiprocessor Runtime	No	No	Yes	Yes	Yes	N/A	No
bos.net.ewlm.rte 5.3.0.1 netWLM	No	No	Yes	Yes	Yes	N/A	No
bos.net.ipsec.rte 5.3.0.1 IP Security	No	No	Yes	Yes	Yes	N/A	No
bos.net.mobip6.rte 5.3.0.1 IPv6 Mobility	No	No	Yes	Yes	Yes	N/A	No
bos.net.nfs.client 5.3.0.2 Network File System Client	No	No	Yes	Yes	Yes	N/A	No
bos.net.ppp 5.3.0.1 Async Point to Point Protocol	No	No	Yes	Yes	Yes	N/A	No
bos.net.sctp 5.3.0.1 Stream Control Transmission Protocol	No	No	Yes	Yes	Yes	N/A	No
bos.net.tcp.client 5.3.0.2 TCP/IP Client Support	No	No	Yes	Yes	Yes	N/A	No
bos.net.tcp.server 5.3.0.1 TCP/IP Server	No	No	Yes	Yes	Yes	N/A	No
bos.sysmgt.serv_aid 5.3.0.2 Software Error Logging and Dump Service Aids	No	No	Yes	Yes	Yes	N/A	No
devices.common.IBM.atm.rte 5.3.0.2 Common ATM Software	No	No	Yes	Yes	Yes	N/A	No
devices.common.IBM.ethernet.rte 5.3.0.2 Common Ethernet Software	No	No	Yes	Yes	Yes	N/A	No
devices.common.IBM.fc.rte 5.3.0.1 Common IBM FC Software	No	No	Yes	Yes	Yes	N/A	No
X11.base.rte 5.3.0.1 AIXwindows Runtime Environment	No	No	Yes	Yes	Yes	N/A	No

For Linux 4

The following RPM (Red Hat Package Manager) packages or succeeding versions of these RPM packages must be applied to the OS. Note that you can check the installed RPM package by executing the following command:

```
/bin/rpm -qa
```

Table A.23 RPM Packages Required for Agent Operation on Linux 4

RPM Package	Agent for RAID	HTM Agent	Agent for SAN Switch	Agent for NAS	Agent for Oracle	Agent for Microsoft SQL Server	Agent for DB2
compat-glibc-2.3.2-95.30.i386.rpm	N/A	Yes	N/A	N/A	N/A	N/A	N/A
compat-libstdc++-33-3.2.3-47.3.i386.rpm	N/A	Yes	N/A	N/A	N/A	N/A	N/A
ncompress-4.2.4-40.i386.rpm or ncompress-4.2.4-40.x86_64.rpm	N/A	Yes (see *Notes*)	N/A	N/A	N/A	N/A	N/A

Notes:

- For Red Hat Enterprise Linux AS 4(x86) 2.6.9-11.EL or Red Hat Enterprise Linux ES 4(x86) 2.6.9-11.EL, ncompress-4.2.4-40.i386.rpm is required.
- For Red Hat Enterprise Linux AS 4(x64) 2.6.9-11.EL or Red Hat Enterprise Linux ES 4(x64) 2.6.9-11.EL, ncompress-4.2.4-40.x86_64.rpm is required.

For Linux AS 4 (IPF)

The following RPM packages or succeeding versions of these RPM packages must be applied to the OS. Note that you can check the installed RPM package by executing the following command:

```
/bin/rpm -qa
```

Table A.24 RPM Packages Required for Agent Operation on Linux AS 4 (IPF)

RPM Package	Agent for RAID	HTM Agent	Agent for SAN Switch	Agent for NAS	Agent for Oracle	Agent for Microsoft SQL Server	Agent for DB2
compat-glibc-2.3.2-95.30.ia64.rpm	N/A	Yes	N/A	N/A	N/A	N/A	N/A
compat-libstdc++-33-3.2.3-47.3.ia64.rpm	N/A	Yes	N/A	N/A	N/A	N/A	N/A
ncompress-4.2.4-40.ia64.rpm	N/A	Yes	N/A	N/A	N/A	N/A	N/A

A.5.2 Patches Required When Collecting a Specific Record

For Agent for Platform (UNIX), some patches must be applied for some records to be collected. The following shows patches required when collecting a specific record, for each OS:

For HP-UX 11.00

The following shows patches and file sets required when collecting a specific record on HP-UX 11.00.

Table A.25 Patches Required When Collecting a Specific Record on HP-UX 11.00

Record Name (Record ID)	Patch Number	Description
Network Interface Detail (PI_NIND)	PHNE_29530 (see *Note*)	LAN product cumulative patch
Network Interface Summary (PI_NINS)		
Quotas (PD_UFSQ)	PHCO_29633	libc cumulative patch

Note: If the result displayed after executing the `lanadmin` command, entering `lan` in the `Test Selection Mode` menu, and then entering `display` in the `LAN Interface Test Mode` menu on HP-UX 11.00 is the same as the following, apply this patch. If this patch is not applied, the performance data of the relevant network interface cannot be collected from the Network Interface Detail (PI_NIND) record and Network Interface Summary (PI_NINS) record.

The display result of the `lanadmin` command execution:

```
Administration Status (value) = up(1)
Operation Status (value)  = down(2)
```

When collecting the User File System Storage (PD_UFSS) record on HP-UX 11.00, the following file set is required:

- Accounting

For HP-UX 11i V1

When collecting the Network Interface Detail (PI_NIND) record and Network Interface Summary (PI_NINS) record on HP-UX 11i V1, the following patch is required:

- PHNE_23465 100BT unified driver cumulative patch

When collecting the User File System Storage (PD_UFSS) record on HP-UX 11i V1, the following file set is required:

- Accounting

For HP-UX 11i V2 (PA-RISC) and HP-UX 11i V2 (IPF)

When collecting the User File System Storage (PD_UFSS) record on HP-UX 11i V2 (PA-RISC) or HP-UX 11i V2 (IPF), the following file set is required:

- Accounting

For Solaris 8, Solaris 9, and Solaris 10

When collecting the User File System Storage (PD_UFSS) record on Solaris 8, Solaris 9, or Solaris 10, the following option packages are required:

- System SUNWaccr System Accounting,(Root)
- System SUNWaccr System Accounting,(Usr)

For AIX 5L V5.1

When collecting the User File System Storage (PD_UFSS) record on AIX 5L V5.1, the following file set is required:

- bos.acct

For AIX 5L V5.2

The following table shows file sets required when collecting a specific record on AIX 5L V5.2.

Table A.26 File Sets Required When Collecting a Specific Record on AIX 5L V5.2

Record Name (Record ID)	File Set Name
Logged Messages (PL_MESS)	bos.rte.libc 5.2.0.13 libc Library (see *Note 1*)
	bos.adt.prof 5.2.0.13 Base Profiling Support (see *Note 2*)
User File System Storage (PD_UFSS)	bos.acct

Note 1: After applying this file set, execute the following command to make sure that all the file sets required for APAR IY46086 are applied:

```
instfix -ik IY46086
```

If the required file sets are applied, the result of the command execution is as follows:

```
All file sets are found for IY46086.
```

If the required file sets are not applied, the result of the command execution is as follows:

```
There is no data for IY46086 in fix-database.
```

Note 2: If all the file sets required for APAR IY46086 are not applied, apply this file set. Note that this file set does not support the DLPAR function.

For AIX 5L V5.3

The following table shows file sets required when collecting a specific record on AIX 5L V5.3.

Table A.27 File Sets Required When Collecting a Specific Record on AIX 5L V5.3

Record Name (Record ID)	File Set Name
Network Interface Detail (PI_NIND) or	bos.adt.include 5.3.0.3 Base Application Development Include Files
Network Interface Summary (PI_NINS)	bos.mp 5.3.0.3 Base Operating System Multiprocessor Runtime
	bos.mp64 5.3.0.3 Base Operating System 64-bit Multiprocessor Runtime
	bos.net.ewlm.rte 5.3.0.1 netWLM
Network Interface Summary (PI_NINS)	bos.net.ipsec.rte 5.3.0.1 IP Security
	bos.net.mobip6.rte 5.3.0.1 IPv6 Mobility
	bos.net.nfs.client 5.3.0.2 Network File System Client
	bos.net.nfs.server 5.3.0.1 Network File System Server
	bos.net.ppp 5.3.0.1 Async Point to Point Protocol
	bos.net.sctp 5.3.0.1 Stream Control Transmission Protocol
	bos.net.tcp.client 5.3.0.2 TCP/IP Client Support
	bos.net.tcp.server 5.3.0.1 TCP/IP Server
	bos.sysmgt.serv_aid 5.3.0.2 Software Error Logging and Dump Service Aids
	devices.common.IBM.atm.rte 5.3.0.2 Common ATM Software
	devices.common.IBM.ethernet.rte 5.3.0.2 Common Ethernet Software
	devices.common.IBM.fc.rte 5.3.0.1 Common IBM FC Software
	X11.base.rte 5.3.0.1 AIXwindows Runtime Environment
System Summary Overview (PI)	bos.perf.libperfstat 5.3.0.0 Performance Statistics Library
	bos.perf.perfstat 5.3.0.0 Performance Statistics
User File System Storage (PD_UFSS)	bos.acct

For Linux 3

The following table shows the RPM packages required when collecting a specific record on Linux 3. Note that you can check the installed RPM package by executing the following command:

```
/bin/rpm -qa
```

Table A.28 RPM Packages Required When Collecting a Specific Record on Linux 3

Record Name (Record ID)	RPM Package
CPU - Per Processor Detail (PI_CPUP)	kernel-smp-2.4.21-4.EL.athlon or kernel-smp-2.4.21-4.EL.i686 (see *Note*)
Device Detail (PI_DEVD)	MAKEDEV-3.3.8-1
Device Summary (PI_DEVS)	
File System Detail- Local (PD_FSL)	filesystem-2.2.1-3
File System Detail - Remote (PD_FSR)	
Network Interface Detail (PI_NIND)	net-tools-1.60-20
Network Interface Summary (PI_NINS)	
Process Detail (PD)	psacct-6.3.2-27
Process Detail Interval (PD_PDI)	psacct-6.3.2-27
Workgroup Summary (PI_WGRP)	
System Summary Overview (PI)	net-snmp-5.0.8-11
User File System Storage (PD_UFSS)	coreutils-4.5.3-26

Note: If the system adopts SMP (Symmetric Multi Processor) by the AMD processor, kernel-smp-2.4.21-4.EL.athlon is required. If the system adopts SMP by the Intel processor, kernel-smp-2.4.21-4.EL.i686 is required.

For Linux AS 3 (IPF)

The following table shows the RPM packages required when collecting a specific record on Linux AS 3 (IPF). Note that you can check the installed RPM package by executing the following command:

```
/bin/rpm -qa
```

Table A.29 RPM Packages Required When Collecting a Specific Record on Linux AS 3 (IPF)

Record Name (Record ID)	RPM Package
Device Detail (PI_DEVD)	MAKEDEV-3.3.8-1
Device Summary (PI_DEVS)	

File System Detail - Local (PD_FSL)	filesystem-2.2.1-3
File System Detail - Remote (PD_FSR)	
Network Interface Detail (PI_NIND)	net-tools-1.60-20
Network Interface Summary (PI_NINS)	
Process Detail (PD)	psacct-6.3.2-27
Process Detail Interval (PD_PDI)	
Workgroup Summary (PI_WGRP)	
System Summary Overview (PI)	net-snmp-5.0.8-11
User File System Storage (PD_UFSS)	coreutils-4.5.3-26

For Linux 4

The following table shows the RPM packages required when collecting a specific record on Linux 4. Note that you can check the installed RPM package by executing the following command:

```
/bin/rpm -qa
```

Table A.30 RPM Packages Required When Collecting a Specific Record on Linux 4

Record Name (Record ID)	RPM Package
CPU - Per Processor Detail (PI_CPUP)	kernel-smp-2.6.9-5.EL.athlon or kernel-smp-2.6.9-5.EL.i686 (see *Note*)
Device Detail (PI_DEVD)	MAKEDEV-3.15-2
Device Summary (PI_DEVS)	
File System Detail- Local (PD_FSL)	filesystem-2.3.0-1
File System Detail - Remote (PD_FSR)	
Network Interface Detail (PI_NIND)	net-tools-1.60-37
Network Interface Summary (PI_NINS)	
System Summary Overview (PI)	net-snmp-5.1.2-11

Note: If the system adopts SMP by the AMD processor, kernel-smp-2.6.9-5.EL.athlon is required. If the system adopts SMP by the Intel processor, kernel-smp-2.6.9-5.EL.i686 is required.

For Linux AS 4 (IPF)

The following table shows the RPM packages required when collecting a specific record on Linux AS 4 (IPF). Note that you can check the installed RPM package by executing the following command:

```
/bin/rpm -qa
```

Table A.31 RPM Packages Required When Collecting a Specific Record on Linux AS 4 (IPF)

Record Name (Record ID)	RPM Package
Device Detail (PI_DEVD)	MAKEDEV-3.15-2
Device Summary (PI_DEVS)	
File System Detail - Local (PD_FSL)	filesystem-2.3.0-1
File System Detail - Remote (PD_FSR)	
Network Interface Detail (PI_NIND)	net-tools-1.60-37
Network Interface Summary (PI_NINS)	
System Summary Overview (PI)	net-snmp-5.1.2-11

A.6 Estimating Memory Requirements

The memory requirements vary depending on the setup and on the conditions under which the Agent will be used. The memory requirements for each Agent are explained below. For details on the applicable OSs for each Agent, see section A.1.

A.6.1 Agent for RAID

Table A.32 provides general estimates of the amount of memory required for Agent for RAID. In the table, the term initial conditions refers to the condition of running one instance of Agent for RAID.

Table A.32 Agent for RAID Memory Requirements

Status of Agent for RAID	Memory Requirements (Megabytes)				
	Windows	HP-UX	HP-UX (IPF)	Solaris	AIX
Operating under initial conditions	$a + b + c + d$	$a + b + c + d$	$a + b + c + d$	$a + b + c + d$	$a + b + c + d$
Other than initial conditions	$a_1 + a_2 + ... + a_n + (b \times n) + c + d$	$a_1 + a_2 + ... + a_n + (b \times n) + c + d$	$a_1 + a_2 + ... + a_n + (b \times n) + c + d$	$a_1 + a_2 + ... + a_n + (b \times n) + c + d$	$a_1 + a_2 + ... + a_n + (b \times n) + c + d$

Legend:

a: Memory requirement for the `jpcagtd` process (When the number of instances is *n*, the memory requirement for each instance varies from a_1 to a_n.)

b: Memory requirement for the `jpcsto` process

c: Memory requirement for the `jpcah` process

d: Memory requirement for the `jpcstatsvr` process (When the status management function is used.)

n: Number of instances of the Agent

The memory requirement varies depending on the OS. The following table shows the memory requirements for each process:

Table A.33 Agent for RAID Memory Requirements for Each Process

Process Name	Memory Requirements (Megabytes)				
	Windows	HP-UX	HP-UX (IPF)	Solaris	AIX
`jpcagtd`	80	90	90	90	80
`jpcsto`	16	20	20	16	16
`jpcah`	8	8	8	8	6
`jpcstatsvr`	8	8	8	8	6

A.6.2 HTM Agent

A general estimate for the amount of memory required by HTM Agent is provided below for each operating system.

For Windows

The table below provides general estimates for the amount of memory required for HTM Agent on a Windows host.

Table A.34 HTM Agent Memory Requirements (Windows)

Status of HTM Agent	Memory Requirements (megabytes)			
	Windows 2000	Windows Server 2003	Windows Server 2003 (when installing Agent for Microsoft Exchange Server)	Windows Server 2003 (IPF)
Operating under initial conditions	70	70	98	80
Other than initial conditions	(14,000 + (6,000 + 3 x *a* + 3 x *b* + 640 x *c* + 640 x *d*)) / 1,024 + 40 + *e*	(14,000 + (6,000 + 3 x *a* + 3 x *b* + 640 x *c* + 640 x *d*)) / 1,024 + 40 + *e*	(14,000 + (6,000 + 3 x *a* + 3 x *b* + 640 x *c* + 640 x *d*)) / 1,024 + 68 + *e*	(14,000 + (6,000 + 3 x *a* + 3 x *b* + 640 x *c* + 640 x *d*)) / 1,024 + 50 + *e*

Legend:

a: Number of active processes in all HiCommand Tuning Manager series programs

b: Number of processes that stopped in one minute (maximum of 1,000 processes)

c: Number of real-time reports displayed in Performance Reporter

d: Number of records to be collected regularly and for which the performance data collection condition is set to `Log=Y`

e: Memory requirement when the status management function is used

The table below shows the memory requirement for *e*.

Table A.35 Incremental Memory Requirement When the Status Management Function Is Used (Windows)

Status of HTM Agent	Incremental Memory Requirement from the Initial State (megabytes)			
	Windows 2000	Windows Server 2003	Windows Server 2003 (when installing Agent for Microsoft Exchange Server)	Windows Server 2003 (IPF)
When the status management function is used	8	8	8	8

For UNIX

The following formula is used for estimating the amount of memory required for HTM Agent on a UNIX host:

HTM Agent memory requirement = *A* + *B* + *C*

Legend:

A: Memory requirement in the initial state

B: Incremental memory requirement from the initial state when the status management function is used

C: Additional memory requirement necessary for record collection

The table below shows the memory requirement for *A*.

Table A.36 HTM Agent Memory Requirements (UNIX)

Status of HTM Agent	Memory Requirement (megabytes)					
	HP-UX	HP-UX (IPF)	Solaris	AIX	Linux	Linux (IPF)
Operating under initial conditions (see *Note*)	90	170	100	90	100	350

Note: Includes the memory needed for collecting histories for the PI record type records of Agent for RAID Map and Agent for Platform (UNIX).

The table below shows the memory requirement for *B*.

Table A.37 Incremental Memory Requirement When the Status Management Function Is Used (UNIX)

Status of HTM Agent	Incremental Memory Requirement from the Initial State (megabytes)					
	HP-UX	HP-UX (IPF)	Solaris	AIX	Linux	Linux (IPF)
When the status management function is used	8	8	8	6	15	60

The following formula is used for calculating the memory requirement for *C*:

$C = (D_1 + E_{11} \ldots\ldots + E_{1m}) + \ldots\ldots (D_n + E_{n1} \ldots\ldots + E_{nm})$

Legend:

D: Memory requirement common to each type of system resources

E: Memory requirement specific to each record

m: Number of records collected

n: Number of system resource types

Note: The following records are set to be collected as they are in their initial condition. For the memory requirement common to each type of system resources and memory requirement specific to each record, estimate them for each record.

Agent for Platform (UNIX) records:

- Device Detail (`PI_DEVD`)
- File System Detail - Local (`PD_FSL`)
- File System Detail - Remote (`PD_FSR`)

The table below shows the memory requirement for *D*.

Table A.38 Memory Requirement Common to Each Type of System Resources

System Resource Type	Record Name (Record ID)	Memory Requirement (kilobytes)					
		HP-UX	HP-UX (IPF)	Solaris	AIX	Linux	Linux (IPF)
CPU	CPU - Per Processor Detail (`PI_CPUP`)	448	176	136	320	40	192
NFS	NFS Client Detail (`PI_NCD`) NFS Client Overview	4,588	3,040	20	54	Not supported	Not supported

	(PI_NCO) NFS Server Detail (PI_NSD) NFS Server Overview (PI_NSO)						
Quota	Quotas (PD_UFSQ)	96	240	264	320	Not supported	Not supported
System	System Summary Overview (PI)	4,696	3,136	224	320	172	336
Tape	Tape Device Summary (PI_TAPS)	Not supported	Not supported	176	Not supported	Not supported	Not supported
Device	Device Detail (PI_DEVD) Device Summary (PI_DEVS)	95 x *Nd* (see *Note*)	101 x *Nd* (see *Note*)	60 x *Nd* (see *Note*)	80 x *Nd* (see *Note*) + 64	57 x *Nd* (see *Note*) + 22	57 x *Nd* (see *Note*) + 136
Network	Network Interface Detail (PI_NIND) Network Interface Summary (PI_NINS)	112	0	32	30	32	96
File system	File System Detail - Local (PD_FSL) File System Detail - Remote (PD_FSR) User File System Storage (PD_UFSS)	330	256	35	41	19	96
Process	Process Detail (PD) Process Detail Interval (PD_PDI) Process Summary (PD_PDS) Program Summary (PD_PGM) Terminal Summary	588 x *Np* (see *Note*) + 850	482 x *Np* (see *Note*) + 766	440 x *Np* (see *Note*) + 144	594 x *Np* (see *Note*) + 288	224 x *Np* (see *Note*) + 318	385 x *Np* (see *Note*) + 471

	(PD_TERM) User Summary (PD_USER) Workgroup Summary (PI_WGRP)						
Process-to-process communication	IPC Summary (PD_IPCS) Message Queue Detail (PD_MSQD) Semaphore Detail (PD_SEMD) Shared Memory Detail (PD_SHMD)	118	16	32	0	Not supported	Not supported
Log	Logged Messages (PL_MESS)	176	32	120	156	Not supported	Not supported

Note: The table below shows how to calculate *Nd* and *Np*.

Table A.39 *Nd* and *Np* Calculation Methods

Type	Calculation Method	Command					
		HP-UX	HP-UX (IPF)	Solaris	AIX	Linux	Linux (IPF)
Nd	Divide the number of disk devices returned by the command shown to the right by 100.	`ioscan -fnC disk`	`ioscan -fnC disk`	`iostat -x`	`iostat -d interval count`	`iostat ALL`	`iostat ALL`
Np	Divide the number of processes returned by the command shown to the right by 100.	`ps –ef`	`ps -ef`	`ps -ef`	`ps -A`	`ps -ef`	`ps -ef`

E can be calculated by the following formula:

E = F + G + H

Legend:

F: Fixed memory requirement for the record

G: Incremental memory requirement for collecting record history

H: Incremental memory requirement for collecting records on a real-time basis (does not depend on the number of real-time reports displayed)

The table below shows the memory requirement for *E*.

Table A.40 Memory Requirement Specific to Each Record

Record Name (Record ID)	Increment Type	Memory Requirement (kilobytes)					
		HP-UX	HP-UX (IPF)	Solaris	AIX	Linux	Linux (IPF)
CPU - Per Processor Detail (`PI_CPUP`)	Fixed	448	176	136	320	40	192
	History	0	0	0	0	0	0
	Real-time	264	240	400	336	528	944
Device Detail (`PI_DEVD`)	Fixed	72 x *Nd* (see *Note*)	97 x *Nd* (see *Note*) + 6	54 x *Nd* (see *Note*) + 528	20 x *Nd* (see *Note*) + 84	63 x *Nd* (see *Note*) + 52	90 x *Nd* (see *Note*) + 128
	History	0	0	62 x *Nd* (see *Note*) – 440	49 x *Nd* (see *Note*) - 78	0	0
	Real-time	118 x *Nd* (see *Note*) + 432	-1 x *Nd* (see *Note*) + 382	0	0	-41 x *Nd* (see *Note*) + 456	-62 x *Nd* (see *Note*) + 928
Device Summary	Fixed	-2 x *Nd*	16	35 x *Nd*	17 x *Nd*	4 x *Nd* (see	11 x *Nd*

(PI_DEVS)		(see *Note*) + 32		(see *Note*) + 88	(see *Note*) + 44	*Note*) - 16	(see *Note*) + 112
	History	0	0	0	-1 x *Nd* (see *Note*) + 34	0	0
	Real-time	-13 x *Nd* (see *Note*) + 400	13 x *Nd* (see *Note*) + 368	-20 x *Nd* (see *Note*) + 440	0	-6 x *Nd* (see *Note*) + 396	-27 x *Nd* (see *Note*) + 928
File System Detail - Local (PD_FSL)	Fixed	32	54	133	0	16	112
	History	0	0	0	0	0	0
	Real-time	1,096	618	440	165	557	928
File System Detail - Remote (PD_FSR)	Fixed	1,016	558	309	249	698	1,120
	History	0	0	0	0	0	0
	Real-time	246	618	400	65	537	928
IPC Summary (PD_IPCS)	Fixed	32	160	310	155	Not supported	Not supported
	History	0	0	0	0	Not supported	Not supported
	Real-time	432	0	814	477	Not supported	Not supported
Logged Messages (PL_MESS)	Fixed	176	32	120	156	Not supported	Not supported
	History	0	0	0	0	Not supported	Not supported
	Real-time	416	400	400	400	Not supported	Not supported
Message Queue Detail (PD_MSQD)	Fixed	282 x *Nm* (see *Note*) + 64	101 x *Nm* (see *Note*) + 198	2 x *Nm* (see *Note*) + 212	Not supported	Not supported	Not supported
	History	442 x *Nm* (see *Note*) + 832	356 x *Nm* (see *Note*) + 220	286 x *Nm* (see *Note*) + 896	Not supported	Not supported	Not supported
	Real-time	0	0	0	Not supported	Not supported	Not supported

Network Interface Detail (PI_NIND)	Fixed	56	336	184	0	12	160
	History	0	0	0	0	0	0
	Real-time	472	2,832	432	240	560	864
Network Interface Summary (PI_NINS)	Fixed	72	432	144	0	8	112
	History	0	0	0	0	0	0
	Real-time	474	2,844	384	240	524	992
NFS Client Detail (PI_NCD)	Fixed	20	16	148	0	Not supported	Not supported
	History	0	0	0	0	Not supported	Not supported
	Real-time	40	0	408	176	Not supported	Not supported
NFS Client Overview (PI_NCO)	Fixed	20	16	164	0	Not supported	Not supported
	History	0	0	0	0	Not supported	Not supported
	Real-time	40	0	408	176	Not supported	Not supported
NFS Server Detail (PI_NSD)	Fixed	20	16	156	0	Not supported	Not supported
	History	0	0	0	0	Not supported	Not supported
	Real-time	40	0	408	176	Not supported	Not supported
NFS Server Overview (PI_NSO)	Fixed	20	16	148	0	Not supported	Not supported
	History	0	0	0	0	Not supported	Not supported
	Real-time	40	0	376	168	Not supported	Not supported

Process Detail (PD)	Fixed	964 x *Np* (see *Note*) + 328	468 x *Np* (see *Note*) + 472	258 x *Np* (see *Note*) + 622	178 x *Np* (see *Note*) + 339	309 x *Np* (see *Note*) + 81	427 x *Np* (see *Note*) + 1,563
	History	-189 x *Np* (see *Note*) + 2,229	0	0	0	0	0
	Real-time	0	78 x *Np* (see *Note*) - 348	277 x *Np* (see *Note*) - 182	550 x *Np* (see *Note*) – 29	9 x *Np* (see *Note*) + 109	211 x *Np* (see *Note*) - 843
Process Detail Interval (PD_PDI)	Fixed	585 x *Np* (see *Note*) - 402	346 x *Np* (see *Note*) + 428	374 x *Np* (see *Note*) + 330	52 x *Np* (see *Note*) + 274	159 x *Np* (see *Note*) + 207	244 x *Np* (see *Note*) + 1,251
	History	-249 x *Np* (see *Note*) + 2,962	0	0	0	0	0
	Real-time	0	80 x *Np* (see *Note*) - 544	162 x *Np* (see *Note*) - 259	312 x *Np* (see *Note*) + 38	104 x *Np* (see *Note*) - 294	120 x *Np* (see *Note*) - 1,065
Process Summary (PD_PDS)	Fixed	681 x *Np* (see *Note*) - 568	520 x *Np* (see *Note*) - 288	680 x *Np* (see *Note*) - 33	248 x *Np* (see *Note*) + 394	200 x *Np* (see *Note*) + 252	336 x *Np* (see *Note*) + 720
	History	549 x *Np* (see *Note*) + 643	768 x *Np* (see *Note*) - 272	450 x *Np* (see *Note*) + 111	399 x *Np* (see *Note*) – 726	218 x *Np* (see *Note*) + 408	406 x *Np* (see *Note*) + 1,017
	Real-time	0	0	0	0	0	0
Program Summary (PD_PGM)	Fixed	23 x *Np* (see *Note*) + 778	4 x *Np* (see *Note*) + 504	-14 x *Np* (see *Note*) + 534	-41 x *Np* (see *Note*) + 588	-30 x *Np* (see *Note*) + 466	-37 x *Np* (see *Note*) + 853
	History	184 x *Np* (see *Note*) - 55	200 x *Np* (see *Note*) - 16	221 x *Np* (see *Note*) - 214	41 x *Np* (see *Note*) - 239	0	39 x *Np* (see *Note*) + 544
	Real-time	0	0	0	0	31 x *Np* (see *Note*) - 121	0
Quotas (PD_UFSQ)	Fixed	96	240	264	320	Not supported	Not supported
	History	0	0	0	0	Not supported	Not supported
	Real-time	864	432	408	500	Not supported	Not supported

Semaphore Detail (PD_SEMD)	Fixed	78 x *Ns* (see *Note*) + 48	124 x *Ns* (see *Note*) + 42	654 x *Ns* (see *Note*) + 292	Not supported	Not supported	Not supported
	History	183 x *Ns* (see *Note*) + 395	83 x *Ns*(see *Note*) + 395	-14 x *Ns* (see *Note*) + 816	Not supported	Not supported	Not supported
	Real-time	0	0	0	Not supported	Not supported	Not supported
Shared Memory Detail (PD_SHMD)	Fixed	100	152	210	Not supported	Not supported	Not supported
	History	400	600	503	Not supported	Not supported	Not supported
	Real-time	0	0	0	Not supported	Not supported	Not supported
System Summary Overview (PI)	Fixed	4,696	3,136	224	320	172	336
	History	0	0	0	0	0	0
	Real-time	240	136	424	336	564	960
Tape Device Summary (PI_TAPS)	Fixed	Not supported	Not supported	176	Not supported	Not supported	Not supported
	History	Not supported	Not supported	0	Not supported	Not supported	Not supported
	Real-time	Not supported	Not supported	392	Not supported	Not supported	Not supported
Terminal Summary (PD_TERM)	Fixed	-3 x *Np* (see *Note*) + 50	-2 x *Np* (see *Note*) + 36	-14 x *Np* (see *Note*) + 510	-1 x *Np* (see *Note*) + 4	-14 x *Np* (see *Note*) + 162	-30 x *Np* (see *Note*) + 48
	History	289 x *Np* (see *Note*) + 193	252 x *Np* (see *Note*) - 8	234 x *Np* (see *Note*) - 331	22 x *Np* (see *Note*) + 149	13 x *Np* (see *Note*) - 186	30 x *Np* (see *Note*) + 912
	Real-time	0	0	0	0	0	0
User File System Storage (PD_UFSS)	Fixed	928	566	317	249	10	80
	History	0	0	0	0	0	0
	Real-time	1,046	938	392	437	611	924

User Summary (PD_USER)	Fixed	292 x *Np* (see *Note*) + 234	250 x *Np* (see *Note*) + 28	-14 x *Np* (see *Note*) + 518	-1 x *Np* (see *Note*) + 45	1 x *Np* (see *Note*) - 9	-27 x *Np* (see *Note*) + 459
	History	0	0	0	281 x *Np* (see *Note*) + 57	4 x *Np* (see *Note*) + 319	4 x *Np* (see *Note*) + 1,179
	Real-time	46 x *Np* (see *Note*) - 289	2 x *Np* (see *Note*) - 20	236 x *Np* (see *Note*) - 341	0	0	0
Workgroup Summary (PI_WGRP)	Fixed	297 x *Np* (see *Note*) + 225	254 x *Np* (see *Note*) + 20	-14 x *Np* (see *Note*) + 518	2 x *Np* (see *Note*) + 387	-6 x *Np* (see *Note*) + 445	-22 x *Np* (see *Note*) + 1,691
	History	0	0	0	0	0	0
	Real-time	975 x *Np* (see *Note*) - 39	534 x *Np* (see *Note*) - 412	644 x *Np* (see *Note*) + 27	664 x *Np* (see *Note*) - 306	227 x *Np* (see *Note*) - 366	375 x *Np* (see *Note*) - 981

Note: The table below shows how to calculate *Nd*, *Nm*, *Np*, and *Ns*.

Table A.41 Methods for Calculating Nd, Nm, Np, and Ns

Type	Calculation Method	Command					
		HP-UX	HP-UX (IPF)	Solaris	AIX	Linux	Linux (IPF)
Nd	Divide the number of disk devices returned by the command shown to the right by 100.	`ioscan -fnC disk`	`ioscan -fnC disk`	`iostat -x`	`iostat -d interval count`	`iostat ALL`	`iostat ALL`
Nm	Divide the number of message queues returned by the command shown to the right by 100.	`ipcs -q`	`ipcs -q`	`ipcs -q`	Not supported	Not supported	Not supported
Np	Divide the number of processes returned by the command shown to the right by 100.	`ps -ef`	`ps -ef`	`ps -ef`	`ps -A`	`ps -ef`	`ps -ef`
Ns	Divide the number of NSEMS returned by the command shown to the right by 100.	`ipcs -as`	`ipcs -as`	`ipcs -as`	Not supported	Not supported	Not supported

A.6.3 Agent for SAN Switch

Table A.42 provides general estimates of the amount of memory required for Agent for SAN Switch. In the table, the term initial conditions refers to the condition of running one instance of Agent for SAN Switch.

Table A.42 Agent for SAN Switch Memory Requirements

Status of Agent for SAN Switch	Memory Requirements (Megabytes)			
	Windows	HP-UX	Solaris	AIX
Operating under initial conditions	*a* + *b* + *c* + *d*	*a* + *b* + *c* + *d*	*a* + *b* + *c* + *d*	*a* + *b* + *c* + *d*
Other than initial conditions	(*a* + *b*) x *n* + *c* + *d*	(*a* + *b*) x *n* + *c* + *d*	(*a* + *b*) x *n* + *c* + *d*	(*a* + *b*) x *n* + *c* + *d*

Legend:

a: Memory requirement for the `jpcagtw` process

b: Memory requirement for the `jpcsto` process

c: Memory requirement for the `jpcah` process

d: Memory requirement for the `jpcstatsvr` process (When the status management function is used.)

n: Number of instances of the Agent

The following table shows the memory requirements for each process. The memory requirements vary, depending on the operating system.

Table A.43 Agent for SAN Switch Memory Requirements for Each Process

Process Name	Memory Requirements (Megabytes)			
	Windows	HP-UX	Solaris	AIX
`jpcagtw`	17 + X_1	26 + X_2	27 + X_3	25 + X_4
`jpcsto`	9	12	10	7
`jpcah`	8	8	8	6
`jpcstatsvr`	8	8	8	6

Legend:

X_1: 0.016 x *number-of-ports*
X_2: 0.06 x *number-of-ports*
X_3: 0.22 x *number-of-ports*
X_4: 0.21 x *number-of-ports*

Note: For the number-of-ports, include not only the number of ports for the switches but also the number of ports for the hosts and storage subsystems connected to the switch. For example, when a switch of 16 ports connects to 16 hosts, the number of ports is 32.

A.6.4 Agent for NAS

Table A.44 provides general estimates of the amount of memory required for Agent for NAS. In the table, the term initial conditions refers to running one instance of Agent for NAS.

Table A.44 Agent for NAS Memory Requirements

Status of Agent for NAS	Memory Requirements (Megabytes)			
	Windows	HP-UX	Solaris	AIX
Operating under initial conditions	*a* + *b* + *c* + *d*	*a* + *b* + *c* + *d*	*a* + *b* + *c* + *d*	*a* + *b* + *c* + *d*
Other than initial conditions	(*a* + *b*) x *n* + *c* + *d*	(*a* + *b*) x *n* + *c* + *d*	(*a* + *b*) x *n* + *c* + *d*	(*a* + *b*) x *n* + *c* + *d*

Legend:

a: Memory requirement for the `jpcagtn` process

b: Memory requirement for the `jpcsto` process

c: Memory requirement for the `jpcah` process

d: Memory requirement for the `jpcstatsvr` process (When the status management function is used.)

n: Number of instances of the Agent

The memory requirement varies depending on the OS. The following shows the memory requirements for each process.

Table A.45 Agent for NAS Memory Requirements for Each Process

Process name	Memory Requirements (Megabytes)			
	Windows	HP-UX	Solaris	AIX
`jpcagtn`	10 + *z*	25 + *z*	20 + *z*	12 + *z*
`jpcsto`	8	5	8	5
`jpcah`	6	4	5	4
`jpcstatsvr`	8	8	8	4

Legend:

z = (*a* x 15 + *b* x 19 + *c* x 21 + *d* x 4 + *e* x 17 + 56)/1,024

The following are necessary only when the indicated records are collected:

a: When `PD` records are collected, the number of processes to be executed on the NAS system

b: When `PI_DEVD` records are collected, the number of LUs on the NAS system

c: When `PD_FSL` records are collected, the number of local file systems on the NAS system

d: When PD_IAC records are collected, the number of IP addresses kept by the NAS system

e: When PD_FSC records are collected, the number of mounts of file systems on the NAS system

In the calculated value for *z*, discard digits below the decimal point.

A.6.5 Agent for Oracle

Table A.46 provides general estimates of the amount of memory required for Agent for Oracle for each OS. In this table, the term initial conditions refers to the condition of running one instance of Agent for Oracle.

Table A.46 Agent for Oracle Memory Requirements

Status of Agent for Oracle	Memory Requirements (Megabytes)				
	Windows	HP-UX	HP-UX (IPF)	Solaris	AIX
Initial conditions	*a* + *b* + *c* + *d* + *e*	*a* + *b* + *c* + 5*d* + *e*	*a* + *b* + *c* + 5*d* + *e*	*a* + *b* + *c* + 5*d* + *e*	*a* + *b* + *c* + 5*d* + *e*

Legend:

a: Memory requirement for the jpcagto process

b: Memory requirement for the jpcsto process

c: Memory requirement for the jpcah process

d: Memory requirement for the jpcOcollect process

e: Memory requirement for the jpcstatsvr process (When the status management function is used.)

The memory requirement varies depending on the OS. The following table shows the memory requirements for each process.

Table A.47 Agent for Oracle Memory Requirements for Each Process

Process Name	Memory Requirements (Megabytes)				
	Windows	HP-UX	HP-UX (IPF)	Solaris	AIX
jpcagto	12	16	16	11	16
jpcsto	16	24	24	12	18
jpcah	8	8	8	8	4
jpcOcollect	16	35	16	16	16
jpcstatsvr	8	8	8	8	4

A.6.6 Agent for Microsoft SQL Server

Table A.48 provides general estimates of the amount of memory required for Agent for Microsoft SQL Server. In the table, the term initial conditions refers to the condition of running one instance of Agent for Microsoft SQL Server.

Table A.48 Agent for Microsoft SQL Server Memory Requirements

Status of Agent for Microsoft SQL Server	Memory Requirements (Megabytes)
Operation under initial conditions	44
Operation under other conditions	$(12^{Note1} + 16^{Note2}) \times n + 8^{Note3} + 8^{Note4}$

Legend:

n: Number of instances of the Agent

Note1: Memory size for the `jpcagtq.exe` process

Note2: Memory size for the `jpcsto.exe` process

Note3: Memory size for the `jpcah.exe` process

Note4: Memory size for the `jpcstatsvr.exe` process (When the status management function is used.)

A.6.7 Agent for DB2

The following table provides general estimates of the memory requirements of Agent for DB2.

Table A.49 Agent for DB2 Memory Requirements

Status of Agent for DB2	Memory Requirements (Megabytes)	
	AIX	Linux
Operation	(*a* + *b*) x *n* + *c* + *d*	(*a* + *b*) x *n* + *c* + *d*

Legend:

a: Memory requirement for the `jpcagtr` process

b: Memory requirement for the `jpcsto` process

c: Memory requirement for the `jpcah` process

d: Memory requirement for the `jpcstatsvr` process (When the status management function is used.)

n: Number of instances of the Agent

The memory requirement varies depending on the OS. The following shows the memory requirements for each process.

Table A.50 Agent for DB2 Memory Requirements for Each Process

Process Name	Memory Requirements (Megabytes)	
	AIX	Linux
`jpcagtr`	27	27
`jpcsto`	18	24
`jpcah`	4	8
`jpcstatsvr`	4	8

A.7 Estimating Disk Space Requirements

This section provides estimates of the amount of disk space required for each Agent. The required disk space of Agents depends on the conditions, such as the number of constructed instances, the number of records used for collecting performance data, and the file size of the common message log.

The common message log is shared among the Tuning Manager series programs on the same host, so you need to add the file size of this log just once when estimating the disc space requirements. The default maximum file size for this log is 4 MB (two 2 MB files). If you want to change this default, see section 6.6. Also, for details on the applicable OSs for each Agent, see section A.1.

A.7.1 Agent for RAID

This section provides estimates of the amount of disk space required for Agent for RAID.

A.7.1.1 Disk Space Requirements for the Entire System

Table A.51 Agent for RAID Disk Space Requirements for the Entire System

Status of Agent for RAID	Disk Space Requirements (Megabytes)				
	Windows	HP-UX	HP-UX (IPF)	Solaris	AIX
At installation	30	130	370	130	290
Operating under initial conditions	*a* + 46	*a* + 96	*a* + 216	*a* + 96	*a* + 176

Legend:

a: Sum of the disk space for each instance

The disk space requirement for a single instance can be calculated as follows:

b + 120 (megabytes)

b: Disk space for the Store database (megabytes). For details about the disk space for the Store database, see section A.7.1.3.

A.7.1.2 Disk Space Requirements for Each Installation Directory

Table A.52 Agent for RAID Disk Space Requirements for Each Installation Directory

Directory Name	Status of Agent for RAID	Disk Space Requirements (megabytes)

		Windows	HP-UX	HP-UX (IPF)	Solaris	AIX
System drive	During installation	10	–	–	–	–
Installation directory for Tuning Manager series programs	During installation	20	–	–	–	–
	Operating under initial conditions	*a* + 46	–	–	–	–
/opt/jp1pc	During installation	–	130	370	130	290
	Operating under initial conditions	–	*a* + 96	*a* + 216	*a* + 96	*a* + 176

Legend:

a: Sum of the disk spaces for each instance

The disk space requirement for a single instance can be calculated as follows:

b + 120 (megabytes)

b: Disk space requirements for the Store database (megabytes)

For details about the disk space requirements for the Store database, see section A.7.1.3.

A.7.1.3 Disk Space Requirements for the Store Database

All records of one record type are stored in the same file in the Store database.

When performance data is stored in the Store database, several fields are added. Since the added fields are included in the disk space requirements, you do not need to re-estimate the disk space requirements.

- Fields commonly added to each record

  The table below shows the fields that are commonly added to each record.

Table A.53 Fields Commonly Added to Each Record

View Name	Manager Name	Description
Agent Host	DEVICEID	Name of the host where the Agent is running
Agent Instance	PROD_INST	Agent instance name
Agent Type	PRODID	Agent product ID
Date	DATE	Record creation date (GMT)
Date and Time	DATETIME	Combination of Date (DATE) and Time (TIME) fields
Drawer Type	DRAWER_TYPE	For records of the PI record type, the period in which data is summarized (minute, hour, day, week, month,

		year)
GMT Offset	GMT_ADJUST	Difference between Greenwich Mean Time and local time (in seconds)
Time	TIME	Record creation time (GMT)

- Fields added when summarizing PI record type data

  These are fields whose names are either a View name or a Manager name, appended by the following character strings. The fields to be added when summarizing PI record type data are listed in the following table.

Table A.54 Fields Added When Summarizing PI Record Type Data

View Name	Manager Name	Description
View-name (Total)	*Manager-name*_TOTAL	Field total value
View-name (Total)	*Manager-name*_TOTAL_SEC	Field total value (utime type)
View-name (Max)	*Manager-name*_HI	Maximum field value
View-*name* (Min)	*Manager-name*_LO	Minimum field value

- Fields added when exporting data stored in the Store database by using the jpcctrl dump command

  The following fields are output when data stored in the Store database is exported using the jpcctrl dump command. These fields are the ones added when performance data is stored in the Store database. Do not use these fields for operations because they are for internal use by Agent for RAID.

  - *Record-ID*_DATE_F
  - *Record-ID*_DEVICEID_F
  - *Record-ID*_DRAWER_TYPE_F
  - *Record-ID*_DRAWER_COUNT
  - *Record-ID*_DRAWER_COUNT_F
  - *Record-ID*_INST_SEQ
  - *Record-ID*_PRODID_F
  - *Record-ID*_PROD_INST_F
  - *Record-ID*_RECORD_TYPE
  - *Record-ID*_RECORD_TYPE_F
  - *Record-ID*_SEVERITY
  - *Record-ID*_SEVERITY_F
  - *Record-ID*_TIME_F
  - *Record-ID*_UOWID
  - *Record-ID*_UOWID_F
  - *Record-ID*_UOW_INST
  - *Record-ID*_UOW_INST_F

- *Record-ID_Manager-name*_COUNT
- *Record-ID_Manager-name*_SEC
- *Record-ID_Manager-name*_MSEC

Note: When you use the `jpcctrl backup` or `jpcctrl dump` command, nearly twice the disk space that is calculated from the table below will be required for a backup file or export file.

Table A.55 shows the disk space requirements for the Store database, for each record type.

Table A.55 Disk Space Requirements for the Store Database

Record Type	Formula for Estimating Disk Space Requirements (Bytes)
PI record type	$X_1 + \ldots + X_i + 3{,}500 \times i$
PD record type	$Y_1 + \ldots + Y_j + 700 \times j$

Legend:

X: Disk space for each record of the PI record type that collects historical data

Y: Disk space for each record of the PD record type that collects historical data

i: Number of records of the PI record type that collect historical data

j: Number of records of the PD record type that collect historical data

Use the following formulas to calculate *X* and *Y* used in the legend of Table A.55:

$X = \{b \times c + (a + 1{,}900) \times \{(b \times c) / (65{,}250 - a) + 1\}^{\text{Note 1}}\} \times d \times 1.5$
$Y = \{b \times e + (a + 1{,}900) \times \{(b \times c) / (65{,}250 - a) + 1\}^{\text{Note 1}} \times (e/c)^{\text{Note 2}}\} \times 1.5$

The meanings of *a* to *e* in the formulas are as follows:

a: Size of the fixed part of each record that collects historical data. For details about the fixed part of each record, see the chapter that describes Agent for RAID records in the *HiCommand Tuning Manager Hardware Reports Reference*.

b: Size of the variable part of each record that collects historical data. For details about the variable part of each record, see the chapter that describes Agent for RAID records in the *HiCommand Tuning Manager Hardware Reports Reference*.

c: Number of instances of each record that collects historical data (1 for a single instance record)

d: Number of stored records for each record that collects historical data (see *Note 3*).

e: Number of stored records for each record that collects historical data (see *Note 4*).

Note 1: In the $\{(b \times c) / (65{,}250 - a) + 1\}$ calculation, the part below the decimal point is discarded.

Note 2: In the (e/c) calculation, the part below the decimal point is discarded.

Note 3: For records of the PI record type, the collected data is summarized automatically over a certain fixed period (minute, hour, day, week, month, year). Thus, you must take into consideration the number of records to be stored over that applicable period. The following table lists the default values for the retention period and the number of records:

Table A.56 Default Values for Retention Period and Number of Records for PI Record Type

Data Type	Retention Period	Number of Records to Be Stored (when Collection Interval is 1 Minute)
Minute	1 day	1,440
Hour	7 days	168
Day	1 year	366
Week	1 year	52
Month	1 year	12
Year	No limit	(*years-collected*) x 1

Note 4: For details about the number of stored records, see the chapter that describes management of the Store database, and the chapter that describes the properties of the Agent service in the *HiCommand Tuning Manager Agent Administration Guide*. The following table lists the default number of records to be stored, for records of each PD record type.

Table A.57 Default Values for Number of Stored Records for Each PD Record Type

Record Name (Record ID)	Number of Records to Be Stored
Storage Detail (PD)	200
CLPR Configuration (PD_CLPC)	10,000
External LDEV Configuration (PD_ELC)	100,000
Logical Device Configuration (PD_LDC)	600,000
LUSE Configuration (PD_LSEC)	100,000
Port Configuration (PD_PTC)	11,000
RAID Group Configuration (PD_RGC)	100,000

A.7.2 HTM Agent (Windows)

This section explains how to estimate the disk space requirement for HTM Agent running on a Windows host.

A.7.2.1 Disk Space Requirements for the Entire System

Table A.58 HTM Agent Disk Space Requirements for the Entire System (Windows)

Status of HTM Agent	Disk Space Requirements (megabytes)

	Windows 2000	Windows Server 2003	Windows Server 2003 (when installing Agent for Microsoft Exchange Server)	Windows Server 2003 (IPF)
During installation	50	50	70	80
Operating under initial conditions (see *Note*)	112 + *W*	112 + *W*	140 + *W*	122 + *W*

Legend:

W: Disk space requirements for the Store database (megabytes)

To determine the disk space requirements for the Store database, add up the disk space requirements calculated for the individual record types.

For the formula for estimating the disk space requirements for each record type, see section A.7.2.3.

Note: The following records are set to be collected as they are in their initial condition. For the disk space requirements used by the Store database, estimate them for each record.

Agent for RAID Map records:

- File System Configuration (PD_FSC)
- IP Address Configuration (PD_IAC)
- System Configuration Detail (PD)

Agent for Platform (Windows) records:

- System Overview (PI)
- Logical Disk Overview (PI_LOGD)
- Physical Disk Overview (PI_PHYD)

Agent for Microsoft Exchange Server records:

- Database (PI_DB)
- MSExchangeIS (PI)
- MSExchangeIS Mailbox (PI_ISM)
- MSExchangeIS Public (PI_ISP)

A.7.2.2 Disk Space Requirements for Each Installation Directory

Table A.59 HTM Agent Disk Space Requirements for Each Installation Directory (Windows)

Directory Name	Status of HTM Agent	Disk Space Requirements (megabytes)			
		Windows 2000	Windows Server 2003	Windows Server 2003 (when installing	Windows Server 2003 (IPF)

				Agent for Microsoft Exchange Server)	
System drive	During installation	20	20	30	40
Installation directory for Tuning Manager series programs	During installation	30	30	40	40
	Operating under initial conditions	112 + *W*	112 + *W*	140 + *W*	122 + *W*

Legend:

W: Disk space requirements for the Store database (megabytes)

To determine the disk space requirements for the Store database, add up the disk space requirements calculated for the individual record types.

For the formula for estimating the disk space requirements for each record type, see section A.7.2.3.

A.7.2.3 Disk Space Requirements for the Store Database

In the Store database, records of the same type are stored in a single file.

When performance data is stored in the Store database, several fields are added. Because these added fields are included in the disk space requirements, there is no need to estimate the requirements again.

- Fields commonly added to each record

  The table below shows the fields that are commonly added to each record.

Table A.60 Fields Commonly Added to Each Record

View Name	Manager Name	Description
Agent Host	DEVICEID	Name of the host where the Agent is running
Agent Instance	PROD_INST	Name of the host where the Agent is running
Agent Type	PRODID	Agent product ID
Date	DATE	Record creation date (GMT)
Date and Time	DATETIME	Combination of date (DATE) and time (TIME) fields
Drawer Type	DRAWER_TYPE	For records of the PI record type, the period over which data is summarized (minute, hour, day, week, month, year)
GMT Offset	GMT_ADJUST	Difference between Greenwich Mean Time (GMT) and local time (in seconds)
Time	TIME	Record creation time (GMT)

- Fields added when summarizing PI record type data

  These are fields whose names are either a view name or a manager name, appended by the following character strings. The fields to be added when summarizing PI record type data are listed in the following table.

Table A.61 Fields Added When Summarizing PI Record Type Data

View Name	Manager Name	Description
View-name (Total)	*Manager-name* _TOTAL	Field total value
View-name (Total)	*Manager-name* _TOTAL_SEC	Field total value (utime type)
View-name (Max)	*Manager-name* _HI	Maximum field value
View-name (Min)	*Manager-name* _LO	Minimum field value

- Fields added when exporting data stored in the Store database by using the jpcctrl dump command

  The following fields are output when data stored in the Store database is exported using the jpcctrl dump command. These fields are also added when performance data is stored in the Store database. Do not use these fields for operations because they are for internal use by HTM Agent.

  - *Record-ID*_DATE_F
  - *Record-ID*_DEVICEID_F
  - *Record-ID*_DRAWER_TYPE_F
  - *Record-ID*_DRAWER_COUNT
  - *Record-ID*_DRAWER_COUNT_F
  - *Record-ID*_INST_SEQ
  - *Record-ID*_PRODID_F
  - *Record-ID*_PROD_INST_F
  - *Record-ID*_RECORD_TYPE
  - *Record-ID*_RECORD_TYPE_F
  - *Record-ID*_SEVERITY
  - *Record-ID*_SEVERITY_F
  - *Record-ID*_TIME_F
  - *Record-ID*_UOWID
  - *Record-ID*_UOWID_F
  - *Record-ID*_UOW_INST
  - *Record-ID*_UOW_INST_F
  - *Record-ID_Manager-name*_COUNT
  - *Record-ID_Manager-name*_SEC
  - *Record-ID_Manager-name*_MSEC

The table below shows the formulas for estimating the disk space requirements for the Store database.

Table A.62 Disk Space Requirements for the Store Database

Record Type	Formula for Estimating Disk Space Requirements (bytes)
PI record type	(X_1 + ... + X_a + 3,500 x a)
PD record type	(Y_1 + ... + Y_b + 700 x b)
PL record type	(Z_1 + ... + Z_c + 700 x c)

Legend:

X: Disk space for each record of the PI record type that collects historical data

X can be calculated by the following formula:

$X = \{e \times f + (d + 1900) \times \{(e \times f) / (65{,}250 - d) + 1\}^{\text{Note 1}}\} \times g \times 1.5$

Y: Disk space for each record of the PD record type that collects historical data

Y can be calculated by the following formula:

$Y = \{e \times h + (d + 1900) \times \{(e \times f) / (65{,}250 - d) + 1\}^{\text{Note 1}} \times (h/f)^{\text{Note 2}}\} \times 1.5$

Z: Disk space for each record of the PL record type that collects historical data

Z can be calculated by the following formula:

$Z = \{e \times h + (d + 1900) \times \{(e \times f) / (65{,}250 - d) + 1\}^{\text{Note 1}} \times (h/f)^{\text{Note 2}}\} \times 1.5$

a: Number of records of the PI record type that collect historical data

b: Number of records of the PD record type that collect historical data

c: Number of records of the PL record type that collect historical data

d: Size of the fixed part of each record that collects historical data (see *Note 3*)

e: Size of the variable part of each record that collects historical data (see *Note 3*)

f: Number of instances for each record that collects historical data (1 for single instance record) (see *Note 4*)

g: Number of stored records for each record that collects historical data (see *Note 5*)

h: Number of stored records for each record that collects historical data (see *Note 6*)

Note: If you execute the `jpcctrl backup` or `jpcctrl dump` command, the backup file or export file requires approximately twice the disk space as the amount calculated.

Note 1: In the {(*e* x *f*) / (65,250 - *d*) + 1} calculation, discard the decimal part.

Note 2: In the (*h*/*f*) calculation, discard the decimal part.

Note 3: For details about the sizes of the fixed and variable parts of each record of Agent for RAID Map and Agent for Platform (Windows), see the chapter that describes records in the *HiCommand Tuning Manager Operating System Reports Reference*. For details about the sizes of the fixed and variable parts of each record of Agent for Microsoft Exchange Server, see the chapter that describes records in the *HiCommand Tuning Manager Application Reports Reference*.

Note 4: For Agent for RAID Map, the number of instances for each record can be estimated by using the commands shown in the following table:

Table A.63 Commands for Estimating the Number of Instances for Each Record (Agent for RAID Map)

Record Name (Record ID)	Command	Description
File System Configuration (PD_FSC)	None	(The number of devices x the number of multi paths) + (the number of drive letters)
IP Address Configuration (PD_IAC)	ipconfig	The number of IP addresses returned by this command.
System Configuration Detail (PD)	None	1 (because the record has only a single instance)

For Agent for Platform (Windows), the number of instances for the records shown in the table below can be estimated based on the number of instances for the performance object that corresponds to each record. To check the number of instances for the performance object, in the Performance window, use **System Monitor** and **Performance Logs and Alerts**.

Table A.64 Records Whose Number of Instances Can Be Checked in the Performance Window (Agent for Platform (Windows))

Record Name (Record ID)	Performance Object Corresponding to the Record	Description
Logical Disk Overview (PI_LOGD)	LogicalDisk	Number of instances
Physical Disk Overview (PI_PHYD)	PhysicalDisk	Number of instances
AppleTalk Overview (PI_APLE)	Apple Talk	Number of instances
Network Link IPX Overview (PI_LIPX)	NWLink IPX	Number of instances
Network Link SPX Overview (PI_LSPX)	NWLink SPX	Number of instances
Network Link NetBIOS Overview (PI_LBIO)	NWLink NetBIOS	Number of instances
ICMP Overview (PI_ICMP)	ICMP	1 (because the record has only a single instance)
IP Overview (PI_IP)	IP or IPv4	1 (because the record has only a single instance)
TCP Overview (PI_TCP)	TCP or TCPv4	1 (because the record has only a single instance)
UDP Overview (PI_UDP)	UDP or UDPv4	1 (because the record has only a single instance)
Network Interface Overview (PI_NETI)	Network Interface	Number of instances
NBT Overview (PI_NBT)	NBT Connection	Number of instances
Network Segment Overview (PI_NSEG)	Network Segment	Number of instances

WINS Server Overview (PI_WINS)	WINS Server	1 (because the record has only a single instance)
Browser Overview (PI_BRSR)	Browser	1 (because the record has only a single instance)
Server Work Queues Overview (PI_SVRQ)	Server Work Queues	Number of instances
System Overview (PI)	"_total" instances for Redirector, Server, Cache, Memory, Objects, System, and Processor	1 (because the record has only a single instance)
Processor Overview (PI_PCSR)	Processor	Number of instances
Page File Detail (PD_PAGF)	Paging File	Number of instances
Internet Info Server Global (PI_IIS)	Internet Information Services Global	1 (because the record has only a single instance)
Active Server Pages (PI_ASP2)	Active Server Pages	1 (because the record has only a single instance)
FTP Server Service Overview (PI_FTPM)	FTP Service	Number of instances
NNTP Commands (PI_NWSC)	NNTP Commands	Number of instances
NNTP Server (PI_NWSS)	NNTP Server	Number of instances
SMTP Server Service Overview (PI_SMT2)	SMTP Server	Number of instances
Web Service Overview (PI_WEB)	Web Service	Number of instances
WinSock Proxy Server Overview (PI_WSPS)	WinSock Proxy Server	1 (because the record has only a single instance)
Web Proxy Server Cache Overview (PI_WPSC)	Web Proxy Server Cache	1 (because the record has only a single instance)
Web Proxy Server Service (PI_WPSS)	Web Proxy Server Service	1 (because the record has only a single instance)
Exchange Conn for Lotus cc:Mail (PI_ECCM)	MSExchangeCCMC	1 (because the record has only a single instance)
Exchange Dir Service Overview (PI_EDS)	MSExchangeDS	1 (because the record has only a single instance)
Exchange Internet Protocols (PI_EINP)	MSExchange Internet Protocols	Number of instances
Exchange Info Store Perf Data (PI_EIPD)	MSExchangeIS	1 (because the record has only a single instance)
Exchange Info Store Private (PI_EIPR)	MSExchangeIS Private	1 (because the record has only a single instance)
Exchange Info Store Public (PI_EIPU)	MSExchangeIS Public	1 (because the record has only a single instance)
Exchange Internet Mail Service (PI_EIMS)	MSExchangeIMC	1 (because the record has only a single instance)
Exchange MTA Performance (PI_EMTA)	MSExchangeMTA	1 (because the record has only a single instance)

Exchange MTA Connections (PI_EMTC)	MSExchangeMTA Connections	Number of instances
Exchange MSMail Conn PC MTA Srv (PI_EMTS)	MSExchangePCMTA	1 (because the record has only a single instance)
Exchange MSMail Conn Interchange (PI_EMCI)	MSExchangeMSMI	1 (because the record has only a single instance)
Exchange Web Component Overview (PI_EWEB)	MSExchangeWEB	1 (because the record has only a single instance)
Process Detail (PD)	Process	Number of instances
Process Detail Interval (PD_PDI)	Process	Number of instances
Process End Detail (PD_PEND)	Process	Number of instances that terminate during the collection interval

The table below shows the records for which the number of instances can be estimated in a window other than the Performance window.

Table A.65 Records Whose Number of Instances Can Be Checked in a Window Other than the Performance Window (Agent for Platform (Windows))

Record Name (Record ID)	Window to Use	Description
Event Log (PD_ELOG)	Administration Tool - Event Viewer	Number of logs output during the collection interval
Device Detail (PD_DEV)	System Tool - System Information -Software Environment - Driver	Number of registered drivers
Service Process Detail (PD_SVC)	Administration Tool - Service	Number of registered services

The table below shows the number of instances of each record for Agent for Microsoft Exchange Server.

Table A.66 Number of Instances of Each Record (Agent for Microsoft Exchange Server)

Record Name (Record ID)	Number of Instances
Database (PI_DB)	1 (single instance record)
Epoxy (PI_EPOX)	7
MSExchangeIS (PI)	1 (single instance record)
MSExchangeIS Mailbox (PI_ISM)	1 (single instance record)
MSExchangeIS Public (PI_ISP)	1 (single instance record)
Process (PD)	4

Note 5: For records of the PI record type, the collected data is summarized automatically over a certain fixed period (minute, hour, day, week, month, and year). Thus, you must take into consideration the number of records to be stored over the applicable period. The following table lists the default values for the retention period and number of records.

Table A.67 Default Values for Retention Period and Number of Records for PI Record Type

Data Type	Retention Period	Number of Records to Be Stored (when Collection Interval is 1 Minute)
Minute-by-minute	1 day	1,440
Hourly	7 days	168
Daily	1 year	366
Weekly	1 year	52
Monthly	1 year	12
Yearly	Unlimited	(*years-collected*) x 1

Note 6: For details about the number of records retained, see the chapter that describes the properties of the Agent Store service in the *HiCommand Tuning Manager Agent Administration Guide*.

The following table lists the default number of records to be stored, for records of each PD record type.

Table A.68 Default Values for Number of Stored Records for Each PD Record Type

Agent	Record Name (Record ID)	Number of Records to be Stored
Agent for RAID Map	Process Detail (PD)	200
	File System Configuration (PD_FSC)	10,000
	IP Address Configuration (PD_IAC)	1,000
Agent for Platform (Windows)	Process Detail Interval (PD_PDI)	100,000
	Other than Process Detail Interval (PD_PDI)	10,000
Agent for Microsoft Exchange Server	Process (PD)	10,000

A.7.3 HTM Agent (UNIX)

This section explains how to estimate the disk space requirement for HTM Agent running on a UNIX host.

A.7.3.1 Disk Space Requirements for the Entire System

Table A.69 HTM Agent Disk Space Requirements for the Entire System (UNIX)

Status of HTM Agent	Disk Space Requirements (megabytes)					
	HP-UX	HP-UX (IPF)	Solaris	AIX	Linux	Linux (IPF)
During installation	230	650	300	400	150	150

Operating under initial conditions (See *Note*)	152 + *W*	262 + *W*	172 + *W*	202 + *W*	152 + *W*	152 + *W*

Legend:

W: Disk space requirements for the Store database (megabytes)

To determine the disk space requirements for the Store database, add up the disk space requirements calculated for the individual record types.

For the formula for estimating the disk space requirements for each record type, see section A.7.3.3.

Note: The following records are set to be collected as they are in their initial condition. For the disk space requirements used by the Store database, estimate them for each record.

Agent for RAID Map records:

- File System Configuration (PD_FSC)
- IP Address Configuration (PD_IAC)
- System Configuration Detail (PD)

Agent for Platform (UNIX) records:

- System Summary Overview (PI)
- Device Detail (PI_DEVD)
- File System Detail - Local (PD_FSL)
- File System Detail - Remote (PD_FSR)

A.7.3.2 Disk Space Requirements for Each Installation Directory

Table A.70 Disk Space Requirements for Each Installation Directory

Directory Name	Status of HTM Agent	Disk Space Requirements (megabytes)					
		HP-UX	HP-UX (IPF)	Solaris	AIX	Linux	Linux (IPF)
/opt/jp1pc	During installation	230	650	300	400	150	150
	Operating under initial conditions	152 + *W*	262 + *W*	172 + *W*	202 + *W*	152 + *W*	152 + *W*

Legend:

W: Disk space requirements for the Store database (megabytes)

To determine the disk space requirements for the Store database, add up the disk space requirements calculated for the individual record types.

For the formula for estimating the disk space requirements for each record type, see section A.7.3.3.

A.7.3.3 Disk Space Requirements for the Store Database

In the Store database, records of the same type are stored in a single file.

When performance data is stored in the Store database, several fields are added. Because these added fields are included in the disk space requirements, there is no need to estimate the requirements again.

- Fields commonly added to each record

  The table below shows the fields that are commonly added to each record.

Table A.71 Fields Commonly Added to Each Record

View Name	Manager Name	Description
Agent Host	DEVICEID	Name of the host where the Agent is running
Agent Instance	PROD_INST	Name of the host where the Agent is running
Agent Type	PRODID	Agent product ID
Date	DATE	Record creation date (GMT)
Date and Time	DATETIME	Combination of date (DATE) and time (TIME) fields
Drawer Type	DRAWER_TYPE	For records of the PI record type, the period in which data is summarized (minute, hour, day, week, month, year)
GMT Offset	GMT_ADJUST	Difference between Greenwich Mean Time (GMT) and local time (in seconds)
Time	TIME	Record creation time (GMT)

- Fields added when summarizing PI record type data

  These are fields whose names are either a view name or a manager name, appended by the following character strings. The fields to be added when summarizing PI record type data are listed in the following table.

Table A.72 Fields Added When Summarizing PI Record Type Data

View Name	Manager Name	Description
view-name (Total)	*manager-name*_TOTAL	Field total value
view-name (Total)	*manager-name*_TOTAL_SEC	Field total value (utime type)
view-name (Max)	*manager-name*_HI	Maximum field value
view-name (Min)	*manager-name*_LO	Minimum field value

- Fields added when exporting data stored in the Store database by using the `jpcctrl dump` command

The following fields are output when data stored in the Store database is exported using the `jpcctrl dump` command. These fields are also added when performance data is stored in the Store database. Do not use these fields for operations because they are for internal use by HTM Agent.

- *Record-ID*_DATE_F
- *Record-ID*_DEVICEID_F
- *Record-ID*_DRAWER_TYPE_F
- *Record-ID*_DRAWER_COUNT
- *Record-ID*_DRAWER_COUNT_F
- *Record-ID*_INST_SEQ
- *Record-ID*_PRODID_F
- *Record-ID*_PROD_INST_F
- *Record-ID*_RECORD_TYPE
- *Record-ID*_RECORD_TYPE_F
- *Record-ID*_SEVERITY
- *Record-ID*_SEVERITY_F
- *Record-ID*_TIME_F
- *Record-ID*_UOWID
- *Record-ID*_UOWID_F
- *Record-ID*_UOW_INST
- *Record-ID*_UOW_INST_F
- *Record-ID_Manager-name*_COUNT
- *Record-ID_Manager-name*_SEC
- *Record-ID_Manager-name*_MSEC

The table below shows the formulas for estimating the disk space requirements for the Store database.

Table A.73 Disk Space Requirements for the Store Database

Record Type	Formula for Estimating Disk Space Requirements (bytes)
PI record type	(X_1 + ... + X_a + 3,500 x a)
PD record type	(Y_1 + ... + Y_b + 700 x b)
PL record type	(Z_1 + ... + Z_c + 700 x c)

Legend:

X: Disk space for each record of the PI record type that collects historical data

X can be calculated by the following formula:

$$X = \{e \times f + (d + 1900) \times \{(e \times f) \ / \ (65{,}250 - d) + 1\}^{\text{Note 1}}\} \times g \times 1.5$$

Y: Disk space for each record of the PD record type that collects historical data

Y can be calculated by the following formula:

$Y = \{e \times h + (d + 1900) \times \{(e \times f) / (65{,}250 - d) + 1\}^{\text{Note 1}} \times (h/f)^{\text{Note 2}}\} \times 1.5$

Z: Disk space for each record of the PL record type that collects historical data

Z can be calculated by the following formula:

$Z = \{e \times h + (d + 1900) \times \{(e \times f) / (65{,}250 - d) + 1\}^{\text{Note 1}} \times (h/f)^{\text{Note 2}}\} \times 1.5$

a: Number of records of the PI record type that collect historical data

b: Number of records of the PD record type that collect historical data

c: Number of records of the PL record type that collect historical data

d: Size of the fixed part of each record that collects historical data (see *Note 3*)

e: Size of the variable part of each record that collects historical data (see *Note 3*)

f: Number of instances of each record that collects historical data (1 for single instance record) (see *Note 4*)

g: Number of stored records for each record that collects historical data(see *Note 5*)

h: Number of stored records for each record that collects historical data(see *Note 6*)

Note: If you execute the `jpcctrl backup` or `jpcctrl dump` command, the backup file or export file requires approximately twice the disk space as the amount calculated.

Note 1: In the {(*e* x *f*) / (65,250 - *d*) + 1} calculation, discard the decimal part.

Note 2: In the (*h*/*f*) calculation, discard the decimal part.

Note 3: For details about the sizes of the fixed and variable parts of each record, see the *HiCommand Tuning Manager Operating System Reports Reference*.

Note 4: For Agent for RAID Map, the number of instances for each record can be estimated by using the commands shown in the following table.

Table A.74 Commands for Estimating the Number of Instances for Each Record (Agent for RAID Map)

	Command				
Record Name (Record ID)	HP-UX	Solaris	AIX	Linux	Description
File System Configuration (`PD_FSC`)	None	None	None	None	(The number of devices x the number of multi paths) + (the number of mount points) + (the number of volume groups x the number of devices that belong to the volume group)
IP Address Configuration (`PD_IAC`)	`lanscan –i` `ifconfig interface`	`ifconfig -a`	`ifconfig -a`	`ifconfig -a`	The number of IP addresses returned by this command.
System Configuration	None	None	None	None	1 (because the record has only a single

Detail (PD)					instance)

For Agent for Platform (UNIX), the number of instances for each record can be estimated by using the commands shown in the following table.

Table A.75 Commands for Estimating Number of Instances for Each Record (Agent for Platform (UNIX))

	Command				
Record Name (Record ID)	HP-UX	Solaris	AIX	Linux	Description
CPU - Per Processor Detail (PI_CPUP)	`sar -u -M interval count`	`sar -u interval count`	`sar -w -P ALL interval count`	`top –c`	Number of CPUs returned by this command
Device Detail (PI_DEVD)	`ioscan -fnC disk`	`iostat -x`	`iostat -d interval count`	`iostat ALL`	For HP-UX, Solaris, and AIX: Number of disk devices returned by this command For Linux: Number of disk devices, excluding partitions, returned by this command
Device Summary (PI_DEVS)	None	None	None	None	1 (because the record has only a single instance)
File System Detail - Local (PD_FSL)	`df`	`df`	`df`	`df`	Number of file systems without host names returned by this command
File System Detail - Remote (PD_FSR)	`df`	`df`	`df`	`df`	Number of file systems with host names returned by this command
IPC Summary (PD_IPCS)	None	None	None	None	1 (because the record has only a single instance) This record cannot be used in AIX or Linux because it is not supported.
Logged Messages (PL_MESS)	None	None	None	None	Number of lines written into the file specified by the Messages File property or the event file This record cannot be used in Linux because it is not supported.
Message Queue Detail (PD_MSQD)	`ipcs -q`	`ipcs -q`	None	None	Number of message queues returned by this command This record cannot be used in AIX or Linux because it is not supported.

Network Interface Detail (PI_NIND)	lanscan	netstat -in	ifconfig -a	netstat -ni	For HP-UX: Number of physical interfaces returned by this command + 1 For Solaris, AIX, and Linux: Number of physical interfaces returned by this command
Network Interface Summary (PI_NINS)	None	None	None	None	1 (because the record has only a single instance)
NFS Client Detail (PI_NCD)	None	None	None	None	1 (because the record has only a single instance) This record cannot be used in Linux because it is not supported.
NFS Client Overview (PI_NCO)	None	None	None	None	1 (because the record has only a single instance) This record cannot be used in Linux because it is not supported.
NFS Server Detail (PI_NSD)	None	None	None	None	1 (because the record has only a single instance) This record cannot be used in Linux because it is not supported.
NFS Server Overview (PI_NSO)	None	None	None	None	1 (because the record has only a single instance) This record cannot be used in Linux because it is not supported.
Process Detail (PD)	ps -ef	ps -ef	ps -A	ps –ef	Number of processes returned by this command
Process Detail Interval (PD_PDI)	ps -ef	ps -ef	ps -A	ps –ef	Number of processes returned by this command
Process Summary (PD_PDS)	None	None	None	None	1 (because the record has only a single instance)
Program Summary (PD_PGM)	ps -e	ps -e	ps -A	ps –e	Number of unique CMDs displayed by this command
Quotas (PD_UFSQ)	repquota -v filesystem	repquota -v filesystem	repquota -a	None	Total number of users of all file systems displayed by this command This record cannot be used in Linux because it

					is not supported.
Semaphore Detail (PD_SEMD)	ipcs -as	ipcs -as	None	None	Total number of NSEMS returned by this command This record cannot be used in Linux or AIX because it is not supported
Shared Memory Detail (PD_SHMD)	ipcs -m	ipcs -m	None	None	Number of shared memory segments returned by this command This record cannot be used in Linux or AIX because it is not supported.
System Summary Overview (PI)	None	None	None	None	1 (because the record has only a single instance)
Tape Device Summary (PI_TAPS)	None	iostat -x	None	None	Number of tape devices returned by this command This record cannot be used in HP-UX, AIX, or Linux because it is not supported.
Terminal Summary (PD_TERM)	ps -e	ps -e	ps -Af	ps –e	Number of unique TTYs displayed by this command
User Data Detail (PD_UPD)	None	None	None	None	This record cannot be used because it is not supported.
User Data Detail - Extended (PD_UPDB)	None	None	None	None	This record cannot be used because it is not supported.
User Data Interval (PI_UPI)	None	None	None	None	This record cannot be used because it is not supported.
User Data Interval - Extended (PI_UPIB)	None	None	None	None	This record cannot be used because it is not supported.
User File System Storage (PD_UFSS)	diskusg filesystem	quot -a	diskusg filesystem	None	For HP-UX, Solaris, and AIX: Total number of users of all file systems displayed by this command For Linux: Total number of users of all file systems (however, there is no command that can be used)
User Summary (PD_USER)	ps -ef	ps -ef	ps -ef	ps –ef	Number of unique RUIDs displayed by this

					command
Workgroup Summary (PI_WGRP)	None	None	None	None	Number of work groups specified in the work group file + 1

Note 5: For records of the PI record type, the collected data is summarized automatically over a certain fixed period (minute, hour, day, week, month, or year). Thus, you must take into consideration the number of records to be stored over the applicable period. The following table lists the default values for the retention period and the number of records.

Table A.76 Default Values for Retention Period and Number of Records for PI Record Type

Data Type	Retention Period	Number of Records (when Collection Interval is 1 Minute)
Minute-by-minute	1 day	1,440
Hourly	7 days	168
Daily	1 year	366
Weekly	1 year	52
Monthly	1 year	12
Yearly	Unlimited	(*years-collected*) x 1

Note 6: For details about the number of records retained, see the chapter that describes the properties of the Agent Store service in the *HiCommand Tuning Manager Agent Administration Guide*.

The following table lists the default number of records to be stored, for records of each PD record type.

Table A.77 Default Values for Number of Stored Records for Each PD Record Type

Agent	Record Name (Record ID)	Number of Records to be Stored
Agent for RAID Map	System Configuration Detail (PD)	200
	File System Configuration (PD_FSC)	10,000
	IP Address Configuration (PD_IAC)	1,000
Agent for Platform (UNIX)	Process Detail Interval (PD_PDI)	100,000
	Other than Process Detail Interval (PD_PDI)	10,000

A.7.4 Agent for SAN Switch

Agent for SAN Switch collects all the records under the initial conditions. The disk space requirement varies depending on the number of switches or devices that are to be monitored. The following sections provide estimates of the disk space required for Agent for SAN Switch.

A.7.4.1 Disk Space Requirements for the Entire System

The following table describes the estimates of the disk space requirements for the entire system.

Table A.78 Agent for SAN Switch Disk Space Requirements for the Entire System

Status of Agent for SAN Switch	Disk Space Requirements (Megabytes)			
	Windows	HP-UX	Solaris	AIX
During installation	35	180	160	300
Operating under initial conditions	*21 + a*	*61 + a*	*66 + a*	*146 + a*

Legend:

a: Sum of the disk spaces for each instance

The disk space requirement for a single instance can be calculated as follows:

b + 35 (megabytes)

b: Disk space for the Store database (megabytes).

For details about the disk space for the Store database, see section A.7.4.3.

A.7.4.2 Disk Space Requirements for Each Installation Directory

Table A.79 Agent for SAN Switch Disk Space Requirements for Each Installation Directory

Directory Name	Status of Agent for SAN Switch	Disk Space Requirements (megabytes)			
		Windows	HP-UX	Solaris	AIX
System drive	During installation	10	---	---	---
Installation directory for Tuning Manager series programs	During installation	25	---	---	---
	Operating under initial conditions	21 + *a*	---	---	---
/opt/jp1pc	During installation	---	180	160	300
	Operating under initial conditions	---	61 + *a*	66 + *a*	146 + *a*

Legend:

---: Not applicable

a: Sum of the disk spaces for each instance

The disk space requirement for a single instance can be calculated as follows:

b + 35 (megabytes)

b: Disk space requirements for the Store database (megabytes)

For details about the disk space requirements for the Store database, see section A.7.4.3.

A.7.4.3 Disk Space Requirements for the Store Database

All records of one record type are stored in the same file in the Store database.

When performance data is stored in the Store database, several fields are added. Since the added fields are included in the disk space requirements, you do not need to re-estimate the disk space requirements.

- Fields commonly added to each record

  The table below shows the fields that are commonly added to each record.

Table A.80 Fields Commonly Added to Each Record

View Name	Manager Name	Description
Agent Host	DEVICEID	Name of the host where the Agent is running

Agent Instance	PROD_INST	Agent instance name
Agent Type	PRODID	Agent product ID
Date	DATE	Record creation date (GMT)
Date and Time	DATETIME	Combination of Date (DATE) and Time (TIME) fields
Drawer Type	DRAWER_TYPE	For records of the PI record type, the period in which data is summarized (minute, hour, day, week, month, year)
GMT Offset	GMT_ADJUST	Difference between Greenwich Mean Time and local time (in seconds).
Time	TIME	Record creation time (GMT)

- Fields added when summarizing PI record type data

  These are fields whose names are either a View name or a Manager name, appended by the following character strings. The fields to be added when summarizing PI record type data are listed in the following table.

Table A.81 Fields Added When Summarizing PI Record Type Data

View Name	Manager Name	Description
View-name (Total)	*Manager-name*_TOTAL	Field total value
View-name (Total)	*Manager-name*_TOTAL_SEC	Field total value (utime type)
View-name (Max)	*Manager-name*_HI	Maximum field value
View-name (Min)	*Manager-name*_LO	Minimum field value

- Fields added when exporting data stored in the Store database by using the jpcctrl dump command:

  The following fields are output when data stored in the Store database is exported by using the jpcctrl dump command. These fields are the ones added when performance data is stored in the Store database. Do not use these fields for operations because they are for internal use by Agent for SAN Switch.

  - *Record-ID*_DATE_F
  - *Record-ID*_DEVICEID_F
  - *Record-ID*_DRAWER_TYPE_F
  - *Record-ID*_DRAWER_COUNT
  - *Record-ID*_DRAWER_COUNT_F
  - *Record-ID*_INST_SEQ
  - *Record-ID*_PRODID_F
  - *Record-ID*_PROD_INST_F
  - *Record-ID*_RECORD_TYPE
  - *Record-ID*_RECORD_TYPE_F
  - *Record-ID*_SEVERITY

- *Record-ID*_SEVERITY_F
- *Record-ID*_TIME_F
- *Record-ID*_UOWID
- *Record-ID*_UOWID_F
- *Record-ID*_UOW_INST
- *Record-ID*_UOW_INST_F
- *Record-ID_Manager-name*_COUNT
- *Record-ID_Manager-name*_SEC
- *Record-ID_Manager-name*_MSEC

Note: When you use the `jpcctrl backup` or `jpcctrl dump` command, nearly twice the disk space that is calculated from the table below will be required for a backup file or export file.

Table A.82 shows the disk space requirements for the Store database, for each record type.

Table A.82 Disk Space Requirements for the Store Database

Record Type	Formula for Estimating Disk Space Requirements (Bytes)
PI record type	$X_1 + ... + Xi + 3{,}500 \times i$
PD record type	$Y_1 + ... + Yj + 700 \times j$

Legend:

X: Disk space for each record of the PI record type that collects historical data

Y: Disk space for each record of the PD record type that collects historical data

i: Number of records of the PI record type that collect historical data

j: Number of records of the PD record type that collect historical data

Use the following formulas to calculate *X* and *Y* used in the legend of Table A.82:

$X = \{b \times c + (a + 1{,}900) \times \{(b \times c) / (65{,}250 - a) + 1\}^{\text{Note 1}}\} \times d \times 1.5$

$Y = \{b \times e + (a + 1{,}900) \times \{(b \times c) / (65{,}250 - a) + 1\}^{\text{Note 1}} \times (e / c)^{\text{Note 2}}\} \times 1.5$

The meanings of *a* to *e* in the formulas are as follows:

a: Size of the fixed part of each record that collects historical data. For details about the size of the fixed part of each record, see the chapter that describes Agent for SAN Switch records in the *HiCommand Tuning Manager Hardware Reports Reference*.

b: Size of the variable part of each record that collects historical data. For details about the size of the variable part of each record, see the chapter that describes Agent for SAN Switch records in the *HiCommand Tuning Manager Hardware Reports Reference*.

c: Number of instances of each record that collects historical data (1 for a single instance record)

d: Number of stored records for each record that collects historical data (see *Note 3*)

e: Number of stored records for each record that collects historical data (see *Note 4*)

Note 1: In the {(*b* x *c*)/(65,250 - *a*) + 1} calculation, the part below the decimal point is discarded.

Note 2: In the (*e*/*c*) calculation, the decimal part is discarded.

Note 3: For records of the PI record type, the collected data is summarized automatically over a certain fixed period (minute, hour, day, week, month, year). Thus, you must take into consideration the number of records to be stored over that applicable period. The following table lists the default values for the retention period and the number of records.

Table A.83 Default Values for Retention Period and Number of Records for PI Record Type

Data Type	Retention Period	Number of Records to Be Stored (when Collection Interval is 1 Minute)
Minute	1 day	1,440
Hour	7 days	168
Day	1 year	366
Week	1 year	52
Month	1 year	12
Year	Unlimited	(*years-collected*) x 1

Note 4: For details about the number of stored records, see the chapter that describes management of the Store database, and the chapter that describes the properties of the Agent service in the *HiCommand Tuning Manager Agent Administration Guide*. The following table lists the default number of records to be stored, for records of each PD record type.

Table A.84 Default Values for Number of Stored Records for Each PD Record Type

Record Name (Record ID)	Number of Records to be Stored
Switch Detail (PD)	8,400
Connected Port Detail (PD_CPTD)	807,000
Device Detail (PD_DEVD)	132,000
Port Detail (PD_PTD)	396,000

A.7.5 Agent for NAS

This section provides estimates of the amount of disk space required for Agent for NAS.

A.7.5.1 Disk Space Requirements for the Entire System

Table A.85 Agent for NAS Disk Space Requirements for the Entire System

	Disk Space Requirements (Megabytes)			
Status of Agent for NAS	Windows	HP-UX	Solaris	AIX
At installation	22	80	88	152
Operating under initial conditions	46 + *a*	64 + *a*	68 + *a*	100 + *a*

Legend:

a: Sum of the disk spaces for each instance

The disk space requirement for a single instance can be calculated as follows:

b + 78 (megabytes)

b: Disk space for the Store database (megabytes).

For details about the disk space for the Store database, see section A.7.5.3.

A.7.5.2 Disk Space Requirements for Each Installation Directory

Table A.86 Agent for NAS Disk Space Requirements for Each Installation Directory

Directory Name	Status of Agent for NAS	Disk Space Requirements (megabytes)			
		Windows	HP-UX	Solaris	AIX
System drive	During installation	10	---	---	---
Installation directory for Tuning Manager series programs	During installation	12	---	---	---
	Operating under initial conditions	46 + *a*	---	---	---
/opt	During installation	---	40	44	76
/opt/jp1pc	During installation	---	40	44	76
	Operating under initial conditions	---	64 + *a*	68 + *a*	100 + *a*

Legend:

---: Not applicable

a: Sum of the disk spaces for each instance

The disk space requirement for a single instance can be calculated as follows:

b + 78 (megabytes)

b: Disk space requirements for the Store database (megabytes)

For details about the disk space requirements for the Store database, see section A.7.5.3.

A.7.5.3 Disk Space Requirements for the Store Database

All records of one record type are stored in the same file in the Store database.

When performance data is stored in the Store database, several fields are added. Since the added fields are included in the disk space requirements, you do not need to re-estimate the disk space requirements.

- Fields commonly added to each record

  The table below shows the fields that are commonly added to each record.

Table A.87 Fields Commonly Added to Each Record

View Name	Manager Name	Description
Agent Host	DEVICEID	Name of the host where the Agent is running
Agent Instance	PROD_INST	Agent instance name
Agent Type	PRODID	Agent product ID
Date	DATE	Record creation date (GMT).
Date and Time	DATETIME	Combination of Date (DATE) and Time (TIME) fields.
Drawer Type	DRAWER_TYPE	For records of the PI record type, the period in which data is summarized (minute, hour, day, week, month, year)
GMT Offset	GMT_ADJUST	Difference between Greenwich Mean Time and local time (in seconds).
Time	TIME	Record creation time (GMT).

- Fields added when summarizing PI record type data

These are fields whose names are either a View name or a Manager name, appended by the following character strings. The fields to be added when summarizing PI record type data are listed in the following table.

Table A.88 Fields Added When Summarizing PI Record Type Data

View Name	Manager Name	Description
View-name (Total)	*Manager-name*_TOTAL	Field total value
View-name (Total)	*Manager-name*_TOTAL_SEC	Field total value (utime type)
View-name (Max)	*Manager-name*_HI	Maximum field value

View-name (Min)	*Manager-name*_LO	Minimum field value

- Fields added when exporting data stored in the Store database by using the `jpcctrl dump` command

  The following fields are output when data stored in the Store database is exported using the `jpcctrl dump` command. These fields are the ones added when performance data is stored in the Store database. Do not use these fields for operations because they are for internal use by Agent for NAS.

  - *Record-ID*_DATE_F
  - *Record-ID*_DEVICEID_F
  - *Record-ID*_DRAWER_TYPE_F
  - *Record-ID*_DRAWER_COUNT
  - *Record-ID*_DRAWER_COUNT_F
  - *Record-ID*_INST_SEQ
  - *Record-ID*_PRODID_F
  - *Record-ID*_PROD_INST_F
  - *Record-ID*_RECORD_TYPE
  - *Record-ID*_RECORD_TYPE_F
  - *Record-ID*_SEVERITY
  - *Record-ID*_SEVERITY_F
  - *Record-ID*_TIME_F
  - *Record-ID*_UOWID
  - *Record-ID*_UOWID_F
  - *Record-ID*_UOW_INST
  - *Record-ID*_UOW_INST_F
  - *Record-ID_Manager-name*_COUNT
  - *Record-ID_Manager-name*_SEC
  - *Record-ID_Manager-name*_MSEC

Note: When you use the `jpcctrl backup` or `jpcctrl dump` command, nearly twice the disk space that is calculated from the table below will be required for a backup file or export file.

Table A.89 shows the disk space requirements for the Store database, for each record type.

Table A.89 Disk Space Requirements for the Store Database

Record Type	Formula for Estimating Disk Space Requirements (Bytes)
PI record type	$X_1 + ... + X_i + 3{,}500 \times i$
PD record type	$Y_1 + ... + Y_j + 700 \times j$

Legend:

X: Disk space for each record of the PI record type that collects historical data

Y: Disk space for each record of the PD record type that collects historical data

i: Number of records of the PI record type that collect historical data

j: Number of records of the PD record type that collect historical data

Use the following formulas to calculate *X* and *Y* used in the legend of Table A.89:

$X = \{b \times c + (a + 1{,}900) \times \{(b \times c)/(65{,}250 - a) + 1\}\} \times d \times 1.5$
$Y = (b \times e + (a + 1{,}900) \times \{(b \times c)/(65{,}250 - a) + 1\} \times (e/c)\ \} \times 1.5$

Notes:

- In the $\{(b \times c)/(65{,}250 - a) + 1\}$ calculation, the part below the decimal point is discarded.
- Discard fractions from the result of the (e/c) calculation.

Following are the meanings of *a* to *e* in the formulas:

a: Size of the fixed part of each record that collects historical data. For details about the fixed part of each record, see the chapter that describes Agent for NAS records in the *HiCommand Tuning Manager Hardware Reports Reference*.

b: Size of the variable part of each record that collects historical data. For details about the variable part of each record, see the chapter that describes Agent for NAS records in the *HiCommand Tuning Manager Hardware Reports Reference*.

c: Number of instances of each record that collects historical data (1 for a single instance record)

d: Number of stored records for each record that collects historical data (see *Note 1)*

e: Number of stored records for each record that collects historical data (see *Note 2*)

Note 1: For records of the PI record type, the collected data is summarized automatically over a certain fixed period (minute, hour, day, week, month, and year). Thus, you must take into consideration the number of records to be stored over the applicable period. Table A.90 lists the default values for the retention period and the number of records.

Note 2: For details about the number of stored records, see the chapter that describes management of the Store database, and the chapter that describes the properties of the Agent service in the *HiCommand Tuning Manager Agent Administration Guide*. Table A.91 lists the default for the number of records to be stored for each PD record type.

Table A.90 Default Values for Retention Period and Number of Records for PI Record Type

Data Type	Retention Period	Number of Records to Be Stored (when Collection Interval is 1 Minute)
Minute	1 day	1,440

Hour	7 days	168
Day	1 year	366
Week	1 year	52
Month	1 year	12
Year	No limit	(*years-collected*) x 1

Table A.91 Default Values for Number of Stored Records for Each PD Record Type

Record Name (Record ID)	Number of Records to Be Stored
Process Detail (PD)	864,000
Channel Node Configuration (PD_CHC)	120
Channel Node Platform Configuration (PD_CPC)	120
File System Configuration (PD_FSC)	147,600
File System Detail - Local (PD_FSL)	37,200
IP Address Configuration (PD_IAC)	37,200

A.7.6 Agent for Oracle

This section provides estimates of the amount of disk space required for Agent for Oracle.

A.7.6.1 Disk Space Requirements for the Entire System

Table A.92 Agent for Oracle Disk Space Requirements for the Entire System

Status of Agent for Oracle	Disk Space Requirements (Megabytes)				
	Windows	HP-UX	HP-UX (IPF)	Solaris	AIX
During installation	28	126	548	130	212
Initial condition (see *Note*)	110	130	320	120	155
Operation	*a* + 32	a + 75	*a* + 286	*a* + 77	*a* + 118

Legend:

The disk space requirements for each installation directory is as follows:

a: Sum of the disk spaces for each instance
The disk space requirement for a single instance can be calculated as follows:
b + *c* + 18 (megabytes)
b: Disk space requirements for the Store database. For details about the disk space requirements for the Store database, see section A.7.6.4.
c: Disk space requirements for the `jpcOcollect` program. For details about the disk space requirements for the `jpcOcollect` program, see section A.7.6.3.

Note: The status in which a single instance of Agent for Oracle is set up and only System Stat Summary Interval (PI) records are specified for collection.

A.7.6.2 Disk Space Requirements for Each Installation Directory

Table A.93 Agent for Oracle Disk Space Requirements for Each Installation Directory

Directory Name	Status of Agent for Oracle	Disk Space Requirements (Megabytes)				
		Windows	HP-UX	HP-UX(IPF)	Solaris	AIX
system-drive	During installation	14	---	---	---	---
Installation directory for Tuning Manager series programs	During installation	14	---	---	---	---
	Initial condition (see *Note*)	110	---	---	---	---
	Operation	*a* + 32	---	---	---	---
`/opt`	During installation	---	125	291	127	208
`/opt/jp1pc`	During installation	---	125	291	127	208
	Initial condition (see *Note*)	---	194	385	196	280
	Operation	---	*a* + 137	*a* + 303	*a* + 139	*a* + 220

Legend:

The disk space requirements for each installation directory is as follows:

---: Not applicable
a: Sum of the disk spaces for each instance
The disk space requirement for a single instance can be calculated as follows:
b + *c* + 18 (megabytes)
b: Disk space requirements for the Store database. For details about the disk space requirements for the Store database, see section A.7.6.4.
c: Disk space requirements for the `jpcOcollect` program. For details about the disk space requirements for the `jpcOcollect` program, see section A.7.6.3.

Note: The status in which a single instance of Agent for Oracle is set up and only System Stat Summary Interval (PI) records are specified for collection.

A.7.6.3 Disk Space Requirements for the jpcOcollect Program

The following table describes the disk space requirements for the `jpcOcollect` program:

Table A.94 Disk Space Requirements for the jpcOcollect Program

Monitored Object	Disk Space Requirements for the jpcOcollect Program (Megabytes)				
	Windows	HP-UX	HP-UX(IPF)	Solaris	AIX
Oracle8	Not applicable	8	Not applicable	8	Not applicable
Oracle 8i	1	8	Not applicable	8	16
Oracle 9i	1	13	25	13	22
Oracle 10g	1	23	48	23	26

A.7.6.4 Disk Space Requirements for the Store Database

All records of one record type are stored in the same file in the Store database.

When performance data is stored in the Store database, several fields are added. Since the added fields are included in the disk space requirements, you do not need to re-estimate the disk space requirements.

- Fields commonly added to each record

  The table below shows the fields that are commonly added to each record.

Table A.95 Fields Commonly Added to Each Record

View Name	Manager Name	Description
Agent Host	DEVICEID	Name of the host where the Agent is running
Agent Instance	PROD_INST	Agent instance name
Agent Type	PRODID	Agent product ID
Date	DATE	Record creation date (GMT)
Date and Time	DATETIME	Combination of Date (DATE) and Time (TIME) fields
Drawer Type	DRAWER_TYPE	For records of the PI record type, the period in which data is summarized (minute, hour, day, week, month, year)
GMT Offset	GMT_ADJUST	Difference between Greenwich Mean Time and local time (in seconds)
Time	TIME	Record creation time (GMT)

- Fields added when summarizing PI record type data

These are fields whose names are either a View name or a Manager name, appended by the following character strings. The fields to be added when summarizing PI record type data are listed in the following table.

Table A.96 Fields Added When Summarizing PI Record Type Data

View Name	Manager Name	Description
View-name(Total)	*Manager-name*_TOTAL	Field total value
View-name(Total)	*Manager-name*_TOTAL_SEC	Field total value (utime type)
View-name(Max)	*Manager-name*_HI	Maximum field value
View-name(Min)	*Manager-name*_LO	Minimum field value

- Fields added when exporting data stored in the Store database by using the jpcctrl dump command

  The following fields are output when data stored in the Store database is exported using the jpcctrl dump command. These fields are the ones added when performance data is stored in the Store database. Do not use these fields for operations because they are for internal use by Agent for Oracle.

  - *Record-ID*_DATE_F
  - *Record-ID*_DEVICEID_F
  - *Record-ID*_DRAWER_TYPE_F
  - *Record-ID*_DRAWER_COUNT
  - *Record-ID*_DRAWER_COUNT_F
  - *Record-ID*_INST_SEQ
  - *Record-ID*_PRODID_F
  - *Record-ID*_PROD_INST_F
  - *Record-ID*_RECORD_TYPE
  - *Record-ID*_RECORD_TYPE_F
  - *Record-ID*_SEVERITY
  - *Record-ID*_SEVERITY_F
  - *Record-ID*_TIME_F
  - *Record-ID*_UOWID
  - *Record-ID*_UOWID_F
  - *Record-ID*_UOW_INST
  - *Record-ID*_UOW_INST_F
  - *Record-ID_Manager-name*_COUNT
  - *Record-ID_Manager-name*_SEC
  - *Record-ID_Manager-name*_MSEC

Note: When you use the jpcctrl backup or jpcctrl dump command, nearly twice the disk space that is calculated from the table below will be required for a backup file or export file.

Table A.97 shows the disk space requirements for the Store database, for each record type.

Table A.97 Disk Space Requirements for the Store Database

Record Type	Formula for Estimating Disk Space Requirements (Bytes)
PI record type	(*X*1 + ... + *X*a + 3,500 x *a*)
PD record type	(*Y*1 + ... + *Yb* + 700 x *b*)

Legend:

X: Disk space for each record of the PI record type that collects historical data
X can be calculated by the following formula:
$X = \{d \times e + (c + 1900) \times \{(d \times e)/(65{,}250 - c) + 1\}^{\text{Note 1}}\} \times f \times 1.5$

Y: Disk space for each record of the PD record type that collects historical data
Y can be calculated by the following formula:
$Y = \{d \times g + (c + 1900) \times \{(d \times e)/(65{,}250 - c) + 1\}^{\text{Note 1}} \times (g/e)^{\text{Note 2}}\} \times 1.5$

a: Number of records of the PI record type that collect historical data

b: Number of records of the PD record type that collect historical data

c: Size of the fixed part of each record that collects historical data (see *Note3*)

d: Size of the variable part of each record that collects historical data (see *Note 3*)

e: Number of instances for each record that collects historical data (1 for single instance record)

f: Number of stored records for each record that collects historical data (see *Note 4*)

g: Maximum number of stored records for each record that collects historical data (see *Note 5*)

Note 1: In the $\{(d \times e)/(65{,}250 - c) + 1\}$ calculation, the part below the decimal point is discarded.

Note 2: In the (g/e) calculation, the decimal part is discarded.

Note 3: For details about the sizes of the fixed and variable parts of each record, see the chapter that describes Agent for Oracle records in the *HiCommand Tuning Manager Application Reports Reference*.

Note 4: For records of the PI record type, the collected data is summarized automatically over a certain fixed period (minute, hour, day, week, month, and year). Thus, you must take into consideration the number of records to be stored over the applicable period. The following table lists the default values for the retention period and the number of records.

Table A.98 Default Values for Retention Period and Number of Records for PI Record Type

Data Type	Retention Period	Number of Records to Be Stored (when Collection Interval is 1 Minute)
Minute-by-minute	1 day	1,440
Hourly	7 days	168
Daily	1 year	366

Weekly	1 year	52
Monthly	1 year	12
Yearly	Unlimited	(*years-collected*) x 1

Note 5: For details about the maximum number of stored records, see the chapter that describes management of the Store database, and the chapter that describes the properties of the Agent service in the *HiCommand Tuning Manager Agent Administration Guide*. The default number of records to be stored for records of each PD record type is 10,000.

A.7.7 Agent for Microsoft SQL Server

This section provides estimates of the amount of disk space required for Agent for Microsoft SQL Server.

A.7.7.1 Disk Space Requirements for the Entire System

The disk space requirements for Agent for Microsoft SQL Server depend on the file sizes of the following data.

- Common message log
- Internal trace log (system log)
- Internal trace log (for Agent for Microsoft SQL Server)
- Agent Store database
- Number of instances of Agent for Microsoft SQL Server

The maximum file size of the internal trace log is 16 MB for each instance of Agent for Microsoft SQL Server. The maximum file size of the internal trace log for common components outside of Agent for Microsoft SQL Server is also 16 MB.

Table A.99 shows the disk space requirements for installation and operation, based on the above.

Table A.99 Agent for Microsoft SQL Server Disk Space Requirements for the Entire System

Status of Agent for Microsoft SQL Server	Disk Space Requirements (Megabytes)
During installation	26
Operating under initialized conditions	110
Operation	25 + *a* + *b*

Legend:

a: Sum of the disk space for each instance

b: Disk space requirements for installation

The following formula shows how the disk space requirements for one instance is calculated:

c + 18

c: Disk space requirements for the Store database. For details, see section A.7.7.3.

A.7.7.2 Disk Space Requirements for Each Installation Directory

Table A.100 Agent for Microsoft SQL Server Disk Space Requirements for Each Installation Directory

Directory Name	Agent for Microsoft SQL Server Conditions	Disk Space Requirements (Megabytes)
system-drive	During installation	13
Installation directory for Tuning Manager series programs	During installation	13
	Operating under initialized conditions	110
	Operation	25 + *a* + *b*

Legend:

a: Sum of the disk space for each instance

b: Disk space requirements for installation

The following formula shows how the disk space requirements for one instance is calculated:

c + 18

c: Disk space requirements for the Store database. For details, see section A.7.7.3.

A.7.7.3 Disk Space Requirements for the Store Database

All records of one record type are stored in the same file in the Store database.

When performance data is stored in the Store database, several fields are added. Since the added fields are included in the disk space requirements, you do not need to re-estimate the disk space requirements.

- Fields commonly added to each record

  The table below shows the fields that are commonly added to each record.

Table A.101 Fields Commonly Added to Each Record

View Name	Manager Name	Description
Agent Host	DEVICEID	Name of the host where the Agent is running
Agent Instance	PROD_INST	Agent instance name
Agent Type	PRODID	Agent product ID
Date	DATE	Record creation date (GMT)
Date and Time	DATETIME	Combination of Date (DATE) and Time (TIME) fields.
Drawer Type	DRAWER_TYPE	For records of the PI record type, the period in which data is summarized (minute, hour, day, week, month, year)
GMT Offset	GMT_ADJUST	Difference between Greenwich Mean Time and local time (in seconds).
Time	TIME	Record creation time (GMT).

- Fields added when summarizing PI record type data

  These are fields whose names are either a View name or a Manager name, appended by the following character strings. The fields to be added when summarizing PI record type data are listed in the following table.

Table A.102 Fields Added When Summarizing PI Record Type Data

View Name	Manager Name	Description
View-name (Total)	*Manager-name*_TOTAL	Field total value
View-name (Total)	*Manager-name*_TOTAL_SEC	Field total value (utime type)
View-name (Max)	*Manager-name*_HI	Maximum field value
View-name (Min)	*Manager-name*_LO	Minimum field value

- Fields added when exporting data stored in the Store database by using the jpcctrl dump command

  The following fields are output when data stored in the Store database is exported using the jpcctrl dump command. These fields are the ones added when performance data is stored in the Store database. Do not use these fields for operations because they are for internal use by Agent for Microsoft SQL Server.

  - *Record-ID*_DATE_F
  - *Record-ID*_DEVICEID_F
  - *Record-ID*_DRAWER_TYPE_F
  - *Record-ID*_DRAWER_COUNT
  - *Record-ID*_DRAWER_COUNT_F
  - *Record-ID*_INST_SEQ
  - *Record-ID*_PRODID_F

- *Record-ID*_PROD_INST_F
- *Record-ID*_RECORD_TYPE
- *Record-ID*_RECORD_TYPE_F
- *Record-ID*_SEVERITY
- *Record-ID*_SEVERITY_F
- *Record-ID*_TIME_F
- *Record-ID*_UOWID
- *Record-ID*_UOWID_F
- *Record-ID*_UOW_INST
- *Record-ID*_UOW_INST_F
- *Record-ID_Manager-name*_COUNT
- *Record-ID_Manager-name*_SEC
- *Record-ID_Manager-name*_MSEC

Note: When you use the `jpcctrl backup` or `jpcctrl dump` command, nearly twice the disk space that is calculated from the table below will be required for a backup file or export file.

Table A.103 shows the disk space requirements for the Store database, for each record type.

Table A.103 Disk Space Requirements for the Store Database

Record Type	Formula for Estimating Disk Space Requirements (Bytes)
PI record type	X_1 + ... + X_i + 3,500 x *i*
PD record type	Y_1 + ... + Y_j + 700 x *j*

Legend:

X: Disk space for each record of the PI record type that collects historical data

The formula to calculate *X* is as follows:

$X = \{b \times c + (a + 1900) \times \{(b \times c) / (65{,}250 - a) + 1\}^{\text{Note 1}}\} \times d \times 1.5$

Y: Disk space for each record of the PD record type that collects historical data

The formula to calculate *Y* is as follows:

$Y = \{b \times e + (a + 1900) \times \{(b \times c) / (65{,}250 - a) + 1\}^{\text{Note 1}} \times (e/c)^{\text{Note 2}}\} \times 1.5$

i: Number of records of the PI record type that collect historical data

j: Number of records of the PD record type that collect historical data

a: Size of the fixed part of each record that collects historical data. For details about the size of the fixed part of each record, see the chapter that describes Agent for Microsoft SQL Server records in the *HiCommand Tuning Manager Application Reports Reference*.

b: Size of the variable part of each record that collects historical data. For details about the size of the variable part of each record, see the chapter that describes Agent for Microsoft SQL Server records in the *HiCommand Tuning Manager Application Reports Reference*.

c: Number of instances of each record that collects historical data (for a single instance record, 1)

d: Number of saved records for each record that collects historical data (see *Note 3*)

e: Maximum number of stored records for each record that collects historical data (see *Note 4*)

Note 1: Round down the decimal component of the result of the formula {(*b* x *c*) / (65,250 - *a*) + 1}.

Note 2: Round down the decimal component of the result of the formula (*e*/*c*).

Note 3: For records of the PI record type, the collected data is summarized automatically over a certain fixed period (minute, hour, day, week, month, and year). Thus, you must take into consideration the number of records to be stored over the applicable period. Table A.104 lists the default values for the retention period and the number of records.

Note 4: For details about the maximum number of stored records, see the chapter that describes management of the Store database, and the chapter that describes the properties of the Agent service in the *HiCommand Tuning Manager Agent Administration Guide*. The default number of records to be stored for records of each PD record type is 10,000.

Table A.104 Default Values for Retention Period and Number of Records for PI Record Type

Data Type	Retention Period	Number of Records to Be Stored (when Collection Interval is 1 Minute)
Minute-by-minute	1 day	1,440
Hourly	7 days	168
Daily	1 year	366
Weekly	1 year	52
Monthly	1 year	12
Yearly	No limit	(number of years collected) x 1

A.7.8 Agent for DB2

This section provides estimates of the amount of disk space required for Agent for DB2.

A.7.8.1 Disk Space Requirements for the Entire System

Table A.105 Agent for DB2 Disk Space Requirements for the Entire System

Status of Agent for DB2	Disk Space Requirements (Megabytes)	
	AIX	Linux
At installation	224	110
Operating under initialized conditions	118	65
Operation	*a* + 84	*a* + 36

Legend:

a: Sum of the disk spaces for each instance.

A.7.8.2 Disk Space Requirements for Each Installation Directory

Table A.106 Agent for DB2 Disk Space Requirements for Each Installation Directory

Directory Name	Status of Agent for DB2	Disk Space Requirements (Megabytes)	
		AIX	Linux
/opt	At installation	144	70
/opt/jp1pc	At installation	80	40
	Operating under initialized conditions	118	65
	Operation	*a* + 84	*a* + 36

Legend:

a: Sum of the disk spaces for each instance.

A.7.8.3 Disk Space Requirements for the Store Database

All records of one record type are stored in the same file in the Store database.

When performance data is stored in the Store database, several fields are added. Since the added fields are included in the disk space requirements, you do not need to re-estimate the disk space requirements.

- Fields commonly added to each record

  The table below shows the fields that are commonly added to each record.

Table A.107 Fields Commonly Added to Each Record

View Name	Manager Name	Description
Agent Host	DEVICEID	Name of the host where the Agent is running
Agent Instance	PROD_INST	Agent instance name
Agent Type	PRODID	Agent product ID
Date	DATE	Record creation date (GMT).
Date and Time	DATETIME	Combination of Date (DATE) and Time (TIME) fields.
Drawer Type	DRAWER_TYPE	For records of the PI record type, the period in which data is summarized (minute, hour, day, week, month, year)
GMT Offset	GMT_ADJUST	Difference between Greenwich Mean Time and local time (in seconds).
Time	TIME	Record creation time (GMT).

- Fields added when summarizing PI record type data

  These are fields whose names are either a View name or a Manager name, appended by the following character strings. The fields to be added when summarizing PI record type data are listed in the following table.

Table A.108 Fields Added When Summarizing PI Record Type Data

View Name	Manager Name	Description
View-name (Total)	*Manager-name*_TOTAL	Field total value
View-name (Total)	*Manager-name*_TOTAL_SEC	Field total value (utime type)
View-name (Max)	*Manager-name*_HI	Maximum field value
View-name (Min)	*Manager-name*_LO	Minimum field value

- Fields added when exporting data stored in the Store database by using the jpcctrl dump command

  The following fields are output when data stored in the Store database is exported using the jpcctrl dump command. These fields are the ones added when performance data is stored in the Store database. Do not use these fields for operations because they are for internal use by Agent for DB2.

  - *Record-ID*_DATE_F
  - *Record-ID*_DEVICEID_F
  - *Record-ID*_DRAWER_TYPE_F
  - *Record-ID*_DRAWER_COUNT
  - *Record-ID*_DRAWER_COUNT_F
  - *Record-ID*_INST_SEQ
  - *Record-ID*_PRODID_F
  - *Record-ID*_PROD_INST_F

- *Record-ID*_RECORD_TYPE
- *Record-ID*_RECORD_TYPE_F
- *Record-ID*_SEVERITY
- *Record-ID*_SEVERITY_F
- *Record-ID*_TIME_F
- *Record-ID*_UOWID
- *Record-ID*_UOWID_F
- *Record-ID*_UOW_INST
- *Record-ID*_UOW_INST_F
- *Record-ID_Manager-name*_COUNT
- *Record-ID_Manager-name*_SEC
- *Record-ID_Manager-name*_MSEC

Note: When you use the `jpcctrl backup` or `jpcctrl dump` command, nearly twice the disk space that is calculated from the table below will be required for a backup file or export file.

Table A.109 shows the disk space requirements for the Store database, for each record type.

Table A.109 Disk Space Requirements for the Store Database

Record Type	Formula for Estimating Disk Space Requirements (Bytes)
PI record type	(X_1 + ... + *Xa*+ 3,500 x *a*)
PD record type	(Y_1 + ... + *Yb* + 700 x *b*)

Legend:

X: Disk space for each record of the PI record type that collects historical data

X can be calculated by the following formula:

$X = \{d \times e + (c + 1{,}900) \times \{(d \times e)/(65{,}250 - c) + 1\}^{\text{Note 1}}\} \times f \times 1.5$

Y: Disk space for each record of the PD record type that collects historical data

Y can be calculated by the following formula:

$Y = \{d \times g + (c + 1{,}900) \times \{(d \times e)/(65{,}250 - c) + 1\}^{\text{Note 1}} \times (g/e)^{\text{Note 2}}\} \times 1.5$

a: Number of records of the PI record type that collect historical data

b: Number of records of the PD record type that collect historical data

c: Size of the fixed part of each record that collects historical data (see *Note3*)

d: Size of the variable part of each record that collects historical data (see *Note3*)

e: Number of instances for each record that collects historical data (1 for single instance record)

f: Number of stored records for each record that collects historical data (see *Note4*)

g: Number of stored records for each record that collects historical data (see *Note5*)

Note 1: In the {(*d* x *e*)/(65,250 - *c*) + 1} calculation, the part below the decimal point is discarded.

Note 2: In the (*g*/*e*) calculation, the decimal part is discarded.

Note 3: For details about the sizes of the fixed and variable parts of each record, see the chapter that describes Agent for DB2 records in the *HiCommand Tuning Manager Application Reports Reference*.

Note 4: For records of the PI record type, the collected data is summarized automatically over a certain fixed period (minute, hour, day, week, month, and year). Thus, you must take into consideration the number of records to be stored over the applicable period. Table A.110 lists the default values for the retention period and the number of records.

Note 5: For details about the number of stored records, see the chapter that describes management of the Store database, and the chapter that describes the properties of the Agent service in the *HiCommand Tuning Manager Agent Administration Guide*. The default number of records to be stored for records of each PD record type is 10,000.

Table A.110 Default Values for Retention Period and Number of Records for PI Record Type

Data Type	Retention Period	Number of Records to Be Stored (when Collection Interval is 1 Minute)
Minute-by-minute	1 day	1,440
Hourly	7 days	168
Daily	1 year	366
Weekly	1 year	52
Monthly	1 year	12
Yearly	No limit	(*years-collected*) x 1

A.8 Estimating Disk Space Requirements when Running in a Cluster System

For a cluster system, the calculation for disk usage is done in the same way as for a non-cluster system. For details, see section A.7.

Appendix B Structure of the Installation CD

The following table shows the structure of the Tuning Manager installation CD:

Table B.1 Structure of the Installation CD

Environment	Folder/Directory	Components Included	Installation Program Included
Windows	\ServerPart1	HiCommand Tuning Manager - Utilities	setup.exe
	\ServerPart2	▪ HiCommand Tuning Manager - Performance Reporter ▪ HiCommand Tuning Manager - Collection Manager ▪ HiCommand Suite Common Component ▪ HiCommand Tuning Manager - Tuning Service ▪ HiCommand Tuning Manager - Main Console ▪ Online help files for HiCommand Tuning Manager	setup.exe
Solaris	/ServerPart1	▪ HiCommand Tuning Manager - Utilities	install-ServerPart1.sh
	/ServerPart2	▪ HiCommand Tuning Manager - Performance Reporter ▪ HiCommand Tuning Manager - Collection Manager ▪ HiCommand Suite Common Component ▪ HiCommand Tuning Manager - Tuning Service ▪ HiCommand Tuning Manager - Main Console ▪ Online help files for HiCommand Tuning Manager	install-ServerPart2.sh

Appendix C Installation and Uninstallation Logs

The following table lists and describes the Tuning Manager installation logs.

Table C.1 Installation Logs

Environment	File Name	Contents	Storage Destination	Notes
Windows	`HiCommand Tuning Manager – CD1.log`	Log file used during the installation of Server Part 1	Temp folder (*Example:* `C:\Documents and Settings\Administrator\Local Settings\Temp`)	▪ If a file that has the same name already exists, the output contents are appended to that file. If not, a new file is created. ▪ These files remain undeleted even after Tuning Manager is uninstalled.
	`HiCommand Tuning Manager – CD2.log`	Log file used during the installation of Server Part 2		
Solaris	`htm-install-cd1.log`	Log file used during the installation of Server Part 1	`/tmp` directory	
	`htm-install-cd2.log`	Log file used during the installation of Server Part 2		

The following table lists and describes the Tuning Manager uninstallation logs.

Table C.2 Uninstallation Logs

Environment	File Name	Contents	Storage Destination	Note
Windows	`HiCommand Tuning Manager – CD1.log`	Log file used during the uninstallation of Server Part 1	Temp folder (*Example:* `C:\Documents and Settings\Administrator\Local Settings\Temp`)	▪ The output contents are appended to the existing log files. ▪ These files remain undeleted even after completion of the uninstallation.
	`HiCommand Tuning Manager – CD2.log`	Log file used during the uninstallation of Server Part 2		
Solaris	`htm-install-cd1.log`	Log file used during the uninstallation of Server Part 1	`/tmp` directory	
	`htm-install-cd2.log`	Log file used during the uninstallation of Server Part 2		

Appendix D Determining the Database Size for Tuning Manager

HiCommand Tuning Manager uses a HiRDB database. To determine the system requirements for server platforms, determine the size of the database used by Tuning Manager. During installation, specify the size of the database determined here.

The database size is based on the number of resources that Tuning Manager manages. According to the number of resources, the database scale is categorized as Small, Medium, or Large.

To determine the database size:

1. From the following resources, add the number of resources you want to monitor:
   - subnetworks
   - servers
   - file systems
   - device files
   - storage subsystems
   - storage ports
   - LDEVs
   - Array Groups
   - fabrics
   - fabric switches
   - switch ports
   - Oracle instances
   - tablespaces
   - data files
   - SLPRs
   - CLPRs
2. From Table D.1, select the database size for the total number of resources to be monitored.

Table D.1 Database Size for the Number of Resources to Be Monitored

OS	Database Size	Number of Resources to Be Monitored
Windows	Small	2000
	Medium	5000
	Large	16000
Solaris	Small	1600
	Medium	4000
	Large	8000

The following describes the conditions for using server functions when the Tuning Manager system is operated.

Note: The conditions for using the server functions and disk space requirements vary depending on the size of the database used by Tuning Manager.

Table D.2 shows the conditions for using the server functions:

Table D.2 Conditions for Using the Server Functions (New Installation)

OS	Database Size	Minimum Memory	Space Required for Installing a Tuning Manager System (See *Note 1*)	Database Space Used for Tuning Manager		Space required for installing HiCommand Suite Common Web Service (See *Note 4*)
				Max. Disk Space (See *Note 2*)	Checked Disk Space (See *Note 3*)	
Windows	Small	512 MB	1.8 GB	6.0 GB	1.0 GB	1.2 GB
	Medium	1024 MB	1.8 GB	6.0 GB	1.0 GB	
	Large	2048 MB	2.3 GB	8.0 GB	2.5 GB	

Solaris	Small	512 MB	0.8 GB	6.0 GB	1.0 GB	1.2 GB
	Medium	1024 MB		6.0 GB	1.0 GB	
	Large	2048 MB		8.0 GB	2.5 GB	

Note 1: In Solaris, 0.8 GB of extra space is temporarily required in the `/var/tmp/` directory during installation.

Note 2: The maximum disk space used by Tuning Manager.

Note 3: The minimum free disk space required for Tuning Manager operation. If the specified free disk space is not available, an error message is output.

Note 4: This is not necessary when other HiCommand Suite products using HiCommand Suite Common Component are installed.

Table D.3 Conditions for Using the Server Functions (Repair Installation)

OS	Database Size	Free Disk Space Required When Changing the Database Size Used by Tuning Manager (See *Note 1*)	
		Max. Disk Space (See *Note 2*)	Checked Disk Space (See *Note 3*)
Windows	No change	0 GB	0 GB
	Change from Small to Medium		
	Change from Small to Large	2.0 GB	1.5 GB
	Change from Medium to Large		
Solaris	No change	0 GB	0 GB
	Change from Small to Medium		
	Change from Small to Large	2.0 GB	1.5 GB
	Change form Medium to Large		

Note 1: When data is migrated from InterBase to HiRDB, 1.0 GB of extra space is temporarily required in the directory where the database is to be created.

Note 2: The maximum disk space used by Tuning Manager.

Note 3: The minimum free disk space required for Tuning Manager operation. If the specified free disk space is not available, an error message is output.

Table D.4 Conditions for Using the Server Functions (Upgrade Installation from Version 3.5 or Earlier)

OS	Database Size	Minimum Memory	Space Required for Installing a Tuning Manager System (See *Note 1*)	Database Space Used for Tuning Manager (See *Note 2*)		Space Required for Installing HiCommand Suite Common Web Service (See Note 5)
				Max. Disk Space (See *Note 3*)	Checked Disk Space (See *Note 4*)	
Windows	Small	512 MB	1.8 GB	6.0 GB	1.0 GB	1.2 GB
	Medium	1024 MB	1.8 GB	6.0 GB	1.0 GB	
	Large	2048 MB	2.3 GB	8.0 GB	2.5 GB	
Solaris	Small	512 MB	0.8 GB	6.0 GB	1.0 GB	
	Medium	1024 MB		6.0 GB	1.0 GB	
	Large	2048 MB		8.0 GB	2.5 GB	

Note 1: In Solaris, 0.8 GB of extra space is temporarily required in the `/var/tmp/` directory during installation.

Note 2: When data is migrated from InterBase to HiRDB, 1.0 GB of extra space is temporarily required in the directory where the database is to be created.

Note 3: The maximum disk space used by Tuning Manager.

Note 4: The minimum free disk space required for Tuning Manager operation. If the specified free disk space is not available, an error message is output.

Note 5: This is not necessary when other HiCommand Suite products using HiCommand Suite Common Component are installed.

Table D.5 Conditions for Using the Server Functions (Upgrade Installation from Version 4.0 or Later)

OS	Database Size	Database Space Used for Tuning Manager	
		Max. Disk Space (See *Note 1*)	Checked Disk Space (See *Note 2*)
Windows	No change	0 GB	0 GB
	Change from Small to Medium		
	Change from Small to Large	2.0 GB	1.5 GB
	Change from Medium to Large		
Solaris	No change	0 GB	0 GB
	Change from Small to Medium		
	Change from Small to Large	2.0 GB	1.5 GB
	Change form Medium to Large		

Note 1: The maximum disk space used by Tuning Manager.

Note 2: The minimum free disk space required for Tuning Manager operation. If the specified free disk space is not available, an error message is output.

Memory Requirements for Performance Reporter Operations

The memory requirements for Performance Reporter operations depend on the settings or usage conditions of Performance Reporter. The following are the minimum memory requirements:

- For Windows: 256 MB (512 MB in collaboration with Main Console)
- For UNIX: 512 MB

A general estimate of the memory requirements for Performance Reporter operations (in Windows or Solaris) is as follows: 64 MB

Note: This memory requirement applies to standard settings. Additional memory is required if multiple GUIs are opened simultaneously.

Disk Space Requirements for Performance Reporter Operations

To operate Performance Reporter, additional disk space (calculated by the formula below) is required.

The formula used to calculate disk space required for Performance Reporter operations (for Windows or Solaris): (*a***b***c*)MB

Legend:

a: The value of logFileNumber in `config.xml`

b: The value of logFileSize in `config.xml`

c: Number of subcommands used in the `jpcrdef`, `jpcasrec`, or `jpcaspsv` command (maximum: 7)

Appendix E System Limits

This section describes various limits (maximum values) of Tuning Manager series programs.

E.1 System Configuration

Following are the maximum values for a single Tuning Manager system:

- Maximum number of Tuning Managers: 1
- Maximum number of Agents: 200

  Note: If the system configuration consists of more than 200 Agents, create another Tuning Manager system.

E.2 Performance Reporter Display

One Performance Reporter can display a maximum of 10 report windows.

Appendix F Adjusting Kernel Parameters

F.1 Setting the Kernel Parameters Required for Tuning Manager (in Solaris)

Before installing the Tuning Manager server, you must set appropriate values for the kernel parameters (OS parameters) specified in `/etc/system`. If the kernel parameters have not been set correctly, installation fails.

When you uninstall the Tuning Manager, you must change the kernel parameters back to the previous settings specified before the installation of the Tuning Manager.

F.1.1 Setup Required Before Installing Tuning Manager

To set the values of the kernel parameters:

1. Back up the kernel parameters.

   Before changing kernel parameter settings, create a backup of the `/etc/system` file. After uninstalling Tuning Manager, you can use the backup to restore the previous kernel parameter settings.

2. Set the values of the kernel parameters.

   For the initial values for the OS, and the recommended values for HiCommand Suite Common Component, HiRDB, and Tuning Manager, see Table F.1 and Table F.2.

   Set the kernel parameters according to Table F.1, Table F.2, and the following formulas. (In the formulas, "Max {*x*, *y*, *z*}" means using the maximum value among *x*, *y*, and *z*.)

   Parameters other than shmsys:shminfo_shmmax:

   setting-value-of-the-kernel-parameter =

   user-specified-value-or-initial-value-of-the-OS +
   Max {*recommended-value-for-HiCommand-Suite-Common-Component* +
   recommended-value-for-Tuning-Manager +
   recommended-values-for-other-HiCommand-Suite-products,
   recommended-value-for-HiRDB}

   shmsys:shminfo_shmmax:

   setting-value-of-the-kernel-parameter =

   Max {*user-specified-value-or-initial-value-of-the-OS*,
   recommended-value-for-HiCommand-Suite-Common-Component +
   recommended-value-for-Tuning-Manager +
   recommended-values-for-other-HiCommand-Suite-products,
   recommended-value-for-HiRDB}

   For recommended values for other HiCommand Suite products, see the manual for each product.

   Caution: The maximum value of each kernel parameter must not exceed the value defined for the OS.

3. Execute the following command to restart the operating system:

```
shutdown -y -i6 -g0
```

Table F.1 and Table F.2 show the values used for calculating the kernel parameters.

Table F.1 Recommended Values for Kernel Parameters (For Solaris 8, Solaris 9)

Kernel Parameter	Initial Value for the OS	Recommended Value for HiRDB	Recommended Value for HiCommand Suite Common Component	Recommended Value for Tuning Manager
msgsys:msginfo_msgmni	50	0	32	12
msgsys:msginfo_msgtql	40	0	480	740
semsys:seminfo_semmni	10	1024	9	12
semsys:seminfo_semmns	60	7200	80	0
semsys:seminfo_semmnu	30	1024	0	0
semsys:seminfo_semume	10	512	0	0
semsys:seminfo_semmsl	25	128	0	0
semsys:seminfo_semopm	128	128	0	0
shmsys:shminfo_shmmax	8388608	200000000	319448	Small: 166912000 Medium: 433152000 Large: 966656000
shmsys:shminfo_shmmni	100	2000	0	0
shmsys:shminfo_shmseg (See *Note*)	6	240	0	0

Note: In Solaris 9 or later, the setting of this kernel parameter is not necessary. This parameter remains only when checking for compatibility with Solaris 8.

Table F.2 Recommended Values for Kernel Parameters (For Solaris 10)

Kernel Parameter	Initial Value for the OS	Recommended Value for HiRDB	Recommended Value for HiCommand Suite Common Component	Recommended Value for Tuning Manager
msgsys:msginfo_msgmni	128	0	32	12
msgsys:msginfo_msgtql	8192	0	480	740
semsys:seminfo_semmni	128	1024	9	12
semsys:seminfo_semmsl	512	128	0	0

semsys:seminfo_semopm	512	128	0	0
shmsys:shminfo_shmmax	A quarter of the physical memory	200000000	319448	Small: 166912000 Medium: 433152000 Large: 966656000
shmsys:shminfo_shmmni	128	2000	0	0

F.1.2 Setup Required After Uninstalling Tuning Manager

Put the /etc/system file, which was backed up before installing Tuning Manager, back into the original location.

It is not necessary to adjust kernel parameters for Agents other than Agent for Oracle.

F.2 Setting the Kernel Parameters Required for Agent for Oracle

When using Agent for Oracle, you must adjust the OS kernel parameters in order to allocate the resources required for execution processing. This section describes the kernel parameters that need to be adjusted for each OS.

For details about adjusting kernel parameters when using Tuning Manager in a UNIX environment, see Appendix F.1. Also, for details about adjusting kernel parameters when using DB2, see the DB2 documentation.

Note: You do not have to adjust the kernel parameters in AIX.

F.2.1 Adjusting HP-UX Kernel Parameters

Table F.2 Kernel Parameters That Require Adjustment (For HP-UX)

System Resource	Parameter	Estimate
File system	nfile	---
	nflocks	---
	maxfiles	---
Shared memory	shmmni	---
	shmmax	---
	shmseg	---

Semaphore	semmni	10 x *Number of instances when there are multiple instances*
	semmns	10 x *Number of instances when there are multiple instances*
	semume	---
	semmnu	---
Process	nproc	---
Memory	maxdsiz	---
	maxssiz	---

Legend:

---: An adjustment is not required for this parameter.

F.2.2 Adjusting Solaris Kernel Parameters

Table F.3 Kernel Parameters That Require Adjustment (For Solaris)

System Resource	Parameter	Estimate
Shared memory	shmsys:shminfo_shmmni	---
	shmsys:shminfo_shmmax	---
	shmsys:shminfo_shmseg	---
Semaphore	semsys:seminfo_semmni	10 x *Number of instances when there are multiple instances*
	semsys:seminfo_semmns	10 x *Number of instances when there are multiple instances*
	semsys:seminfo_semume	---
	semsys:seminfo_semmnu	---
Processor	maxuprc or max_nprocs	---

Legend:

---: An adjustment is not required for this parameter.

Appendix G Sample Shell Scripts for Starting, Stopping, and Monitoring in Solaris

When a cluster system is created in Solaris, the tools (or commands) used to perform starting, stopping, and monitoring from the cluster software must be registered.

The sample shell scripts described here define the commands to be registered in the cluster software. In these sample shell scripts, the commands to be registered in the cluster software are set so they can use the starting, stopping, and monitoring commands that are installed by each program product.

The method for checking whether a service registered in the cluster software is running correctly depends on the cluster software being used. In this Appendix, a combination of Solaris 9 and Sun Cluster 3.1 is used for sample shell scripts for starting, stopping, and monitoring. The sample shell script internally executes the installed commands.

Note: When one of the following sample shell scripts is used, the service-operation commands installed by each program product must be copied to the `/etc/init.d` directory. For details about how to copy these commands, see section 3.3.3.1.

When one of the following sample shell scripts is executed, an execution log file is created in the directory where the sample shell script is stored. The file name of the executed sample shell script is used as the log file name (extension: `log`). Each time a sample shell script is executed, logs are added to the log file and the file size increases. When operating Tuning Manager in a cluster configuration, delete any unnecessary logs.

G.1 HiCommand Suite Common Web Service

The following is a shell script for starting, stopping, and monitoring the HiCommand Suite Common Web service (`hicommand-CWS.sh`):

```
#!/bin/sh
#
# Sample hicommand-CWS.sh
#
# Usage: hicommand-CWS.sh [start|stop|check]
#
# This Script executes /etc/init.d/cluster_hicommand-CWS internally.

set -x
exec >> ./$0.log 2>&1
echo "#####" `date` "#####"

ALIVE_VALUE=0
DOWN_VALUE=1

exec_cmd() {
    echo `date "+%y/%m/%d %H:%M:%S " `"exec    : $*"
    # Execute Command with operand
    $*
    # Set return value to RC
    RC=$?
    echo `date "+%y/%m/%d %H:%M:%S " `"exec-end: $*  (RC=$RC)"
    if [ $RC -ne 0 ]; then
        if [ $RC -ne 1 ]; then
```

```
                exit $RC
        fi
    fi
}

# Switch operation according to the first operand of this shell.
case $1 in
start)
    exec_cmd "/etc/init.d/cluster_hicommand-CWS start"
    ;;
stop)
    exec_cmd "/etc/init.d/cluster_hicommand-CWS stop"
    ;;
check)
    /etc/init.d/cluster_hicommand-CWS check
    # The result is equal to 1
    if [ $? -eq 1 ]; then
        # running
        RET_CODE=$ALIVE_VALUE
    else
        # not running
        RET_CODE=$DOWN_VALUE
    fi
    exit $RET_CODE
    ;;
*)
    echo "Invalid argment"
    exit $DOWN_VALUE
esac

exit $ALIVE_VALUE
```

G.2 Tuning Service

The following is a shell script for starting, stopping, and monitoring Common Component for SOAP communication I/F (`hicommand-TS.sh`):

```
#!/bin/sh
#
# Sample hicommand-TS.sh
#
# Usage: hicommand-TS.sh [start|stop|check]

set -x
exec >> ./$0.log 2>&1
echo "#####" `date` "#####"

ALIVE_VALUE=0
DOWN_VALUE=1

exec_cmd() {
    echo `date "+%y/%m/%d %H:%M:%S " `"exec    : $*"
    $*
    RC=$?
    echo `date "+%y/%m/%d %H:%M:%S " `"exec-end: $*  (RC=$RC)"
    if [ $RC -ne 0 ]; then
        if [ $RC -ne 1 ]; then
                exit $RC
        fi
    fi
}

case $1 in
```

```
start)
    exec_cmd "/etc/init.d/cluster_hicommand-TS start"
    ;;
stop)
    exec_cmd "/etc/init.d/cluster_hicommand-TS stop"
    ;;
check)
    /etc/init.d/cluster_hicommand-TS check
    if [ $? -eq 1 ]; then
        # running
        RET_CODE=$ALIVE_VALUE
    else
        # not running
        RET_CODE=$DOWN_VALUE
    fi
    exit $RET_CODE
    ;;
*)
    echo "Invalid argment"
    exit 1
esac

exit $ALIVE_VALUE
```

G.3 Performance Reporter Service

The following is a shell script for starting, stopping, and monitoring Performance Reporter (`hicommand-PR.sh`):

```
#!/bin/sh
#
# Sample hicommand-PR.sh
#
# Usage: hicommand-PR.sh [start|stop|check]

set -x
exec >> ./$0.log 2>&1
echo "#####" `date` "#####"

ALIVE_VALUE=0
DOWN_VALUE=1

exec_cmd() {
    echo `date "+%y/%m/%d %H:%M:%S " `"exec    : $*"
    $*
    RC=$?
    echo `date "+%y/%m/%d %H:%M:%S " `"exec-end: $*  (RC=$RC)"
    if [ $RC -ne 0 ]; then
        if [ $RC -ne 1 ]; then
                exit $RC
        fi
    fi
}

case $1 in
start)
    exec_cmd "/etc/init.d/cluster_hicommand-PR start"
    ;;
stop)
    exec_cmd "/etc/init.d/cluster_hicommand-PR stop"
    ;;
check)
    /etc/init.d/cluster_hicommand-PR check
```

```
    if [ $? -eq 1 ]; then
        # running
        RET_CODE=$ALIVE_VALUE
    else
        # not running
        RET_CODE=$DOWN_VALUE
    fi
    exit $RET_CODE
    ;;
*)
    echo "Invalid argment"
    exit 1
esac

exit $ALIVE_VALUE
```

G.4 Tuning Manager Service

The following is a shell script for starting, stopping, and monitoring Tuning Manager (`hicommand-TM.sh`):

```
#!/bin/sh
#
# Sample hicommand-TM.sh
#
# Usage: hicommand-TM.sh [start|stop|check]

set -x
exec >> ./$0.log 2>&1
echo "#####" `date` "#####"

ALIVE_VALUE=0
DOWN_VALUE=1

exec_cmd() {
    echo `date "+%y/%m/%d %H:%M:%S " `"exec    : $*"
    $*
    RC=$?
    echo `date "+%y/%m/%d %H:%M:%S " `"exec-end: $*  (RC=$RC)"
    if [ $RC -ne 0 ]; then
        if [ $RC -ne 1 ]; then
                exit $RC
        fi
    fi
}

case $1 in
start)
    exec_cmd "/etc/init.d/cluster_hicommand-TM start"
    ;;
stop)
    exec_cmd "/etc/init.d/cluster_hicommand-TM stop"
    ;;
check)
    /etc/init.d/cluster_hicommand-TM check
    if [ $? -eq 1 ]; then
        # running
        RET_CODE=$ALIVE_VALUE
    else
        # not running
        RET_CODE=$DOWN_VALUE
    fi
    exit $RET_CODE
```

```
    ;;
*)
    echo "Invalid argment"
    exit 1
esac

exit $ALIVE_VALUE
```

G.5 Collection Manager Service

The following is a shell script for starting, stopping, and monitoring Collection Manager (`hicommand-CM.sh`):

```
#!/bin/sh
#
# Sample pfm_mgr.sh
#
# Usage: pfm_mgr.sh [start|stop|check]

LHOST=jp1sc
MONITOR_INTERVAL=60
ALIVE_VALUE=0
DOWN_VALUE=1

# PLAESE DO NOT CHANGE THIS VALUE
MONITOR_PROCESS="jpcnsvr jpcmm mgr/jpcsto jpcep jpctrap jpcvsvr jpcah"

exec_cmd() {
    echo `date "+%y/%m/%d %H:%M:%S " `"exec    : $*"
    $*
    RC=$?
    echo `date "+%y/%m/%d %H:%M:%S " `"exec-end: $*  (RC=$RC)"
    if [ $RC -ne 0 ]; then
        if [ $RC -ne 3 ]; then
            if [ $RC -ne 4 ]; then
                exit $RC
            fi
        fi
    fi
}

case $1 in
start)
    exec_cmd "/opt/jp1pc/tools/jpcstart mgr lhost=$LHOST"
    exec_cmd "/opt/jp1pc/tools/jpcstart act lhost=$LHOST"
    ;;
stop)
    exec_cmd "/opt/jp1pc/tools/jpcstop act lhost=$LHOST"
    exec_cmd "/opt/jp1pc/tools/jpcstop mgr lhost=$LHOST"
    ;;
check)
    for i in ${MONITOR_PROCESS}; do
        ps -ef | grep "$i ${LHOST}" | grep -v grep 1> /dev/null 2>&1
        if [ $? -eq 1 ]; then
            exit $DOWN_VALUE    # down
        fi
    done
    exit $ALIVE_VALUE    # alive
    ;;
monitor)
    while true
    do
        for i in ${MONITOR_PROCESS}; do
```

```
            ps -ef | grep "$i ${LHOST}" | grep -v grep 1> /dev/null 2>&1
            if [ $? -eq 1 ]; then
                exit $DOWN_VALUE    # down
            fi
        done
    sleep $MONITOR_INTERVAL    #alive
    done
    ;;
clean)
    exec_cmd "/opt/jp1pc/tools/jpcstop all lhost=$LHOST kill=immediate"
    ;;
*)
    echo "Invalid argment"
    exit 1
    ;;
esac

exit 0
```

G.6 HiRDB Service

The following are shell scripts for starting, stopping, and monitoring HiRDB (`hirdb_start.sh`, `hirdb_stop.sh`, `hirdb_probe.sh`):

G.6.1 Shell Script for Starting HiRDB (hirdb_start.sh)

```
#!/bin/sh

PATH=/usr/sbin:/usr/bin:$PDDIR/bin:.:/usr/cluster/bin
export PATH
PDDIR=/opt/HiCommand/Base/HDB
PDCONFPATH=$PDDIR/conf
LD_LIBRARY_PATH=$PDDIR/lib
PDHOST=logical-host-name
export PDDIR PDCONFPATH LD_LIBRARY_PATH PDHOST

$PDDIR/bin/pdstart

/etc/init.d/hirdb_probe.sh
```

G.6.2 Shell Script for Stopping HiRDB (hirdb_stop.sh)

```
#!/bin/sh

PATH=/usr/sbin:/usr/bin:$PDDIR/bin:.:/usr/cluster/bin
export PATH
PDDIR=/opt/HiCommand/Base/HDB
PDCONFPATH=$PDDIR/conf
LD_LIBRARY_PATH=$PDDIR/lib
PDHOST=logical-host-name
export PDDIR PDCONFPATH LD_LIBRARY_PATH PDHOST

$PDDIR/bin/pdstop -f
```

G.6.3 Shell Script for Monitoring HiRDB (hirdb_probe.sh)

```
#!/bin/sh

ps -ef | grep root | grep pdprcd | awk -F' ' '{print $8}' | grep pdprcd
if [ $? = 0 ];then
        echo "exit 0"
        exit 0
else
        echo "exit 1"
        exit 1
fi
```

Acronyms and Abbreviations

API	Application Program Interface
ASCII	American Standard Code for Information Interchange
CLPR	Cache Logical PaRtition
CPU	Central Processing Unit
CSV	Comma Separated Values
DHCP	Dynamic Host Configuration Protocol
DLPAR	Dynamic Logical Partitioning
DNS	Domain Name System
DTD	Document Type Definition
EFCM	Enterprise Fabric Connectivity Manager
FQDN	Fully Qualified Domain Name
FS	File System
FTP	File Transfer Protocol
GUI	Graphical User Interface
GUID	Globally Unique Identifier
HA	High Availability
HACMP	High Availability Cluster Multi-Processing
HiRDB	Hitachi Relational Database
HTM	HiCommand Tuning Manager
HTML	HyperText Markup Language
HTTP	HyperText Transfer Protocol
ICMP	Internet Control Message Protocol
IIS	Internet Information Services
I/O	Input/Output
ID	Identifier, Identification
IP	Internet Protocol
IPF	Itanium® Processor Family
IPv4	Internet Protocol Version 4
IPv6	Internet Protocol Version 6
IPX	Internetwork Packet eXchange
LAN	Local Area Network
LU	Logical Unit
LUN	Logical Unit Number
MB	megabyte
MC/SG	MC/ServiceGuard
MIB	Management Information Base

MSCS	Microsoft Cluster Service
MTA	Message Transfer Agent
NAS	Network Attached Storage
NFS	Network File System
NIC	Network Interface Card
NNTP	Network News Transfer Protocol
OS	Operating System
RAID	redundant array of inexpensive disks
RPM	Red Hat Package Manager
SAN	Storage Area Network
SCSI	Small Computer System Interface
SLPR	Storage Logical PaRtition
SMP	Symmetric Multi Processor
SMT	Simultaneous Multi-Threading
SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
SPX	Sequenced Packet eXchange
SQL	Structured Query Language
SSO	Single Sign On
Sun Cluster	Sun Microsystems Sun Cluster
TCP	transmission control protocol
UDP	User Datagram Protocol
VCS	VERITAS Cluster Server
VLAN	Virtual Local Area Network
WINS	Windows Internet Name Service
WOW64	Windows on Windows 64
WWN	World Wide Name
WWW	World Wide Web
XML	Extensible Markup Language