

Hitachi Storage Command Suite Hitachi Tuning Manager Software

User's Guide

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Acronyms and Abbreviations

Glossary



Preface

This document describes how to use the Hitachi Tuning Manager.

This preface includes the following information:

- ☐ [Intended Audience](#)
- ☐ [Software Version](#)
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- ☐ [Document Organization](#)
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Notice: The use of Hitachi Tuning Manager and all other Hitachi Data Systems products is governed by the terms of your agreement(s) with Hitachi Data Systems.

Intended Audience

Tuning Manager is intended for the following users:

- System administrators
- Storage administrators
- Application developers
- System integrators
- Technology consultants
- System architects and capacity planners who rely on Hitachi Tuning Manager reports and forecasts

Software Version

This document revision applies to Hitachi Tuning Manager version 6.0.

Release Notes

Release notes can be found on the documentation CD or on the Hitachi Data Systems Support Portal: <https://extranet.hds.com/http://aim.hds.com/portal/dt>

Release notes contain requirements and more recent product information that may not be fully described in this manual. Be sure to review the release notes before installation.

Document Revision Level

Revision	Date	Description
MK-92HC022-0	November 2002	Initial Release
MK-92HC022-1	March 2003	Revision 1, supersedes and replaces MK-92HC022-0
MK-92HC022-2	September 2003	Revision 2, supersedes and replaces MK-92HC022-1
MK-92HC022-3	September 2003	Revision 3, supersedes and replaces MK-92HC022-2
MK-92HC022-4	November 2003	Revision 4, supersedes and replaces MK-92HC022-3
MK-92HC022-5	March 2004	Revision 5, supersedes and replaces MK-92HC022-4
MK-92HC022-6	June 2004	Revision 6, supersedes and replaces MK-92HC022-5
MK-92HC022-07	January 2005	Revision 7, supersedes and replaces MK-92HC022-6
MK-92HC022-08	May 2005	Revision 8, supersedes and replaces MK-92HC022-7
MK-92HC022-09	July 2005	Revision 9, supersedes and replaces MK-92HC022-8
MK-92HC022-10	December 2005	Revision 10, supersedes and replaces MK-92HC022-9

Revision	Date	Description
MK-92HC022-11	June 2006	Revision 11, supersedes and replaces MK-92HC022-10
MK-92HC022-12	August 2006	Revision 12, supersedes and replaces MK-92HC022-11
MK-92HC022-13	December 2006	Revision 13, supersedes and replaces MK-92HC022-12
MK-92HC022-14	June 2007	Revision 14, supersedes and replaces MK-92HC022-13
MK-92HC022-15	September 2007	Revision 15, supersedes and replaces MK-92HC022-14
MK-92HC022-16	January 2008	Revision 16, supersedes and replaces MK-92HC022-15
MK-92HC022-17	August 2008	Revision 17, supersedes and replaces MK-92HC022-16

Document Organization

The following table provides an overview of the contents and organization of this document. Click the [chapter title](#) in the left column to go to that chapter. The first page of each chapter provides links to the e s s s in that chapter.

Chapter	Description
Overview of the Tuning Manager Series	Provides an overview of the Tuning Manager series.
Logging In to a Tuning Manager Server	Provides information about logging in to a Tuning Manager server.
Working with Reports from the Main Console	Describes the reports that are displayed by using the Main Console.
Working with Reports from Performance Reporter	Describes the reports that are displayed by using Performance Reporter.
Customizing Reports	Describes how to create user-defined reports with Performance Reporter.
Monitoring Operations Using Alarms	Describes how to use the GUI to set up alarms and how to set them to notify you of problems.
Monitoring Agents	Describes how to monitor operations of each Agent by using Performance Reporter.
Displaying Events	Describes how to use Performance Reporter to display events issued by Agents.
Analyzing a Performance Bottleneck	Describes how to analyze performance bottlenecks by using Tuning Manager server reports, and it provides an example analysis procedure.
Restrictions on the Tuning Manager Series	Describes the restrictions on the Tuning Manager series.
Functional Differences Between Tuning Manager Server Version 6.0 and 5.9	Describes the functional differences between Tuning Manager server version 6.0 and Tuning Manager server version 5.9.
Acronyms and Abbreviations	Defines the acronyms and abbreviations used in this document.
Glossary	Defines the special terms used in this document.

Referenced Documents

The following Hitachi referenced documents are also available for download from the Hitachi Data Systems Support Portal:

<https://extranet.hds.com/http://aim.hds.com/portal/dt>

Hitachi Storage Command Suite Documents:

- Hitachi Tuning Manager Server Administration Guide, MK-92HC021
- Hitachi Tuning Manager Agent Administration Guide, MK-92HC013
- Hitachi Tuning Manager Hardware Reports Reference, MK-95HC111
- Hitachi Tuning Manager Operating System Reports Reference, MK-95HC112
- Hitachi Tuning Manager Application Reports Reference, MK-95HC113
- Hitachi Tuning Manager Messages Reference, MK-95HC114
- Hitachi Tuning Manager Command Line Interface Guide, MK-96HC119
- Hitachi Tuning Manager Installation Guide, MK-96HC141

Document Conventions

This document uses the following typographic conventions:

Convention	Description
Bold	Indicates text on a window, other than the window title, including menus, menu options, buttons, fields, and labels. Example: Click OK .
<i>Italic</i>	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: <i>copy source-file target-file</i> Note: Angled brackets (< >) are also used to indicate variables.
screen/code	Indicates text that is displayed on screen or entered by the user. Example: # pairedisplay -g oradb
< > angled brackets	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: # pairedisplay -g <group> Note: Italic font is also used to indicate variables.
[] square brackets	Indicates optional values. Example: [a b] indicates that you can choose a, b, or nothing.
{ } braces	Indicates required or expected values. Example: { a b } indicates that you must choose either a or b.
vertical bar	Indicates that you have a choice between two or more options or arguments. Examples: [a b] indicates that you can choose a, b, or nothing. { a b } indicates that you must choose either a or b.
<u>underline</u>	Indicates the default value. Example: [<u>a</u> b]

This document uses the following icons to draw attention to information:

Icon	Label	Description
	Note	Calls attention to important and/or additional information.
	Tip	Provides helpful information, guidelines, or suggestions for performing tasks more effectively.
	Caution	Warns the user of adverse conditions and/or consequences (e.g., disruptive operations).
	WARNING	Warns the user of severe conditions and/or consequences (e.g., destructive operations).

Convention for Storage Capacity Values

Storage capacity values for logical devices are calculated based on the following values:

- 1 KB (kilobyte) = 1,024 bytes
- 1 MB (megabyte) = 1024 kilobytes or $1,024^2$ bytes
- 1 GB (gigabyte) = 1024 megabytes or $1,024^3$ bytes
- 1 TB (terabyte) = 1024 gigabytes or $1,024^4$ bytes

Getting Help

The Hitachi Data Systems Support Center staff is available 24 hours a day, seven days a week. To reach us, please visit the support Web site for current telephone numbers and other contact information:

<http://www.hds.com/services/support/>. If you purchased this product from an authorized HDS reseller, contact that reseller for support.

Before calling the Hitachi Data Systems Support Center, please provide as much information about the problem as possible, including:

- The circumstances surrounding the error or failure.
- The exact content of any error message(s) displayed on the host system(s).

Comments

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

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Thank you! (All comments become the property of Hitachi Data Systems Corporation.)

Overview of the Tuning Manager Series

- ☐ [Managing Networked Storage](#)
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- ☐ [About the System Configuration](#)
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Managing Networked Storage

Today's complex IT environments often include dozens or even hundreds of application and database servers and various operating systems connected to terabytes of data, which reside on several classes (or tiers) of storage systems. Often the servers and storage are located on one or more storage area networks (SANs) connected by SAN switches or storage directors with hundreds of interconnected switch ports.

The Tuning Manager series is a real-time software monitor that you can use to check the current state of all the host, file system, database, SAN, and storage resources that are being used by an application. It lets you contrast data about the monitored resources with an historical view of the normal, baseline performance of those resources that was previously stored in the database. The ability to query a historical database for performance and capacity trend analysis for each component of the SAN enables you to easily correlate the current changes in performance with recent changes to the physical configuration, software, or workload, or with other environmental changes that might be causing changes in an application's performance.

The goal of every IT organization is to detect and resolve potential problems before they occur. The Tuning Manager series also enables you to define and continuously monitor and store critical performance and capacity thresholds, and to send warnings to the proper persons to alert them of potential problems before they occur.



Note: For the Tuning Manager server, the terms "resource" and "metric" have the following meanings:

- **Resource** indicates any object monitored by the Tuning Manager server.
 - **Metric** indicates any monitored performance or capacity data item.
-

The Tuning Manager Series

The Tuning Manager series is a solution that monitors, reports, and forecasts storage performance and capacity in the context of the entire storage network, including hosts, file systems, database applications, SAN switches, and the internal disk storage components of all tiers of storage systems. The Tuning Manager series periodically discovers the capacity and performance of storage devices, file systems, hosts, databases and network attached storage (NAS) devices. It then consolidates, analyzes, and reports on current performance, capacity, utilization, and historical and future usage trends, and it also notifies you of any predetermined threshold violations. The Tuning Manager server provides the information you need to make informed decisions and more efficiently operate your storage environment while taking the guesswork out of planning and budgeting for future growth. The Tuning Manager server's reports, charts, and other metrics help you to:

- Replace risky guesswork with fact-based decisions
- Identify all storage systems on the network and their current performance, capacity, and utilization
- Determine how many and what kind of servers exist on your whole network and its subnetworks, and the storage they are consuming
- Determine which storage systems are either under- or over-utilized or under- or over-allocated
- Quantify the total, used, and remaining capacities of file systems
- Detect and prevent capacity shortages by using alarms that are issued when thresholds are exceeded
- Detect potential performance bottlenecks by using alarms that are issued when thresholds are exceeded
- Identify the cause of application response time problems by monitoring and reporting the performance of all components in the path from the host and database application to the disk parity group
- Determine when to attach additional storage
- Understand the relationship between the host's file systems, logical devices, and corresponding physical storage components
- Understand the RAID configuration of the storage system associated with a host's file systems

The Tuning Manager series collects performance data from the operating systems installed on the servers and databases (such as Oracle®) connected to a SAN, as well as from storage subsystems.

The Tuning Manager server lets you display the collected performance data as described below, enabling you to easily manage the performance and configuration for each resource in a SAN environment:

- You can associate host information such as that about file systems and databases with port and storage subsystem information, and then display the information collectively (Figure 1-1).
- You can display the performance and capacity summary information as well as reports generated from the Main Console for the units selected in the tree shown below (Figure 1-2).

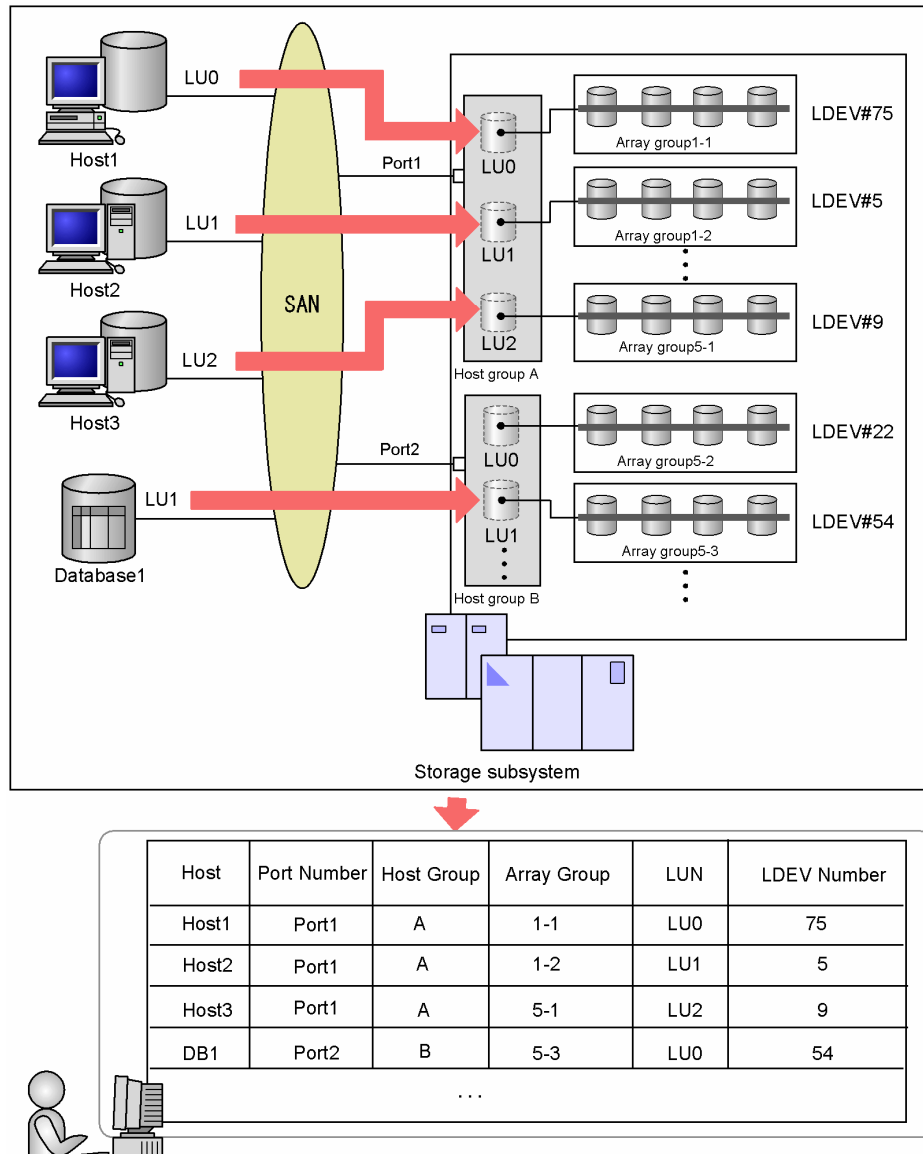


Figure 1-1 Associating Host Information with Port and Storage Subsystem Information

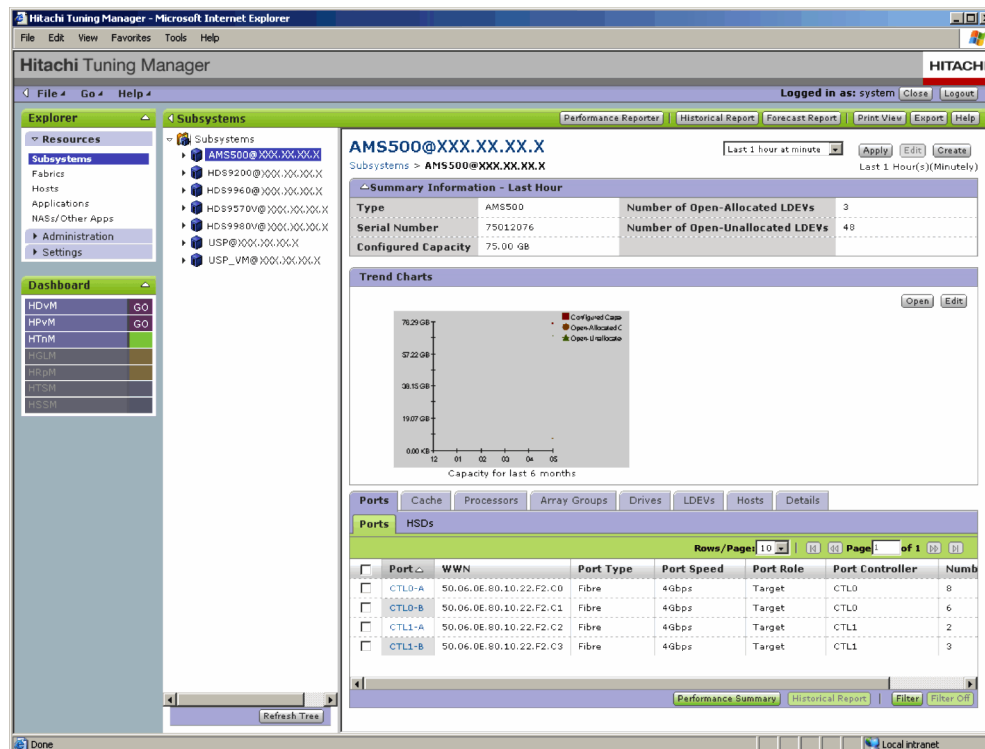
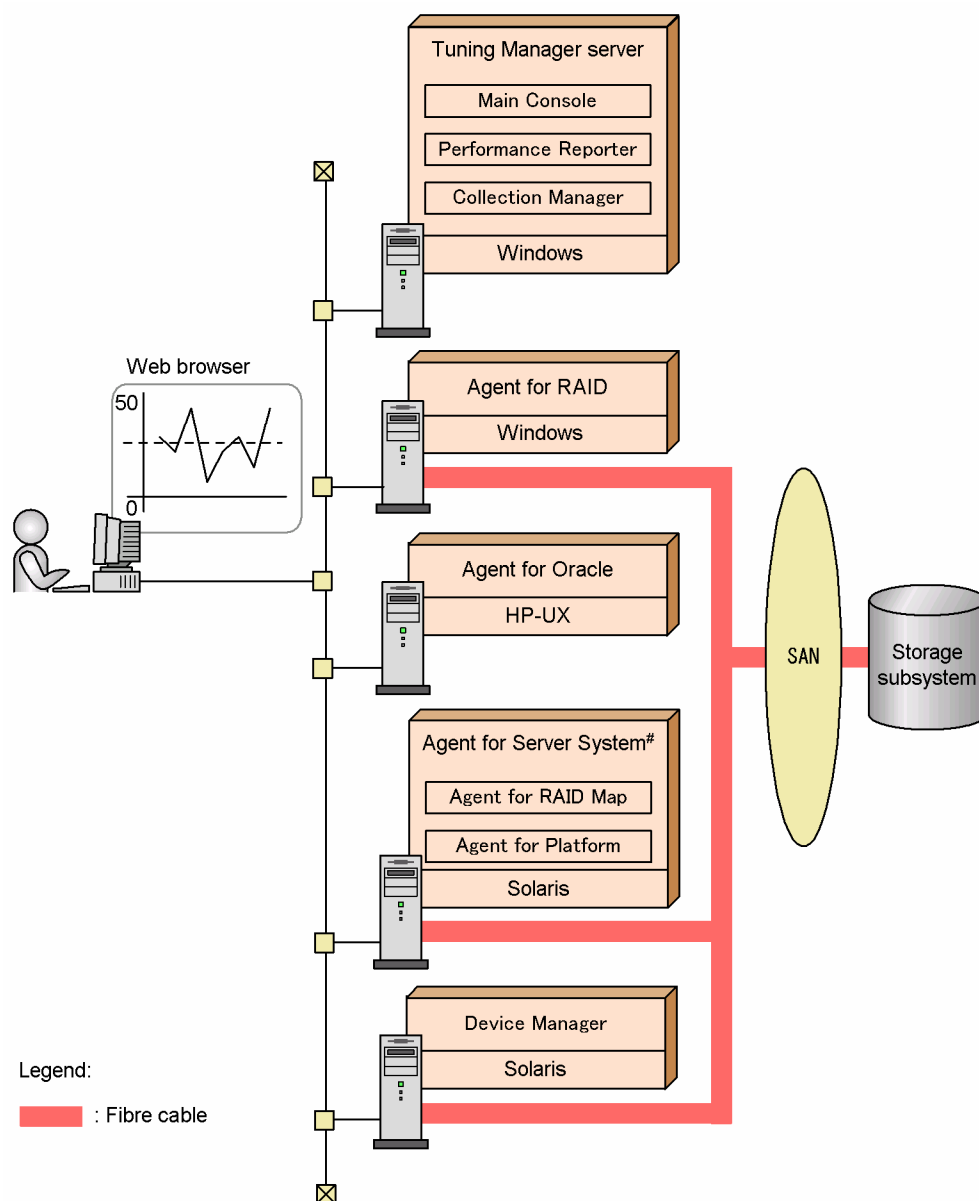


Figure 1-2 The Tuning Manager Server Resource Tree with a Storage Subsystem Selected

About the System Configuration

The Tuning Manager series is a series of software components that work together to monitor an entire network and collect performance data from the various systems. The Tuning Manager series consists of Agents that collect the performance data for each monitored resource and the actual Tuning Manager server, which manages all the Agents. Figure 1-3 shows an example of a system configuration.



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

Figure 1-3 Example Tuning Manager Series System Configuration

Agents: Agents manage, as monitored resources, Hitachi disk array subsystems, SAN switches, file systems on hosts, OSs, and Oracle and other applications according to their features. Also, Agents collect performance information (such as the I/O count per second) and capacity information (such as logical disk capacity) from these resources as performance data.

Device Manager: Device Manager collects and manages the configuration information of storage devices. Device Manager is a prerequisite product for the Tuning Manager server.

Tuning Manager server: The Tuning Manager server collects information from Device Manager and Agents, organizes the information into formats that suit the levels of monitored resources, and then displays the operating status of the system on the screen.



Note: This is only one possible configuration. In the simplest configuration, you can install and run all the Agents and Device Manager on the Tuning Manager server host. However, Agents that monitor OSs, databases, or applications must always be installed and running on the same machine as the monitored targets.

Figure 1-4 shows how the components of the Tuning Manager server work together to collect data.

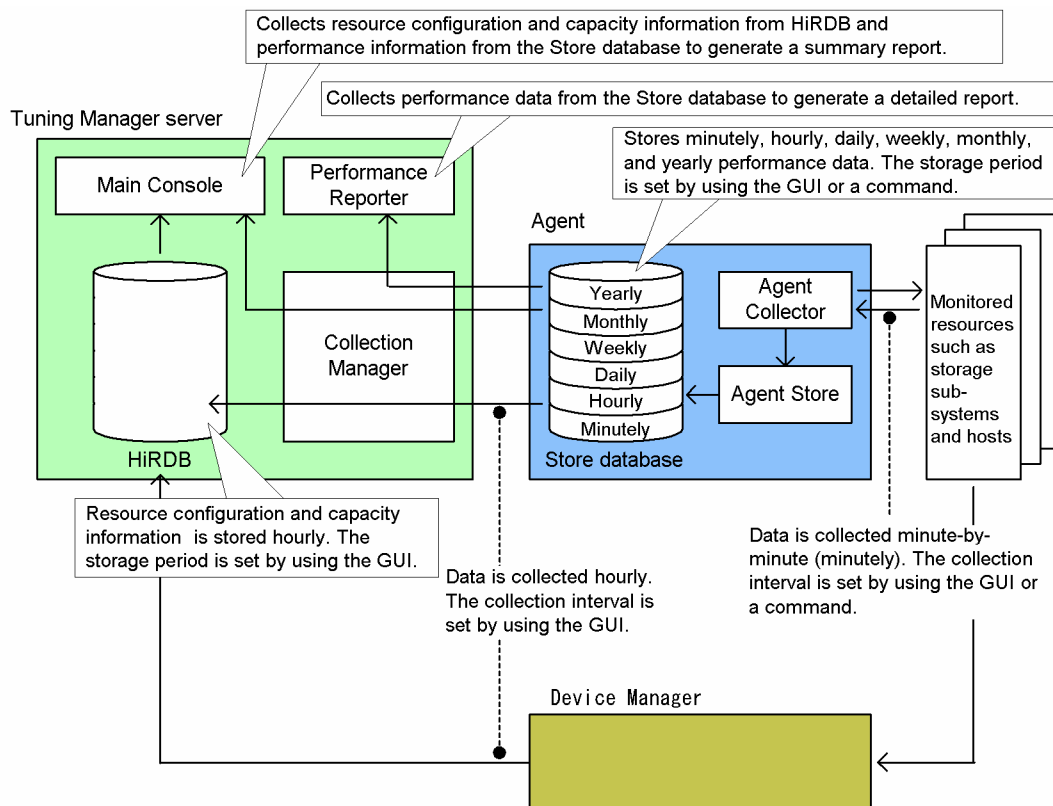


Figure 1-4 Data Collection Overview

Device Manager allows you to view the configuration of the storage subsystems added to the Device Manager system and perform configuration operations such as allocating storage or securing LUNs. Device Manager also allows you to quickly discover storage subsystems based on key attributes and efficiently manage complex, heterogeneous storage environments. In addition, you can use Device Manager to securely manage remote storage by means of SSL-based communication.

The Tuning Manager server uses the internal components of the Main Console and Collection Manager to collect data from Device Manager and Agents. You can display the collected data by using the Main Console and Performance Reporter. The role of each component can be summarized as follows:

Collection Manager: Collection Manager is the basic component of the Tuning Manager server and provides following functions:

- Managing Agents
- Managing events issued by Agents
- Controlling data transmission between a Tuning Manager server and Agents

Main Console: The Main Console stores the configuration and capacity information that the Agents and Device Manager collect from the monitored resources in the database. According to the specified time frame and interval, the Main Console displays reports in which the data accumulated in the database is mapped to the performance data managed by the Agents. The Tuning Manager server database is managed by the relational database system HiRDB.

The Main Console displays links to Performance Reporter.

Performance Reporter: Performance Reporter displays performance data collected directly from the Store database of each Agent and also provides a simple menu-driven method to develop your own custom reports. In this way, Performance Reporter enables you to display Agent-instance level reports and customized reports with a simple mouse click. Performance Reporter also enables you to display reports in which the current status of monitored targets is shown in real time. Performance Reporter does not connect to HiRDB.

Device Manager: Device Manager provides consistent, easy to use, and easy to configure interfaces for managing storage products. In addition to a command line interface (CLI) for scripting, Device Manager provides a Web-based GUI for managing storage products. Device Manager also provides maintenance commands for backing up and recovering the database that stores configuration information.

Agents: Agents run in the background and collect and record performance data. A separate Agent must exist for each monitored resource. For example, Agent for RAID is required to monitor storage subsystems, and Agent for Oracle is required to monitor Oracle. The Agents can continually gather hundreds of performance metrics and store them in the Store databases for instant recall. Agents enable the Tuning Manager server to collect the performance data of monitored objects. The collected data is used to display information about the entire SAN environment in the Main Console and information about specific resources in Performance Reporter. An Agent collects the performance data from a monitored OS, database (such as Oracle), or storage subsystem, and then stores the performance data in its database. Such databases are called Store databases, and each Agent manages one.

The following lists the different kinds of Agents and their functions:

Agent for RAID: Collects the performance data and configuration information of storage subsystems.

Agent for Server System: Agent for Server System consists of the following components:

- **Agent for RAID Map:** Maps the relationship between the servers and storage and collects configuration information about each host's file system and the corresponding storage subsystem's resources.
- **Agent for Platform (Windows[®], UNIX[®]):** Collects the performance data of servers, such as the operating status of the OS.
- **Agent for Microsoft[®] Exchange Server:** Collects performance data, such as the message transfer status of Exchange Server and the status of sent and received data.

Agent for SAN Switch: Collects performance data for switches.

Agent for Network Attached Storage: Collects performance data and configuration information about NAS systems.

Agent for Oracle: Collects the performance data of Oracle databases.

Agent for Microsoft SQL Server: Collects the performance data of Microsoft SQL Server databases.

Agent for DB2[®]: Collects the performance data of DB2 databases.



Note: A Tuning Manager server can manage a maximum of 400 Agent instances. By preparing multiple Tuning Manager server hosts, an administrator can distribute the Agent-management workload.

Distributed Metrics-Repository Architecture

Tuning Manager series programs have the capability to manage the large-scale infrastructures of storage environments: This capability is provided by a distributed metrics-repository architecture consisting of the Tuning Manager server database for trend-analysis and forecasting, and distributed Store databases deployed to each Agent for troubleshooting and deeper analysis. The Tuning Manager server database stores configuration and capacity information about resources, while the Store databases of Agents store mainly performance information.

A Tuning Manager server has two viewers: The Main Console, which allows you to view data retrieved from Device Manager and Agents from a perspective based on the storage environment, and Performance Reporter, which allows you to view real-time data and detailed data retrieved from each Store database.

Main Console

The Main Console allows you to view data retrieved from Device Manager and Agents so that you can pinpoint the sources of capacity and performance bottlenecks. The primary information displayed by the Main Console is as follows:

- Resource tree (hierarchy)
- Configuration and capacity summaries for each resource
- Performance summaries for each resource
- Comparisons of performance among resources
- List of connected resources (correlations between resources)
- Major metrics
- Direct links to resources

The Main Console is resource-focused (managed-object focused) and helps you find target resources and metrics. Reports and features of reports displayed by the Main Console are as follows:

- Summary reports and reports summarizing multiple resources (view of the entire system, display of a system overview, comparison analysis, and display of trends)
- One-click reports, which are available by selecting resources
- Trend reports on specific time ranges (You can specify a range by the minute, or on an hourly, daily, weekly, monthly, or yearly basis.)
- On-demand detailed reports, such as correlation reports or forecasting reports that are derived from summary reports, which are available by using a simple operation

Performance Reporter

Performance Reporter lets you view data retrieved from each Store database to analyze resources in detail. The main information displayed by Performance Reporter is detailed metrics collected by Agents and all metrics, including those that are not gathered in the Main Console.

Performance Reporter is metrics-focused and reports on the target metrics of a particular resource in detail. Following are the reports and features of reports that can be displayed:

- The definition of reports, display formats, and the time range of the data to be displayed is possible.
- Real-time display of metrics
- Ability to display a report of all the metrics collected by an Agent
- Multiple record output (range can be specified). You can choose to output records by the minute, hour, day, week, month, or year.

Roles of the Main Console and Performance Reporter

Before creating an environment and starting operations, you must read this section to understand the differences between the roles of the Main Console and Performance Reporter.

Monitoring and Analyzing the Operating Status of a System

You can use the Main Console to monitor the operating status of each resource in a format that suits the system configuration and resource level. In this way, the Main Console demonstrates its power for monitoring and analysis from a macro perspective.

On the other hand, you can use Performance Reporter to focus on and monitor the details of the operating status of each resource. In this way, Performance Reporter demonstrates its power for monitoring and analysis from a micro perspective. In addition, Performance Reporter provides the following monitoring functions:

- Monitoring and analyzing the operating status of applications other than NAS and Oracle
- Displaying metrics that are not displayed in the Main Console
- Displaying real-time reports

For details on monitoring operations by using the Main Console, see [Working with Reports from the Main Console](#).

For details on monitoring operations by using Performance Reporter, see [Working with Reports from Performance Reporter](#) and [Customizing Reports](#).

Using Alarms to Detect Problems that Affect Monitored Resources

The statuses of monitored resources that are operating generally change from hour to hour. Insufficient disk capacity, performance degradation due to I/O concentration on a specific volume, and similar issues can become critical problems that directly lead to system errors. To help prevent such problems, the Tuning Manager server can issue alarms to notify users when these problems become likely. This functionality is provided by Performance Reporter, which you can use to monitor the operating status details of monitored resources.

For details on setting and operating alarms, see [Monitoring Operations Using Alarms](#).

Using Alerts to Detect Problems that Affect Server Operations

A Tuning Manager server collects information required for its operations from Agents and Device Manager and manages the information in the Tuning Manager server database. If a problem occurs while collecting or managing information, continuing Tuning Manager server operations becomes difficult. To help prevent such problems, the Tuning Manager server can issue alerts to notify users when these problems become likely. This functionality is provided by the Main Console, which is the base of the Tuning Manager server.

For details on setting and operating alerts, see the *Hitachi Tuning Manager Server Administration Guide*.

Managing and Operating Agents

It is essential for Agents that collect performance data from monitored resources to operate normally. For the Tuning Manager server, it is also important to know which settings Agent operations are based on.

Functions for checking the operating status of Agents and for checking and changing Agent settings are provided by the Tuning Manager server. These functions are provided by Performance Reporter, which collects detailed information from Agents.

For details on monitoring the operating status of Agents, see [Monitoring Agents](#).

For details on checking or changing Agent settings, see the *Hitachi Tuning Manager Server Administration Guide*.

Reviewing the Managed Resources

The Tuning Manager server Main Console lets you view and analyze the capacity and performance of all storage systems and their ports, logical devices, and disk storage groups as viewed from the perspective of their associated servers, databases, and file systems. Figure 1-5 shows an example of the Main Console window displaying Performance Information when **Subsystems** is selected.

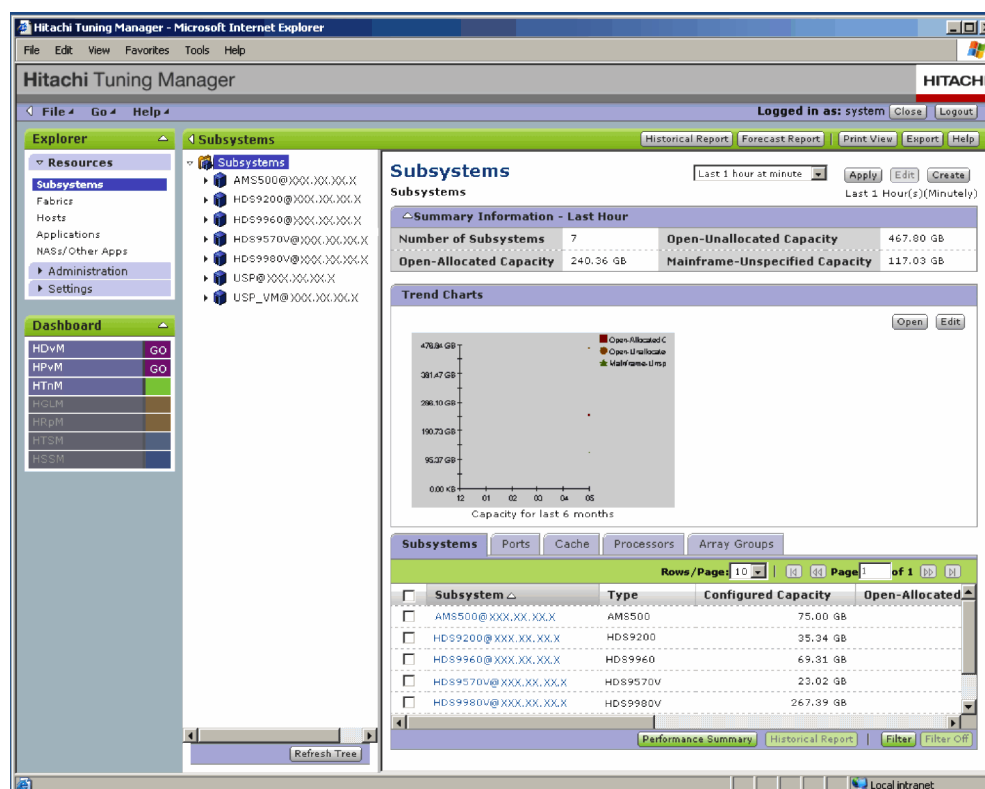


Figure 1-5 The Main Console Window when Subsystems is Selected

The left side of the Main Console window displays the Resource Tree, a hierarchical display with successive levels of detail about your network of servers, its subnetworks, hosts, storage, and applications. As you select each level in the tree, the metrics and charts about each selected resource and its related resources are displayed on the right side.

The displayed resources change depending on the selected resource category. Depending on the selected categories and resources, a combination of the following resources is displayed: hosts, subnetworks, servers, file systems, device files, storage, subsystems, SLPRs, ports, CLPRs, logical disks, whole fabrics, fabrics, switches, switch ports, Oracle, Oracle instances, and tablespaces.

The Main Console provides a bi-directional view of the resources on the network. With the Resource Tree and the many hyperlinks that are embedded in the Tuning Manager server reports, you can navigate through all of the resources in the network in either direction, up or down, or view the capacity or performance of each resource from different perspectives. As an example, you can display a disk array group in a particular storage system and then find and display the performance and capacity of all of the hosts, file systems, or Oracle instances associated with that group. Conversely, you can select a host, file system, or an Oracle instance, and then navigate down to display all of its associated storage, ports, logical devices, or disk array groups.

I/O Path

Figure 1-6 shows an example of the I/O path that applications use to access storage resources in a system. Tuning Manager obtains the performance data for each component along the path.

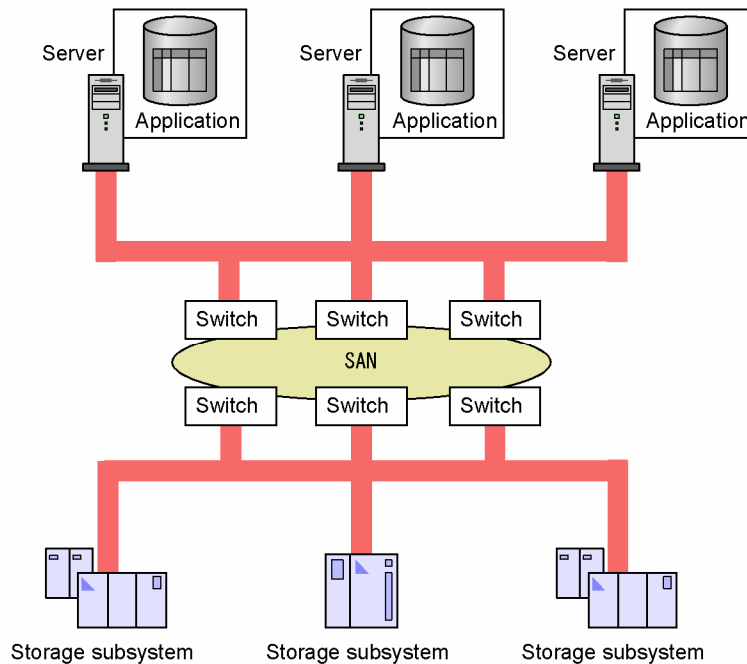


Figure 1-6 I/O Path Example

Figure 1-7 shows some of the corresponding metrics that can be viewed for each resource on the example I/O path. This example system is used in [Analyzing a Performance Bottleneck](#) to describe a bottleneck analysis procedure in Tuning Manager.

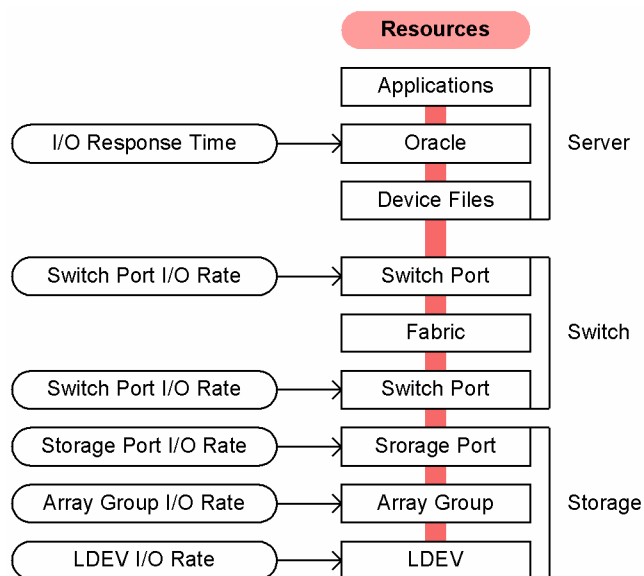


Figure 1-7 Resources to be Measured

The bi-directional view provided by the Main Console is essential when trying to determine the root cause of an application performance problem. For example, when the performance of an application on the Oracle application server shown above is slower than expected and you need to check if a bottleneck on the storage subsystem is causing the performance problem, you can use Tuning Manager to perform the following steps until you find the bottleneck and its cause. For a detailed description of the procedures involved in this example, see [Analyzing a Performance Bottleneck](#).

1. Identify server and device files based on the application name or database name.
2. Check the I/O performance of the device files, especially the I/O response time.
3. Determine whether the problem exists in a server, switch, or in storage.
4. Check the I/O performance of the storage ports for the device files.
5. Check the I/O performance of other servers connected to the same storage ports.
6. Determine which server is affecting the performance of the storage ports.
7. Check the I/O performance of the array group for the LDEV.
8. Check the I/O performance of other servers connected to the same array group.
9. Determine which server is affecting performance of the array group.
10. Check the I/O performance of the switch ports connected to the server.

Management Perspectives

With the bi-directional view provided by the Resource Tree you can navigate through all of the resources in the network in either direction, up or down, or view the capacity or performance of each resource from different perspectives. All the resources are categorized under five perspectives and displayed when **Resources** is selected in the explorer area: **Hosts** (for the entire network), **Storage**, **Fabrics**, **Applications**, and **NASs/Other Apps**. The following sections describe the level of analysis provided for each perspective.

Hosts Perspective

As shown in Figure 1-8, Tuning Manager analyzes hosts at the following resource levels, which are listed in descending order from most general to most detailed: Whole networks of storage servers, subnetworks of storage servers, servers (hosts), file systems, and device files.

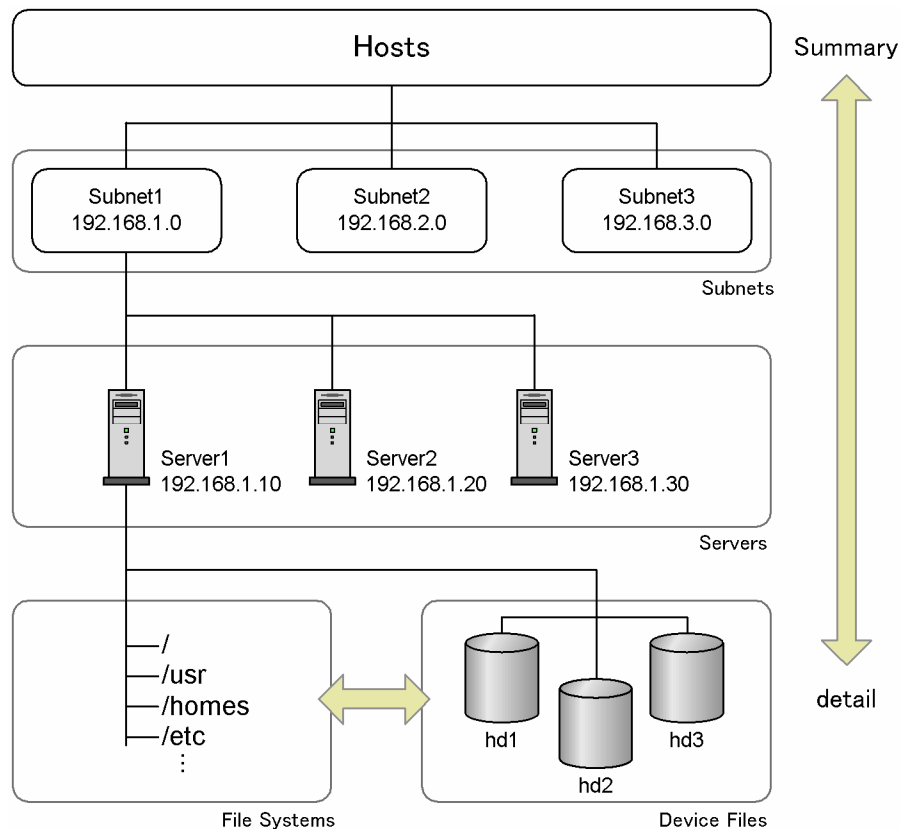


Figure 1-8 Hosts Resource Levels

Storage Perspective

As shown in Figure 1-9, Tuning Manager analyzes storage at the following resource levels, which are listed in descending order from most general to most detailed: storage, subsystems, ports, logical disks, and array groups.

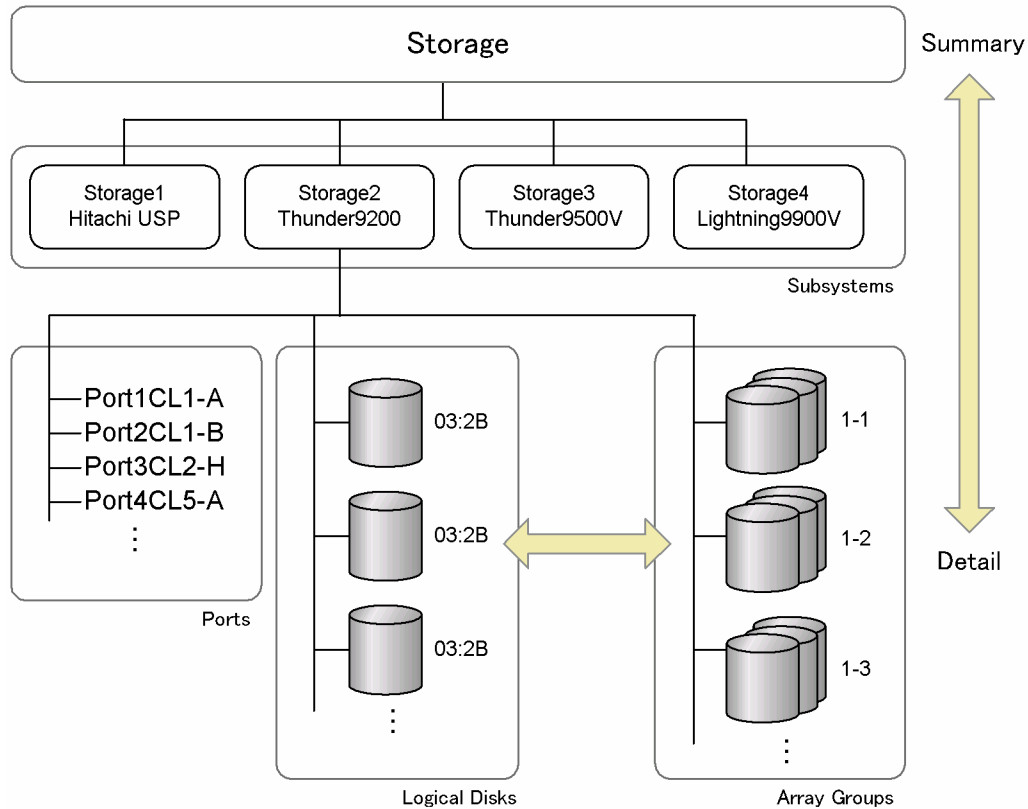


Figure 1-9 Storage Resource Levels

Fabric Perspective

As shown in Figure 1-10, Tuning Manager analyzes fabrics at the following resource levels, which are listed in descending order from most general to most detailed: whole fabrics, fabrics, SAN switches, and switch ports.

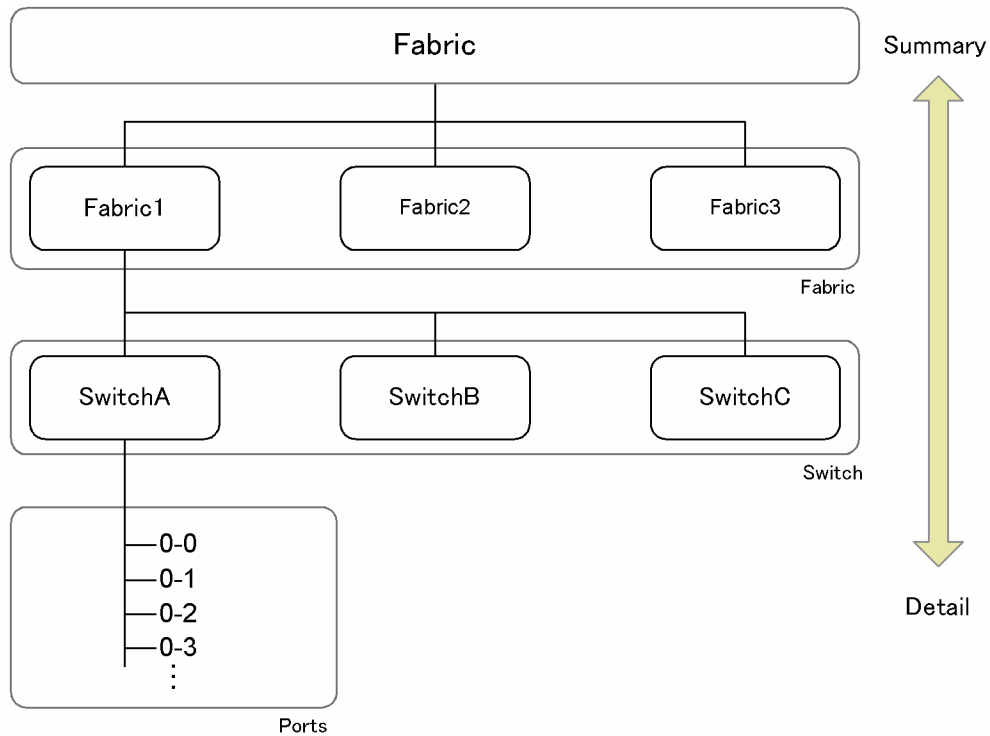


Figure 1-10 Fabric Resource Levels

Applications Perspective

As shown in Figure 1-11, Tuning Manager analyzes the capacity and performance of application (Oracle-related) resources at the following resource levels, which are listed in descending order from most general to most detailed: Oracle, Oracle instances, tablespaces, and data files.

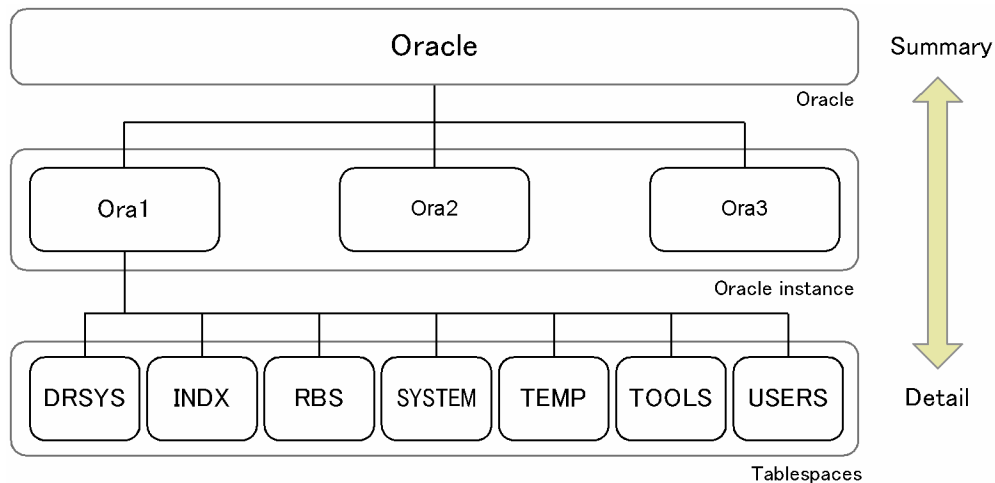


Figure 1-11 Application Resource Levels

NASs/Other Apps Perspective

Tuning Manager analyzes the capacity and performance of the NAS system in a storage subsystem and applications other than Oracle by narrowing down the targets to Agent instances. The NAS system and applications other than Oracle are displayed in the Resource Tree only when they are managed by a corresponding Agent as monitored targets. When a resource is selected in the navigation area, Performance Reporter is launched to display the information.

Reviewing the Data Model

Agents of the Tuning Manager series collect various types of performance data from the monitored targets in a record format and then store the data in their Store databases. Each record consists of smaller units called fields. Records and fields are collectively displayed in reports; this is called the data model.

Knowledge of the data model is not required when viewing reports generated from the Main Console, but such knowledge is required when you want to define your own reports. Records are classified into three types according to their characteristics. For details about the data model for each Agent, see the *Hitachi Tuning Manager Hardware Reports Reference*, *Hitachi Tuning Manager Operating System Reports Reference*, or *Hitachi Tuning Manager Application Reports Reference*. The record types that are used to collect performance data are predefined in each Agent in provided solution sets.

The record types are as follows:

- **Product Interval record type** (abbreviated as *PI record type*)
For records of the PI record type, Agents collect performance data for a specified interval, such as the number of processes in one minute. You can use these records to analyze changes or trends in the system status over time.
- **Product Detail record type** (abbreviated as *PD record type*)
For records of the PD record type, Agents collect performance data that indicates the system status at a specific point in time, such as detailed information about the currently active processes. You can use these records to obtain the system status at a particular time.
- **Product Log record type** (abbreviated as *PL record type*)
For records of the PL record type, Agents collect databases of information for logs and applications executed in UNIX. Only Agent for Platform (UNIX) can collect records of this type.

Each record name includes the record type abbreviation in the name. For example, the Device Detail (PD_DEV) record for Windows is a Product Detail type record that stores performance data indicating the status (at a specific point in time) of file system driver and kernel driver devices. In the record name, the string in parentheses (in this example, "PD_DEV") is the record ID. The fields contained in the Device Detail (PD_DEV) record are as follows: Active, Depend Group Name, Depend Service Name, Device Name, Device Type, Error Control, Group Name, Image Path, Interval, Object Name, Record Time, Record Type, Start Constant, and Tag.

Reviewing the Monitored Metrics

A Tuning Manager server collects, stores, and analyzes hundreds of metrics that are available to you for display in reports that you can also use to develop customized reports. Most of the metrics are available for real-time viewing, viewing historical trends, forecasting, and troubleshooting. For details about the meaning of each metric, see the [Glossary](#).

Each Tuning Manager server report contains a table of the metrics data available in the report. All of the reports generated from the Main Console can be easily modified. Additionally, the Tuning Manager server report generator, Performance Reporter, provides a simple, menu-driven method to develop your own custom reports and analysis by accessing the hundreds of real-time and historical metrics in the Agent data stores. After you understand the Tuning Manager server's reporting capabilities, you can begin to develop a plan for the ongoing monitoring of your key capacity and performance management metrics.

Reviewing the Reports

Tuning Manager server reports can be requested for a current real-time snapshot, any past point in time, or as a historical trend analysis over a specified time period. Also, you can use past trend analyses to forecast future trends. All of these reports can be customized, printed, or exported for use with other software tools.

Figure 1-12 shows an example of a report that indicates the number of LDEVs and LDEV configuration that can be used in a storage subsystem, and Figure 1-13 shows an example of the same report displayed when the targets are narrowed down to a specific LDEV.

When an LDEV report is displayed, you can check the configuration information of related resources in the information area (Correlation View). You can sort the items displayed in the information area (Correlation View) by clicking a column. You can also filter information so that only necessary information is displayed.

Also, you can use all of this data in other software applications because the data can be exported to a CSV file.

By using the Tuning Manager server, you can view the configuration, capacity, and performance information of all the servers on the network.

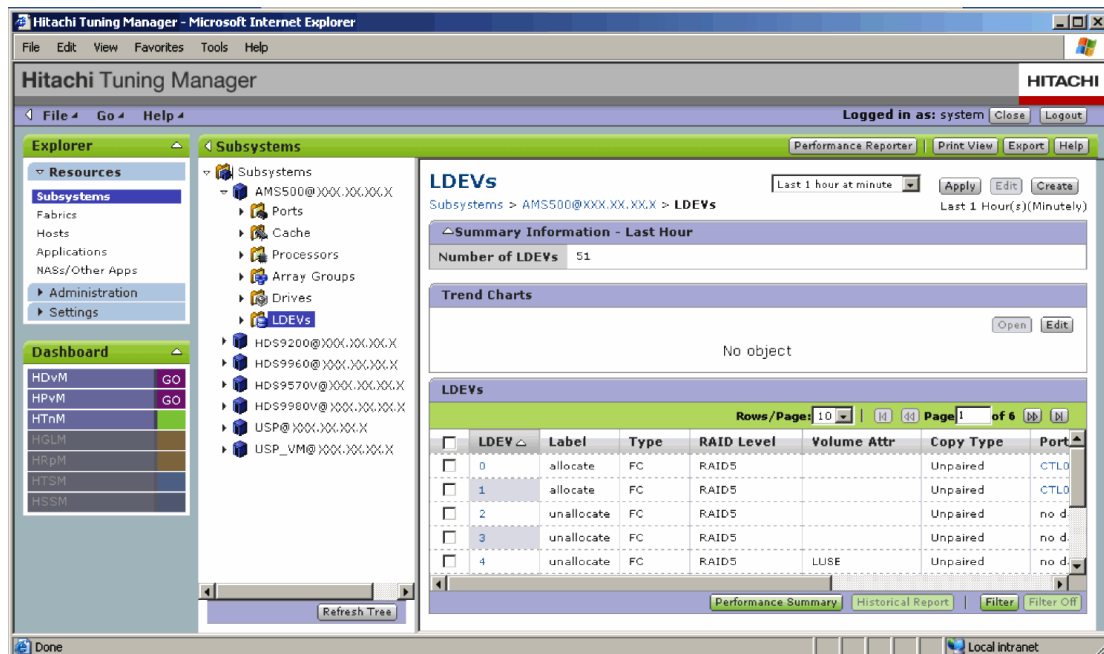


Figure 1-12 Number of LDEVs (Subsystems)

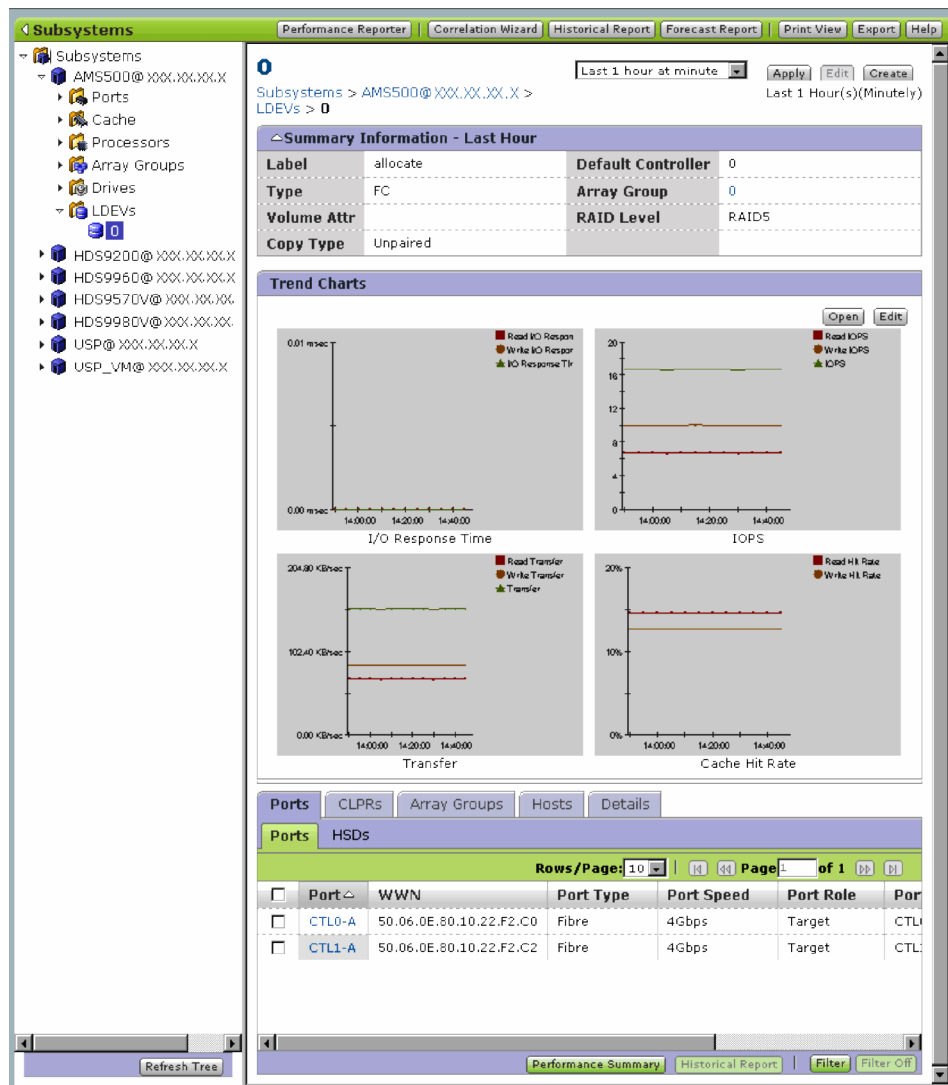


Figure 1-13 Report for a Specific LDEV



Note: The time frame and collection interval for the data to be displayed are specified in the Report window.

A detailed report on a related resource can be displayed from the information area (Correlation View) of the Main Console by clicking the **Performance Summary** or **Historical Report** button.

Reports Generated from the Main Console

Depending on the selected resources, the following reports can be generated from the report displayed in the Main Console:

Correlation Report: This report lists correlations of capacity and performance-related data collected from resources and related resources.

Historical Report: This report lists capacity and performance-related data collected from resources during the specified time period. A historical report can be registered and displayed in the information area (Embedded Custom Charts) of a report displayed in the Main Console as a favorite. The favorites functionality allows you to register frequently referenced graphs and display them quickly.

Forecast Report: This report forecasts future values based on the resource data collected in the latest records and the set interval. A forecast report can be registered and displayed in the information area (Embedded Custom Charts) of a report displayed in the Main Console as a favorite.

Trend Charts Report: This is a generic name of historical and forecast reports registered as favorites. A trend charts report is displayed in the information area (Embedded Custom Charts) of the Main Console as a thumbnail, and it can be displayed as a full-size image in another window.

Performance Summary Report: This report lists capacity and performance-related data for the resources related to the resource displayed in a report in the Main Console.

Figure 1-14 shows an example of a CLPR Performance report, which displays a chart indicating the Write Pending Rate.

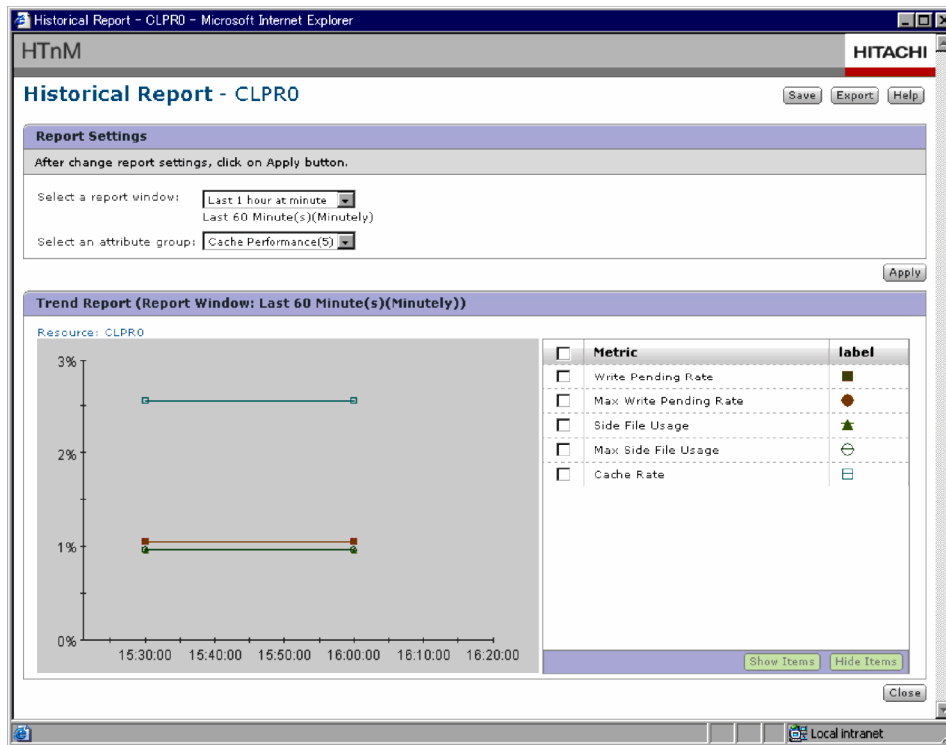


Figure 1-14 Performance: CLPR Performance

Reports generated from the Main Console share these attributes when displayed:

- The displayed time frame and the interval for which data is displayed are determined by the Report window settings.
- You can specify a setting to hide the data for each metric that is displayed in a graph.
- You do not need to specify display conditions for reports such as that shown in Figure 1-14 because such settings can be saved for each user.

Reports Generated from Performance Reporter

Performance Reporter reports become available when you click the **Performance Reporter** button in the application bar area of the Main Console or choose **Performance Reporter** from the **Go** menu in the global tasks bar area of the Main Console. When you start Performance Reporter by clicking the **Performance Reporter** button, the Performance Reporter main window appears with the top folder of the selected Agent displayed in the report folder tree. You can then open the folders and select the reports to be displayed. When you start Performance Reporter from the **Go** menu, the Performance Reporter main window is displayed. In this case, no Agent whose report is to be displayed is selected.



Note: For information about the components of the main window, see [Using the Main Window](#).

Performance Reporter directly collects information from the Store database of an Agent to display historical data, and directly accesses real-time data to display real-time data. A report in which historical data stored in a Store database is collected and displayed is called a historical report. A report in which real-time data is collected and displayed is called a real-time report. Real-time data is not stored in a Store database because the data is directly collected from the monitored targets when the Performance Reporter window is refreshed.

Historical reports display data from a specified interval of time, and real-time reports display temporarily collected, current data. You can select from any of the following three report types:

- **Historical report (single Agent):** Displays one Report window for each Agent. When multiple Agents are selected, the report displays as many windows as the number of Agents you have selected. A single-Agent historical report handles the following record types:
 - Single instance: Records that are recorded as one row each time data is collected. In Performance Reporter, each row in a record is called an instance.
 - Multiple instances: Records that are recorded as multiple rows each time data is collected. This can be useful, for example, in comparing data in the same field in multiple Agents.
- **Historical report (multiple Agents):** Displays all selected Agents in a single window, regardless of whether a single report or multiple reports are selected.
- **Real-time report (single Agent):** Displays current data, temporarily collected, for a single Agent. The collected values can be displayed in order and ranked. Note that past data cannot be obtained for display, because it is not stored in the Store database. Real-time reports (single Agent) support data from single-instance or multiple-instance records.

For more detailed information, you can display drilldown reports from primary reports. For example, you can select a date on a daily report and access an hour-by-hour report for that date. For details, see [Defining a Drilldown Report](#).



Note: Some reports displayed with Performance Reporter do not initially show graphs; however, you can easily add a graph to a report by copying the report from the provided system reports and then customizing it. For details about customizing reports, see [Defining Reports Using the Report Wizard](#).

Solution Sets

Each Agent provides a solution set containing predefined reports that have fields pre-selected for display of the reports. You can use Performance Reporter to select the reports from the solution set to define your own reports either by creating new reports or customizing the fields displayed in the reports of the solution set. The solution sets simplify the setup for monitoring the operating status of monitored objects.

The reports in a solution set are located in the folders that you open in Performance Reporter when you select the **Reports** tab and then select a folder in System Reports. The following example shows the reports available in the Monthly Trend folder of the solution set for Agent for Platform (Windows).

```
<Windows>
+-- <Operating System>
  +-- <Monthly Trend>
    | +-- CPU Trend
    | +-- CPU Trend (Multi-Agent)
    | +-- Memory Available Trend (Multi-Agent)
    | +-- Process Trend
    | +-- Server Activity Summary Trend (Multi-Agent)
    | +-- Server Sessions Trend (Multi-Agent)
    ...
```

Each report in a solution set displays information stored in the fields of a record. The fields of the record to be displayed are pre-defined for the report in its solution set. For example, the System Summary Overview (PI) record stores performance data, which is collected at specific intervals, about the entire system. The CPU Trend report in the solution set for UNIX uses fields of the System Summary Overview (PI) record (CPU %, Kernel CPU %, and User CPU %) to display the historical data on CPU usage for a specific host on a daily basis over the past month.

The System Summary Overview (PI) record stores many other metrics in fields and you can select those metrics to define your own reports. For details about the reports in the solution sets and the fields in the records provided with each Agent, see the *Hitachi Tuning Manager Hardware Reports Reference*, *Hitachi Tuning Manager Operating System Reports Reference*, or *Hitachi Tuning Manager Application Reports Reference*. For details about using a solution set to define a report, see [Customizing Reports](#).

User-defined Reports

You can use Performance Reporter and the solution sets provided by each Agent to define your own reports, which are displayed with Performance Reporter, and to collect metrics directly from each Agent's Store database. User reports make it easier to comprehensively analyze the operating status of objects being monitored by an Agent.



Note: Knowledge of the Tuning Manager server data model is required when you want to define your own reports. For a brief overview of the data model, see [Reviewing the Data Model](#). For details about the data model for each Agent, see the *Hitachi Tuning Manager Hardware Reports Reference*, *Hitachi Tuning Manager Operating System Reports Reference*, or *Hitachi Tuning Manager Application Reports Reference*.

Performance Reporter provides a wizard that you can use to define new reports. The wizard provides windows for selecting the type of report to be displayed with Performance Reporter, the metrics (referred to as fields in the data model) to be displayed in the report, the charts, related drilldown reports, and the time period for the data to be displayed in the report.

For details about defining a user report, see [Customizing Reports](#).

Avoiding Performance Problems

A Tuning Manager server can monitor thresholds that are set for the data collected by Agents. When the collected data reaches a threshold, the Tuning Manager server issues a warning to a user by sending an e-mail or executing a command. The user can take action upon receipt of the warning to prevent problems in operations.

The Tuning Manager server provides two types of warnings: Alerts and alarms.

- **Alert:** If a problem that affects Tuning Manager server operation occurs, the Tuning Manager server issues this type of warning in the following cases :
 - The number of failed polling attempts has reached the preset value.
 - Polling does not finish before the preset time period expires.
 - The percentage of the HiRDB RD area used by the Tuning Manager server has exceeded 85%.

You can use the Main Console GUI to specify the polling and alert issuance settings or check the alert issuance status. For details, see the *Hitachi Tuning Manager Server Administration Guide*.

- **Alarm:** If the data collected by Agents reaches the threshold set for report data that can be displayed by Performance Reporter, the Tuning Manager server issues this type of warning. You can use the GUI or CLI to specify how users are to be notified when the threshold has been reached.

Note that alarms can be issued in connection with the function for checking the operating status of Agents and the hosts on which the Agents are running (the health check function) provided by Tuning Manager series programs. For details, see the explanation of Tuning Manager series error detection in the *Hitachi Tuning Manager Agent Administration Guide*.

For details on alarms, see [Monitoring Operations Using Alarms](#) and the *Hitachi Tuning Manager Agent Administration Guide*.

About Setting and Using Alarms

To set alarms, the following methods are available:

- **Defining a new alarm table and alarms** This method creates an alarm table appropriate for the system environment and then defines alarms. You can add more alarms to the alarm table later.
- **Using an existing alarm table or alarms** The following methods are available:
 - **Using the solution set** The solution set is a group of preset alarms defining necessary information that is provided by each Agent. If you use a solution set, the alarms in the solution set that have been set so as to start alarm monitoring (active setting) take effect when the Agent starts.

- **Customizing a solution set** This method copies the solution set and then customizes the copy as appropriate for the system environment.
- **Using an existing alarm table or alarms** This method copies an existing alarm table or alarms and then customizes the copy.

To use alarms, you must associate (bind) an alarm table defined by one of the above methods to the applicable Agents. Figure 1-15 shows the general procedures for creating, setting, and using alarms.

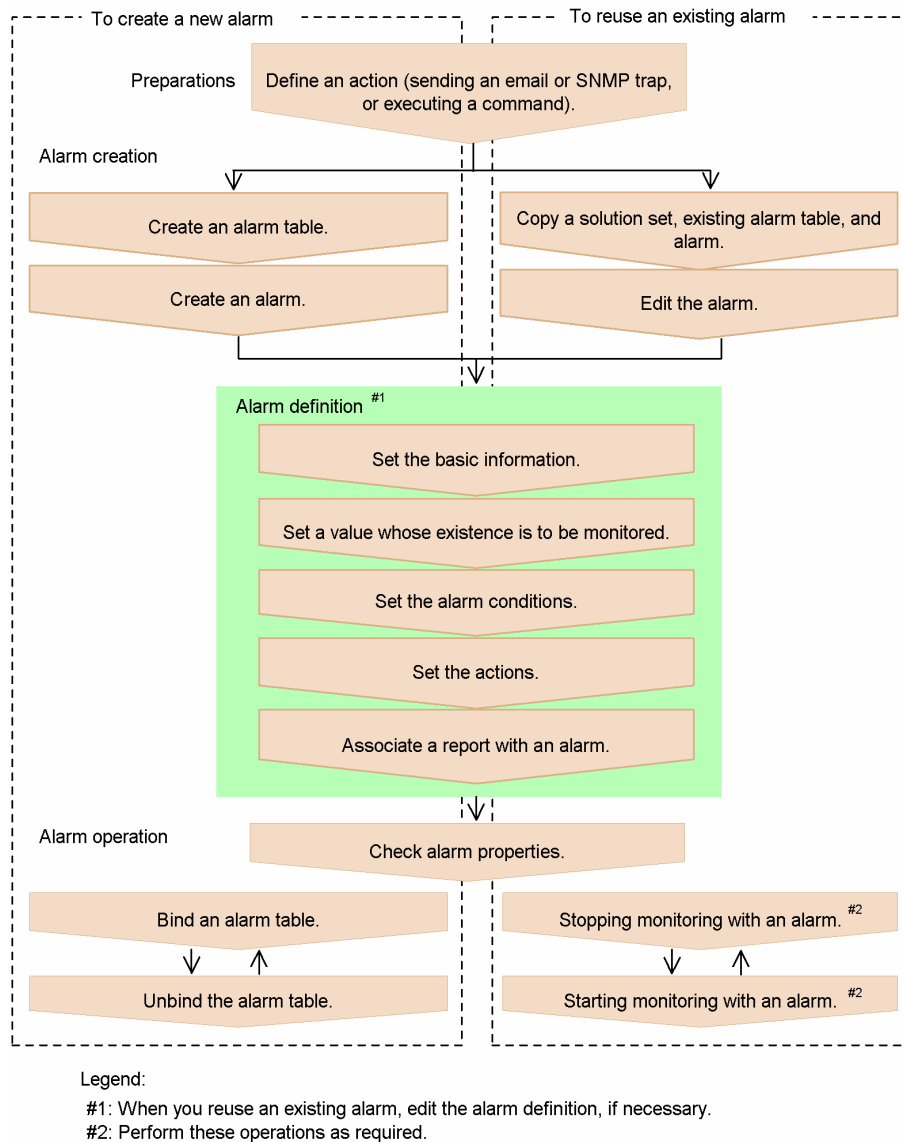


Figure 1-15 Procedures for Setting and Using Alarms

For additional details about alarms, see [Monitoring Operations Using Alarms](#) and the *Hitachi Tuning Manager Agent Administration Guide*.

Using Commands to Set and Use Alarms

Table 1-1 describes the commands for setting and using alarms. Note that you can also perform these operations from the GUI. For details about how to use the GUI to set and use alarms, see [Monitoring Operations Using Alarms](#). For details about the commands, see the *Hitachi Tuning Manager Command Line Interface Guide*.

Table 1-1 Overview of Commands for Setting and Using Alarms

Phase	Command name	Description
Preparations	jpcahprp update	- If you want to be notified by email when an alarm event occurs in an Agent, use this command to specify the email senders. - If you want a command to be executed automatically when an alarm event occurs in an Agent, use this command to change the Action Handler property on the host where the command is to be executed.
	jpctgprp create	If you want to send an SNMP trap when an alarm event occurs in an Agent, use this command to change the Trap Generator property.
Creating alarms	jpcalarm export	Outputs the template of an alarm definition file. If you want to create an alarm definition file without using the template, use this command to create an alarm definition file by following the syntax rules of an alarm definition file.
	jpcalarm check	Checks whether the contents of the created alarm definition file are valid.
Using alarms	jpcalarm bind	Binds an alarm table to an Agent.
	jpcalarm active	Activates an alarm.
Other	jpcalarm copy	Copies an alarm table or alarm.
	jpcalarm delete	Deletes an alarm table or alarm.
	jpcalarm import	Imports an alarm definition file.
	jpcalarm inactive	Inactivates an alarm.
	jpcalarm list	Displays the definition information of an alarm table or alarm, or displays binding information.
	jpcalarm unbind	Releases an alarm table bound to Agents.



Note: For details about the fields for which alarms are set and the alarms of solution sets, see the following manuals:

- *Hitachi Tuning Manager Hardware Reports Reference*
- *Hitachi Tuning Manager Operating System Reports Reference*
- *Hitachi Tuning Manager Application Reports Reference*

Solving Performance Problems

Agents continually gather hundreds of performance metrics and store them for instant recall, if required. [Analyzing a Performance Bottleneck](#) explains how the Main Console and Performance Reporter are used together to view metrics and solve performance problems.

Planning for System Monitoring

Figure 1-16 shows the workflow when planning system monitoring with Performance Reporter.

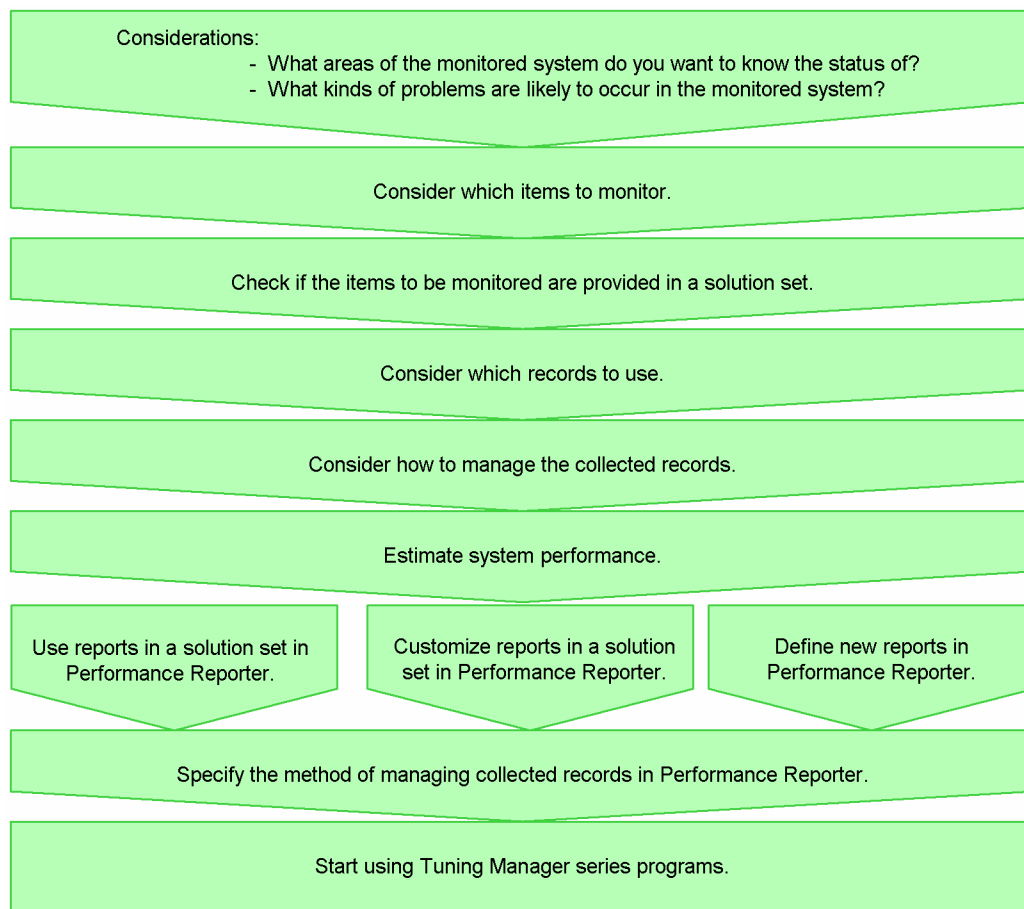


Figure 1-16 Planning How to Monitor Your System with Performance Reporter

The following steps provide additional details about the tasks that are outlined in Figure 1-16. We recommend that you follow this procedure to understand the status and potential challenges of a system to be monitored by the Tuning Manager series programs:

1. Carefully consider the following to gain an appropriate understanding of the detailed status and problems of a system to be monitored by Performance Reporter:
 - What areas of the monitored system do you wish to know the status of?
 - What kinds of problems are likely to occur in the monitored system?
2. Consider which items to monitor. To maintain an understanding of the status and problems of a monitored system, determine the items to monitor. For example, when a Windows host is used as a shared server, a scarcity of free space on a logical disk drive might cause the shared server to run abnormally. In this case, the monitoring item to select would be the ratio of free space on logical disk drives.
3. Check if the items to be monitored are provided in a solution set. The Tuning Manager series programs provide various sets of pre-defined reports called solution sets. Using Performance Reporter, solution sets can be displayed as graphs or tables. First, check if the item to be monitored is provided in a solution set.

For details about solution sets, see the chapter that describes solution sets in the *Hitachi Tuning Manager Hardware Reports Reference*, *Hitachi Tuning Manager Operating System Reports Reference*, or *Hitachi Tuning Manager Application Reports Reference*.

4. Consider which records to collect in order to understand the status of the items to be monitored. Increasing the number of records for which performance data is collected might adversely affect disk capacity and system performance. When configuring the records to be collected, specify only items that must be monitored, based on consideration of the requirements for collecting performance data, such as the required disk capacity and record collection interval.

For an overview of the records, see the chapter that describes the overview of data handled in Tuning Manager series programs in the *Hitachi Tuning Manager Agent Administration Guide*. For details about records, see the chapter that describes records in the *Hitachi Tuning Manager Hardware Reports Reference*, *Hitachi Tuning Manager Operating System Reports Reference*, or *Hitachi Tuning Manager Application Reports Reference*.

5. Consider how to manage the collected records. The required disk capacity differs depending on whether the collected records are stored in a Store database and, if so, the data recording format, save criteria, and so on. Before estimating system requirements, you must consider how the collected records will be managed.

For information about how to manage collected records, see the chapter that describes management of Store databases in the *Hitachi Tuning Manager Agent Administration Guide*.

6. Estimate system performance by considering the number of records to be collected, how they are to be managed, and so on.
7. Define reports based on the items to be monitored.
 - If a solution set contains settings that match the items to be monitored, use the solution set as is.
 - If a solution set contains settings that are similar to the items to be monitored, define reports by customizing the solution set to fit the environment being used.
 - You can also define new reports that are optimized for the environment being used.

For example, to monitor the ratio of free space on a logical disk drive on a Windows host, use the Free Space - Low 10 Logical Drives report in the solution set of Agent for Platform (Windows).

For details about defining and manipulating reports, see [Customizing Reports](#).

8. Configure the management of the collected records. Specify the following items, based on how the collected records will be managed, as determined in step 5.
 - Method to record data in the Store database.
 - Save criteria for the Store database.

For details about applying these settings, see the chapter that describes how to specify the recording methods and saving conditions for performance data in the *Hitachi Tuning Manager Agent Administration Guide*.

9. Start using Tuning Manager Series programs.

Using Reports to Manage Your System

1. Start Performance Reporter.
2. Collect performance data to analyze changes and trends in system status over time. For example, use the Free Space - Low 10 Logical Drives report of Agent for Platform (Windows) to collect performance data for the 10 logical drives of Windows hosts that have the least free space.
3. Display a historical report to understand the status and problems of the monitored device. For information about how to display a report, see [Working with Reports from Performance Reporter](#).
4. If needed, define and create new reports.
5. Analyze causes based on displayed reports.
6. Effectively use the monitoring results. You can use the monitoring results to prevent problems on monitored systems before they occur and to quickly isolate the causes of problems that do occur in these systems.

Using the Command Line Interface

The command line interface (CLI) provides a simple way to access Tuning Manager server data. The Tuning Manager server provides this access via the command line interface and command line programs suited for operation via a telnet connection over TCP/IP or for scripted operations.

Common ways to use the CLI are:

- Manually executing CLI programs on the command line of an operating system.
- Invoking CLI programs within scripts, macros, and development products. Perl, Microsoft Visual Basic, and Tcl are among the most common tools used for this purpose. Scripts enable you to integrate Tuning Manager server data and automate reporting. (Examples: scheduling execution of scripts and customizing reports by parsing or manipulating results)

Operating in a Cluster System

By using a cluster configuration, you can create a highly reliable system that continues to operate even if a system failure occurs. With such a configuration, Tuning Manager series programs can continue operation and monitoring 24 hours a day. Figure 1-17 shows an example of the simplest configuration for a cluster system.



Note: Agent for Server System (Agent for RAID Map, Agent for Platform, and Agent for Microsoft Exchange Server) can run on machines in a cluster configuration, but this Agent does not fail over. When a failover occurs in a cluster system, Agent for Server System continues operating on the physical host.

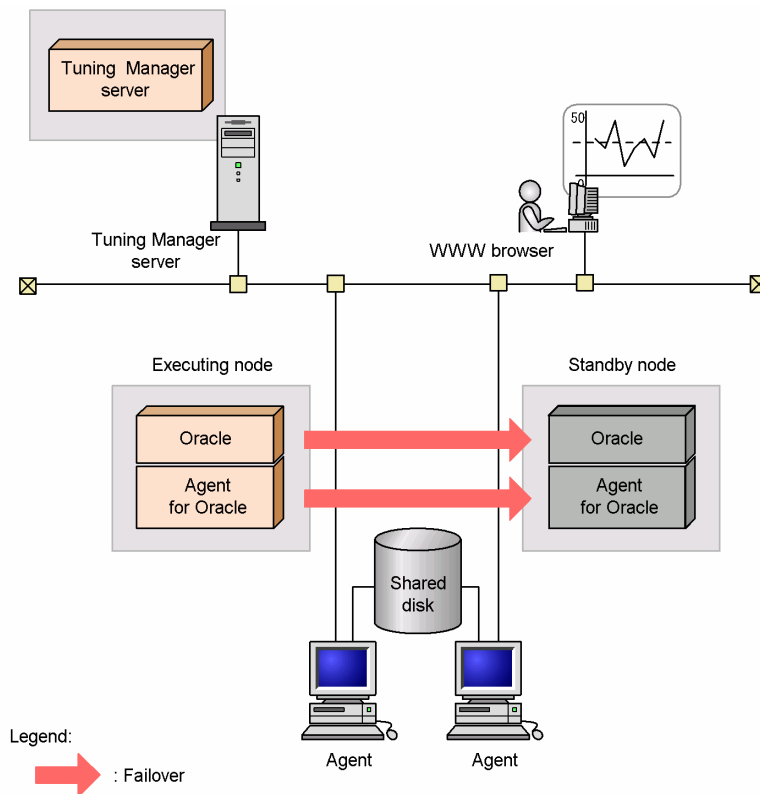


Figure 1-17 Example of a Cluster System

For a cluster configuration, you must set up two identical environments. One operates normally as the executing node, and the other operates during failure as the standby node. For details, see the *Hitachi Tuning Manager Server Administration Guide*, *Hitachi Tuning Manager Agent Administration Guide*, or *Hitachi Tuning Manager Installation Guide*.

Introducing the Graphical User Interface

This section describes the window structure, main components, and functions of the GUI (Graphical User Interface) that you operate to use functions provided by a Tuning Manager server. For details on each Tuning Manager server function related to the GUI components and the operation procedures, refer to the location of the documents indicated throughout this section.

For operations that the system administrator performs, such as setting up Tuning Manager server components, an interface other than the GUI is provided. For details, see the *Hitachi Tuning Manager Server Administration Guide*.

In addition to the GUI, the Tuning Manager server provides a CLI (Command Line Interface). For details on how to use the CLI, see the *Hitachi Tuning Manager Command Line Interface Guide*.

Using the Main Window

Following is an example of the structure of the main window and the functions that you can use in each frame.

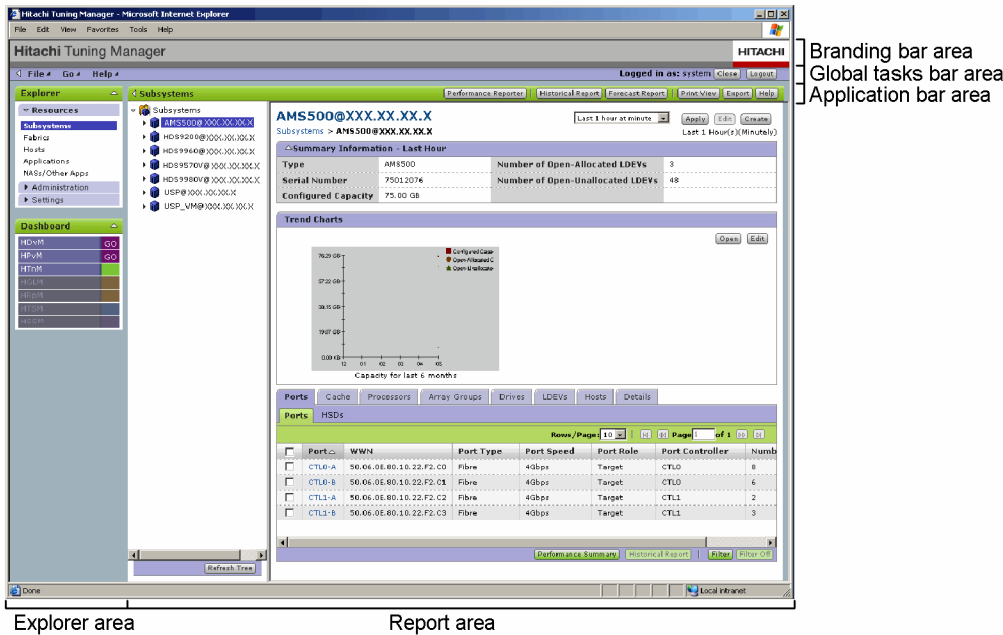


Figure 1-18 Components of the Main Window

Table 1-2 provides a brief description of each frame.

Table 1-2 Description of Frames

Frame	Description
Global tasks bar area (See Global Tasks Bar Area)	This area is used for operations such as launching Hitachi Storage Command Suite products and displaying the online Help.
Explorer area (See Explorer Area)	Consists of the Explorer menu and Dashboard menu. This area is used for operations such as displaying information for the selected item and launching Hitachi Storage Command Suite products.
Application bar area (See Application Bar Area)	Displays the menu for the item selected in the Explorer menu.
Report area (See Report Area)	Consists of the navigation area and application area. In those areas, information for the item selected in the Explorer menu is displayed.



Note: Use the links and buttons in the Tuning Manager server main window to perform GUI operations. Do not use Web browser functions, such as **Refresh**, **Back**, and **Close**, as these functions might display an inappropriate window. If you have been using Web browser functions, close the Web browser window, and then log in to Tuning Manager again.

Global Tasks Bar Area

You can perform the following operations from the global tasks bar area:

- Logging out of Tuning Manager (See [Logging Out](#))
- Launching Performance Reporter or other applications (See [Launching Other Applications](#) or [Launching Performance Reporter](#))
- Launching the online Help
- Displaying version information (such as the product version and license information)
- Displaying the user IDs or full names of currently logged-in users (see **Note**)



Note: If a full name has been specified in the user profile settings, the full name is displayed. If not, the user ID is displayed. For details, see [Viewing and Changing Your User Profile](#).

Explorer Area

The explorer area consists of the **Explorer** menu and the **Dashboard** menu. From the **Explorer** menu, you can access the main functions that a Tuning Manager server provides. From the **Dashboard** menu, you can launch Hitachi Storage Command Suite products.

Explorer Menu

You can access most Tuning Manager server functions from this menu. Table 1-3 describes the functions that are available and information that is displayed in the **Explorer** menu.

Table 1-3 Functions Available and Information Displayed in the Explorer Menu

Explorer menu item	Operable function	Displayed information
Resources	This item is for selecting the target resources for which to display reports. Select this item to view the reports on capacity and performance information for resources that the Tuning Manager server monitors. For details on the functions used to display reports, see Generating Reports .	Clicking this item displays resource categories (Subsystems, Fabrics, Hosts, Applications, and NASs/Other Apps) below it. If you click one of the displayed categories, the resources that the Tuning Manager server currently monitors are displayed in the navigation area in the Resource Tree. Performance information for the resource selected in the Resource Tree is displayed in the application area.
Administration	This item provides the functions necessary for administrators to perform day-to-day operations.	This item is displayed only when you are logged in with Administrator permissions. For details, see the <i>Hitachi Tuning Manager Server Administration Guide</i> .
Settings	Select this item to perform operations such as editing user profiles and displaying license information. For details on editing user profiles, see Viewing and Changing Your User Profile . For details on displaying license information, see the <i>Hitachi Tuning Manager Server Administration Guide</i> .	Clicking this item displays resource categories (User Profile and License Info) below it. Clicking User Profile displays the form for editing a user profile in the report area. Clicking License Info displays the form for editing license information in another window.

Dashboard

You can launch Hitachi Storage Command Suite products from the **Dashboard** menu. Clicking the **GO** link beside an installed Hitachi Storage Command Suite product launches the product. Hitachi Storage Command Suite products that are not installed are displayed in gray and clicking them does nothing.

Application Bar Area

The menu for the item selected in the **Explorer** menu is displayed in the application bar area. Table 1-4 describes the menu items displayed in this area and their functions.

Table 1-4 Items Displayed in the Application Bar Area and Their Functions

Menu item	Function	Condition for display
Performance Reporter (see Note)	Displays a detailed report on the resource for which a report is displayed. For details, see Launching Performance Reporter .	This is displayed only when the Agent that manages the base data for the detailed report can be identified. This item is not displayed, for example, when Subsystems or Hosts is selected in the navigation area.
Correlation Wizard (see Note)	Displays the resource for which a report is displayed and a report on related resources in one window. You can also display two reports, each of which is based on the display conditions specified in the corresponding Report window, in one window. For details, see Displaying a Correlation Report .	-
Historical Report (see Note)	Displays a historical report on the resource for which a report is displayed. For details, see Displaying Historical Reports .	-
Forecast Report (see Note)	Displays a forecasting report on the resource for which a report is displayed. For details, see Displaying a Forecast Report .	-
Print View (see Note)	Displays the displayed report as a print preview image. For details on printing, see Printing Reports .	This is displayed when a resource item other than NASs/Other Apps is selected in the Explorer menu.
Export (see Note)	Exports the displayed report to a CSV file. For details on exporting reports, see Exporting Reports .	This is displayed when a resource item other than NASs/Other Apps is selected in the Explorer menu.
Help	Displays the online Help.	-



Note: This menu item might be hidden depending on the type of selected resource.

Report Area

The report area, which consists of the navigation area and the application area, displays detailed information about the resources that a Tuning Manager server monitors. Figure 1-19 describes the structure of the report area when **Resources** is selected in the explorer area.

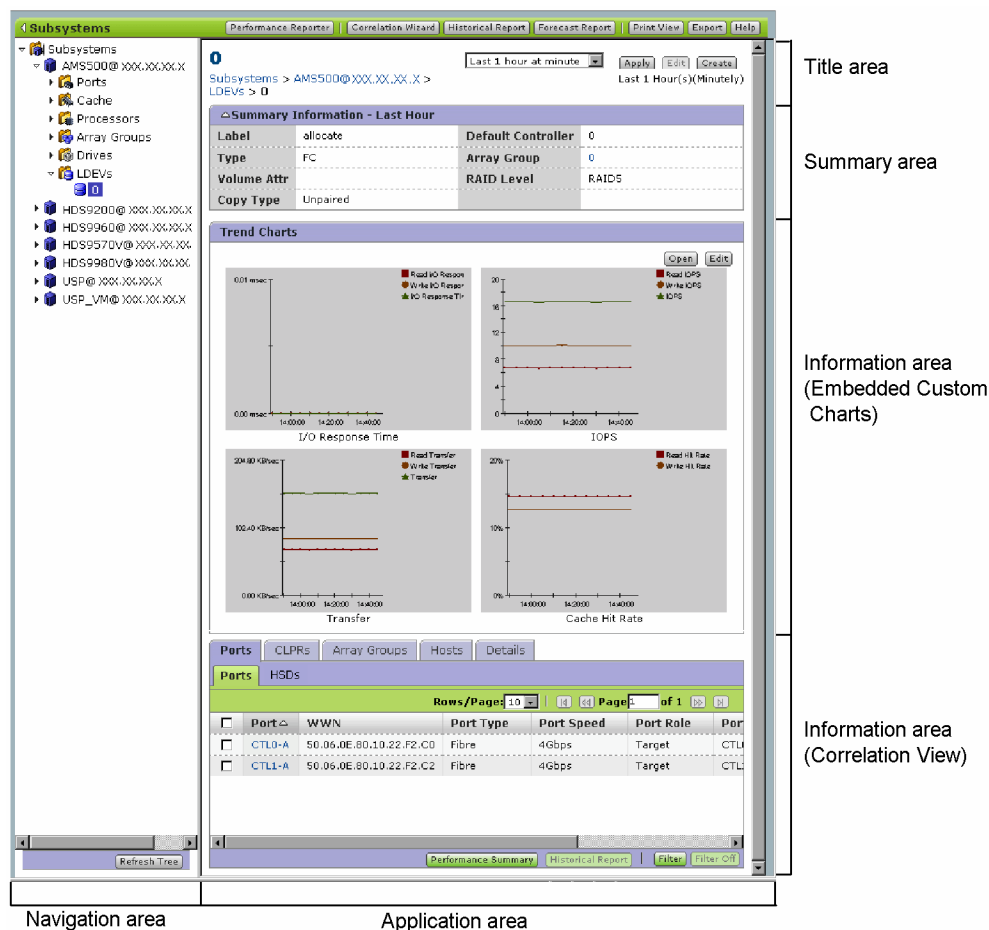


Figure 1-19 The Structure of the Report Area

If too many browsers and applications are running, additional time might be required to display the report area, or some images or text might not be displayed. If such problems occur, close some of the browsers and applications, and then display the report area again.

Navigation Area

Resources for the item selected in the **Explorer** menu are displayed in a tree.

Application Area

Detailed information for the item selected in the navigation area is displayed in the application area. Table 1-5 describes the structure of the application area when **Resources** is selected in the explorer area.

Table 1-5 Structure of the Application Area

Area name	Description
Title area	Information such as the title of the application area, path to the resource (Crumb Trail), and monitoring date are displayed. For details on how to set the monitoring date, see Specifying a Reporting Timeframe .
Summary area	The configuration and capacity information for the resource selected in the navigation area is displayed according to the Report window settings.
Information area	The information area is divided into the following two sections: ▪ Embedded Custom Charts This section displays performance information and capacity information about the resource selected in the navigation area as multiple time-series charts according to conditions specified by the user. The format of the displayed charts can be defined for each user. For details, see Managing Trend Charts Reports. Note that this section displays only the thumbnails of the charts. When you click a thumbnail, the corresponding full-sized chart is displayed in a new window. ▪ Correlation View This section displays detailed information about the resource selected in the navigation area and configuration information and capacity information about related resources. For example, if Subsystem is selected in the navigation area, information about resources such as Ports, Array Groups, and LDEVs is displayed. (The displayed information can be switched by clicking the tabs.) The displayed information can be filtered for each user. Information about a displayed resource can also be displayed as a report in a new window.

Using Correct Values for Data Entry

Table 1-6 describes the valid values for Tuning Manager server tasks when the values are entered by users who do not have administrative privileges. For restrictions on values entered by administrators, see the *Hitachi Tuning Manager Server Administration Guide*.

Table 1-6 Correct Values for Data Entry

Window name	Entry field	Permitted values	Maximum field length	Minimum field length	Notes
Login	User ID	A to Z, a to z, 0 to 9, and the following special characters: # + - . @ _	256	1	The Tuning Manager server checks for a valid user ID entry.
	Password	A to Z, a to z, 0 to 9, and the following special characters: ! # \$ % & ' () * + - . = @ \ ^ _	256	4	The Tuning Manager server checks for a valid password entry.
Edit Profile - <i>user-ID</i>	Password	A to Z, a to z, 0 to 9, and the following special characters: ! # \$ % & ' () * + - . = @ \ ^ _	256	4	If there are no entries in Password and Confirm Password , the password will not be updated.
	Confirm Password	A to Z, a to z, 0 to 9, and the following special characters: ! # \$ % & ' () * + - . = @ \ ^ _	256	4	If there are no entries in Password and Confirm Password , the password will not be updated.
	Full Name	No restrictions	80	0	You cannot specify consecutive dollar signs (\$\$ or \$\$\$, for example)
	Email	No restrictions	255	0	-
	Description	No restrictions	80	0	-



Note: You can change the permitted values and restrictions on the number of characters for the password by setting the security options. For details, see the *Hitachi Tuning Manager Server Administration Guide*.

Using the Online Help

You can activate the online Help from each window of the Main Console. The contents of the Help window depend on how you activated the Help.

- In the global task bar area in the main window, if you choose **Help** and then **Help**:
The top page of the online Help is displayed.
- In the application bar area in the main window, if you click the **Help** button:
The Help window that explains information displayed in the application area and operations that are related to the information is displayed.
- In a window other than the main window, if you click the **Help** button:
The Help window that explains operations for the current window and items in the window is displayed.

If you click the **Help** button in the Performance Reporter window, the top page of the online Help is displayed.

Logging In to a Tuning Manager Server

This chapter provides information about logging in to a Tuning Manager server.

- ☐ [Logging In](#)
- ☐ [Client System Requirements](#)
- ☐ [Viewing and Changing Your User Profile](#)
- ☐ [Launching Other Applications](#)
- ☐ [Launching Performance Reporter](#)
- ☐ [Logging Out](#)

Logging In

To access a Tuning Manager server, you need a user account that has operation permissions for that server. Please see your system administrator to obtain your user ID and password.

1. In the Web browser, enter the URL supplied by the administrator for your site.

The Title window appears, and then the Login window appears automatically.



Note: The URL must be terminated with a slash. (...TuningManager/)

2. Enter your Tuning Manager server user ID.
3. Enter your Password.
4. Click **Login** on the Login window.

When login is successful, the Tuning Manager server main window appears.



Note:

- You cannot log in to the Tuning Manager server GUI through multiple browser windows that you opened on a single client machine. Regardless of whether the Tuning Manager servers you attempt to log in to are on a single server or different servers, Tuning Manager server operations from multiple browser windows on the same client machine are not supported.
 - Please contact your administrator if you encounter any messages related to your site license.
 - If an attempt to log in to a Tuning Manager server fails, make sure that the Tuning Manager server services are running by contacting your administrator. For details on how to start these services, see the *Hitachi Tuning Manager Server Administration Guide*.
 - For details on how to set up your browser, see [Setting Up Your Browser](#).
 - If using Internet Explorer 6.0 as the Web browser in IPv6 environments, you cannot access a Tuning Manager server even if you specify an IPv6 address as the IP address of the Tuning Manager server host. If you want to use Internet Explorer 6.0 for IPv6 connection, specify the IPv6 address and host name of the Tuning Manager server host in the `hosts` file, and then use that host name to access the Tuning Manager server.
-

Client System Requirements

The following table lists the client system requirements for logging in to a Tuning Manager server. Before you attempt to log in, make sure that your client machine meets the requirements.

Table 2-1 Client System Requirements

OS	Browser
Windows 2000 Advanced Server SP3 (x86)	Microsoft Internet Explorer 6.0
Windows 2000 Advanced Server SP4 (x86)	
Windows 2000 Professional SP3 (x86)	
Windows 2000 Professional SP4 (x86)	
Windows 2000 Server SP3 (x86)	
Windows 2000 Server SP4 (x86)	
Windows XP Professional Edition SP2 (x86)	Microsoft Internet Explorer 6.0 or Windows Internet Explorer 7.0
Windows Server 2003 Standard Edition (x86)	Microsoft Internet Explorer 6.0 or Windows Internet Explorer 7.0
Windows Server 2003 Standard Edition SP1 (x86)	
Windows Server 2003 Standard Edition SP2 (x86)	
Windows Server 2003 Enterprise Edition (x86)	
Windows Server 2003 Enterprise Edition SP1 (x86)	
Windows Server 2003 Enterprise Edition SP2 (x86)	
Windows Server 2003 Enterprise Edition (IPF)	
Windows Server 2003 Enterprise Edition SP1 (IPF)	
Windows Server 2003 Enterprise Edition SP2 (IPF)	
Windows Server 2003 R2 Standard Edition (x86)	
Windows Server 2003 R2 Standard Edition SP1 (x86)	
Windows Server 2003 R2 Standard Edition SP2 (x86)	
Windows Server 2003 R2 Enterprise Edition (x86)	
Windows Server 2003 R2 Enterprise Edition SP1 (x86)	
Windows Server 2003 R2 Enterprise Edition SP2 (x86)	

OS	Browser
Windows Server 2003 Standard x64 Edition SP2 (x64)	Windows Internet Explorer 7.0
Windows Server 2003 Enterprise x64 Edition SP2 (x64)	
Windows Server 2003 R2 Standard x64 Edition SP2 (x64)	
Windows Server 2003 R2 Enterprise x64 Edition SP2 (x64)	
Microsoft® Windows Vista® Business	Windows Internet Explorer 7.0
Microsoft® Windows Vista® Enterprise	
Microsoft® Windows Vista® Ultimate	
Solaris 8 (SPARC, 32-bit)	Mozilla 1.4 or Mozilla 1.7
Solaris 8 (SPARC, 64-bit)	
Solaris 9 (SPARC, 32-bit)	
Solaris 9 (SPARC, 64-bit)	
Solaris 10 (SPARC, 32-bit)	
Solaris 10 (SPARC, 64-bit)	

Setting Up Your Browser

Table 2-2 shows the required browser settings. For details on the items and how to specify them, refer to the documentation for the applicable browser.

Table 2-2 Browser Settings

Item	Settings	
	Internet Explorer	Mozilla
Cookies	Enable this item.	
File Download	Enable this item.	Not applicable
Image Display	Enable this item.	
Java Virtual Machine (JVM™)	Enable the JVM. Note: If the JVM is not installed in your version of Windows, you must install the program.	Not applicable
JavaScript™	Enable this item.	
Languages	Specify the language you want to use.	Specify the language you want to use. Note: Specify the same language for the browser and the X-terminal. If these settings are not the same, the character string in the title bar might be displayed incorrectly.
Page Cache	Specify that the latest information be displayed each time the user accesses a page.	

Item	Settings	
	Internet Explorer	Mozilla
Popup Blocker	Disable this item. Note: Also make sure that other utilities that block pop-up windows are not installed.	
Security Policies	Specify Medium as the security level.	Not applicable
Text Size	Specify Medium or Larger as the text size. Note: If you specify Largest , characters might be displayed on top of each other.	Specify Standard or 120% as the text size. Note: If you specify a value larger than 120% , characters might be displayed on top of each other.

Viewing and Changing Your User Profile

If you are logged in, you can view and change your profile.

To view and change the profile:

1. In the explorer area, choose **Settings** and then **User Profile**.

The User Profile window is displayed in the application area. In this window, you can view the profile and permissions.

2. To edit the profile, click the **Edit Profile** button.

The Edit Profile - *user-ID* window is displayed. Edit the profile in this window. You can edit the information in **Full Name**, **E-mail**, and **Description**.

3. Click **OK** to save the information you edited.

The information in the Edit-Profile - *user-ID* window is updated with the edited information.

Launching Other Applications

In the Main Console main window, you can launch the following two types of applications:

- Hitachi Storage Command Suite products
- WWW applications or WWW sites

This section describes how to launch these products.

Launching Hitachi Storage Command Suite Products

You can launch Hitachi Storage Command Suite products from the **Dashboard** menu or global menu.

Launching Storage Command Suite Products from the Dashboard Menu

You can launch Hitachi Storage Command Suite products from the **Dashboard** menu. For details, see [Dashboard](#).

Launching Storage Command Suite Products from the Global Menu

For details, see [Launching WWW Applications and WWW Sites](#).

Launching WWW Applications and WWW Sites

You can launch WWW applications and sites from the global menu by registering their URLs in the Tuning Manager server by using the `hcmdslink` command. For details on this command, see the *Hitachi Tuning Manager Command Line Interface Guide*.

To launch WWW applications and sites:

In the global tasks bar area of the main window, choose a WWW application or site name displayed in the **Go** menu. The chosen WWW application or site will launch in a separate window.

Launching Performance Reporter

This section describes the following:

- How to launch Performance Reporter
- How to view the Performance Reporter main window
- How to specify automatic refresh intervals for the browser

Launching Performance Reporter

If you launch Performance Reporter from the Tuning Manager server main window, the Performance Reporter main window or the Report Tree Selection window is displayed as a separate window. Note that only one of these windows can be open at a time. If you launch Performance Reporter again, the new window is displayed by overwriting the already open window, not by displaying a separate window.

You can launch Performance Reporter from the Tuning Manager server main window in either of the following ways:

- Make sure that a report is displayed in the Tuning Manager server main window, and then click the **Performance Reporter** button in the application bar area. Alternatively, choose **Resources** and then **NASs/Other Apps** in the explorer area, and then click the Agent displayed in the application bar area.

Performance Reporter displays the Report Tree Selection window of the Agent that is linked to the information in the source from which you opened Performance Reporter. If you want to display the Performance Reporter main window when Performance Reporter is launched, edit the `user.properties` file. For details on how to edit this file, see the chapter that describes how to specify settings for the `user.properties` file in the *Hitachi Tuning Manager Server Administration Guide*.

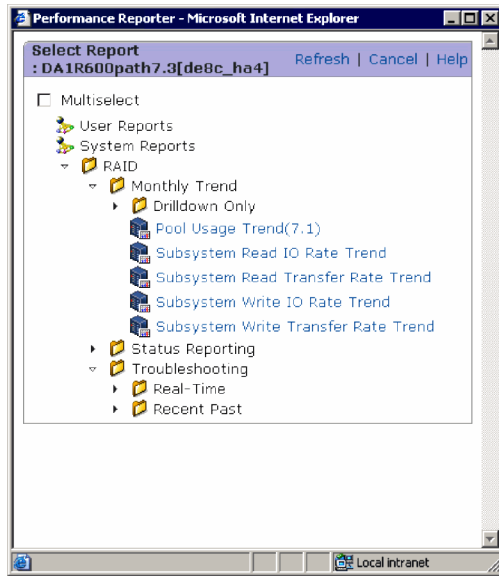


Figure 2-1 Performance Reporter Window Displayed When Launched with an Agent Specified (Report Tree Selection Window)

- In the global tasks bar area of the main window, click **Go** and then **Performance Reporter**.

Performance Reporter displays the main level and enables you to move within an application. If you want to view the information of an Agent (such as Agent for NAS) whose reports cannot be displayed in the Main Console or information that does not correspond to one Agent (such as information about the entire network), launch Performance Reporter from the global menu.

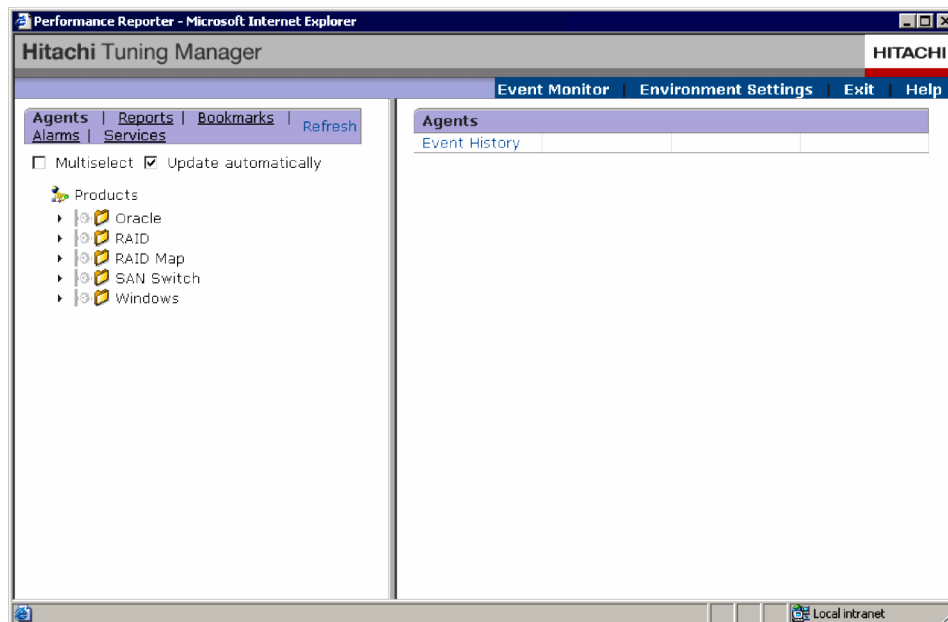


Figure 2-2 Performance Reporter Main Window When Launched Without an Agent Specified (Main Window)



Notes:

- If an error window is displayed when you launch Performance Reporter, make sure that the Performance Reporter service has started. If not, you need to manually start the service. For details, see the section that describes how to start and stop the Tuning Manager server in the *Hitachi Tuning Manager Server Administration Guide*.
- If you disabled automatic refreshing (by clearing the **Update automatically** check box), communication with Performance Reporter will be terminated if you do not perform operations in the window for a certain period of time (4,000 seconds).

Viewing the Performance Reporter Main Window

The Performance Reporter main window consists of the following four frames:

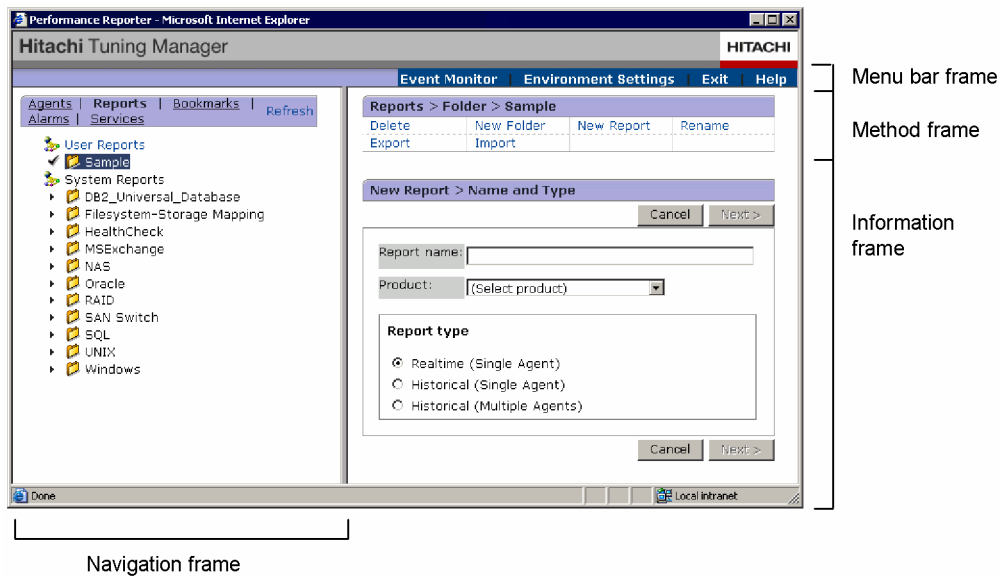


Figure 2-3 Performance Reporter Main Window Components

The following table describes each frame of the main window.

Table 2-3 Frames in the Performance Reporter Main Window

Frame Name	Description
Menu bar frame	This frame displays the menus common to all Performance Reporter windows. The following items are displayed in the Menu bar frame: Event Monitor Choose this item to display the Event Monitor window. For details, see Displaying Events. Environment Settings Choose this item to display the Environment Settings window. For details, see Specifying Automatic Refresh Intervals for the Browser. Exit Choose this item to stop Performance Reporter. Help Choose this item to display the Help window.

Frame Name	Description
Navigation frame	This frame displays the following five items (tabs). If you choose an item, the central part of the Navigation frame changes to the corresponding tree window. Agents Choose this item to display the Agents window. In this window, you can display Agent-related reports and check the alarm status and event history. You can also add new Agents, edit the tree used to monitor Agents, and bind alarm tables to Agents. Reports Choose this item to display the Report window. In this window, you can create, copy, and edit reports. Bookmarks Choose this item to display the Bookmarks window. By registering reports in the bookmark, you can display the reports in fewer steps later on. You can also edit the combination bookmarks to specify how to display combination reports. Alarms Choose this item to display the Alarms window. This item is displayed only for users who have the Admin (application management) permission. In this window, you can create, copy, and edit alarms and alarm tables. Services Choose this item to display the Services window. This item is displayed only for users who have the Admin (application management) permission. In this window, you can manage the Collection Manager and Agent services. You can also check service statuses and display and edit properties. If you click Refresh, the information displayed in the window is updated to the latest information.
Method frame	Items displayed in this frame differ depending on the item you chose in the Navigation frame. Displayed Items correspond to the operations that you can perform in the window displayed by choosing an item in the Navigation frame.
Information Frame	This frame displays the execution results of the operation that you performed in the window displayed by choosing an item in the Method frame.

Specifying Automatic Refresh Intervals for the Browser

By default, Performance Reporter windows are automatically refreshed every 60 seconds. You can specify an automatic refresh interval for each user that logs in.

The specified interval applies to the following windows and statuses:

- Displayed Event Monitor window
- Agent status displayed in the Agents window
- Alarm status displayed in the Agents window
- Health check status displayed in the Agents window

To specify this interval:

1. In the menu-bar frame of the Performance Reporter main window, click **Environment Settings**.

The Environment Settings window appears.

2. Specify a refresh interval, in seconds, by using a value from 10 to 3600. The default is 60 seconds.
3. Click the **OK** button.

Logging Out

You can log out of a Tuning Manager server in either of the following ways:

- In the global tasks bar area of the main window, select **File** and then **Logout**.
- In the global tasks bar area of the main window, click the **Logout** button.

Working with Reports from the Main Console

Some Tuning Manager server reports are displayed by using the Main Console, others are displayed by using Performance Reporter. This chapter describes the reports that you can generate from the Main Console.

On a Tuning Manager server, you can also use the command line interface (CLI) to display reports. For details about commands, see the *Hitachi Tuning Manager Command Line Interface Guide*.

- [Overview](#)
- [Generating Reports](#)
- [Exporting Reports](#)
- [Printing Reports](#)

Overview

The Main Console displays the metrics collected by Agents in formats such as graphs and tables. The definitions necessary for displaying the metrics graphically, as well as the graphs and tables based on those definitions, are called reports.

By displaying and analyzing the appropriate reports according to the monitored targets, you can analyze the performance of hosts and storage subsystems and monitor their capacities.

Features of Reports Displayed with the Main Console

The reports displayed by using the Main Console allow you to:

- Obtain an overview of the system, perform comparative data analysis, and understand trends.
- Display a summary of configuration and capacity data of resources that are stored in the Tuning Manager server database.
- Display a summary of performance data of resources that are stored in the Store databases of Agents.
- Display a summary of the correlated resources of resources displayed as reports in the Main Console.
- Define and retain a range of time for the data to be displayed for each user, simplifying analysis tasks such as comparing data at different points in time.
- Display detailed reports suitable for your purpose from reports displayed in the Main Console. Detailed reports show historical data, future forecasts, and correlations between resources.
- Register detailed reports that show historical data and future forecasts to the original reports and display detailed reports from the original reports in the Main Console as favorites. The favorites functionality allows you to register frequently referenced graphs and display them quickly. Each user can specify the registration and display settings, and the settings can be shared with other users.



Note: Graph formats are fixed.

By analyzing the reports displayed in the Main Console, your organization can:

- Identify storage subsystems on the network.
 - Determine how many hosts exist on your network and its subnetworks.
 - Measure storage capacity network-wide and at progressively lower levels of your network.
 - Quantify filesystems and the total, used, and remaining capacity.
 - Detect and prevent capacity shortages.
 - Rearrange files and filesystems for effective capacity and performance use.
 - Detect performance bottlenecks in storage subsystems or on hosts.
 - Determine when to add a disk to the storage subsystem being used.
 - Understand the relationships between a host's filesystems, logical devices, and the corresponding disks.
 - Understand the RAID configuration of storage devices (which include subsystems, ports, LDEVs, and array groups) associated with a host's filesystems.
 - Ensure that the logical volumes are configured correctly for the applications accessing data stored in the host's filesystems.
-



Note:

- The metrics displayed in the Main Console are a part of the data that Agents collect. To view data that is not displayed in the Main Console, use Performance Reporter. For details about data collected by Agents, see the following manuals:
 - *Hitachi Tuning Manager Hardware Reports Reference*
 - *Hitachi Tuning Manager Operating System Reports Reference*
 - *Hitachi Tuning Manager Application Reports Reference*
 - In certain circumstances, the Tuning Manager server cannot provide metrics for certain resources. This is the result of the limitations of particular operating systems, software, and hardware. For detailed information, see [Restrictions on the Tuning Manager Series](#).
-

Types of Reports Displayed with the Main Console

The Main Console displays the information items listed in the following table as one report. For a Tuning Manager server, this report is called the **main report**. The main report is displayed in the application area of the main window (the Main Report window).

Table 3-1 Items Displayed in the Main Report

Item	Description
Resource summary (configuration data and capacity data)	The configuration data and capacity data of target resources at a specific point in time (see Note 1) are displayed in list format.
Resource summary (performance data and capacity data)	Performance data and capacity data are displayed in a time series (see Note 1) in chart format (see Note 2) according to the settings of the report window. Note that two types of data are displayed in chart format, data defined by the system and data defined by a user, and that you cannot customize the data defined by the system.
Summary of the resources related to the target resource (configuration data and capacity data)	The configuration data and capacity data of the resources related to the target resource at a specific point in time (see Note 1) are displayed in table format.



Notes:

- You can specify time-related settings in the title area of the Main Report window. For details, see [Specifying a Reporting Timeframe](#).
 - You can specify chart display settings in the information area (Embedded Custom Charts) of the main report. For details, see [Managing Trend Charts Reports](#).
-

From the main report, you can also display the following types of reports:

- Reports displayed by using Performance Reporter
Performance Reporter is started to display a detailed report on the capacity data and performance data that are displayed in the Main Report window. For details about report-related operations by using Performance Reporter, see [Working with Reports from Performance Reporter](#) and [Customizing Reports](#).
- Correlation report
The performance data collected from correlated resources of different types during the specified time period is displayed in chart format.
- Historical report
The performance data and capacity data that are collected from the target resource during the specified time period are displayed in chart format.

- **Forecast report**
The performance data and capacity data that are collected from the target resource during the specified time period are used to display expected future values in chart format.
- **Trend charts report**
You can register historical reports and forecast reports in the information area (Embedded Custom Charts) of the Main Report window as favorites. Registered reports are displayed in the Main Report window as thumbnails. These reports are called trend charts reports. If multiple reports are registered and displayed as trend charts reports, you can display one or more reports in full size in one window.
- **Performance summary report (correlated resources)**
The capacity data and performance data of correlated resources at a specific point in time are displayed in table format.
- **Historical report (correlated resources)**
The performance data and capacity data of correlated resources at a specific point in time are displayed in chart format.

Specifying a Reporting Timeframe

On a Tuning Manager server, you can use a report window to specify a time period and the time unit (minutes, hours, or days) of the data that will be displayed in the Main Report window. Report windows are available while you are logged in and are applicable to the reports for the resource selected in the resource tree.

The Tuning Manager server provides the report windows listed in the table below. You can use these report windows when no customization is required.

Table 3-2 Report Windows Provided by the Tuning Manager Server

Report Window Name	Time Interval	Time Period
Last 1 hour at minute	Minutely	Last 1 hour
Last 2 hours at minute	Minutely	Last 2 hours

The report windows provided by the Tuning Manager server cannot be modified or deleted, but new report windows can be added. A user can have a maximum of 20 report windows.

**Notes:**

- In an environment in which the time zone is specified using the GMT + XX:YY format (YY must not be zero), the Tuning Manager server handles the data collected at XX:YY as the data collected at XX:00.
 - If the configuration data and capacity data of target resources were not collected during the time period specified in the report window, the latest data collected before the start time of the specified period is displayed.
 - If the daily capacity data of target resources are shown in the table format report, the following data may be shown as the data of the date specified in the [End Date/Time] of the report window.
 - The data of the day before the date specified in the [End Date/Time] of the report window
 - The data of the day after the date specified in the [End Date/Time] of the report window
-

The following sections describe procedures for creating and applying report windows.

Creating a New Report Window

Follow this procedure to use a customized report window:

1. In the title area of the Main Report window, click the **Create** button. The Create report window window appears.
2. In **Name**, specify the name of the new report window you want to create. Specify no more than 25 characters.
3. Specify the time interval at which data should be displayed as a report.
 - From the **Time Interval** drop-down list:
Select a unit (by the minute, hourly, daily, weekly, monthly, or yearly). By default, **Minutely** is selected.
4. Specify the time period of the data to be displayed as a report.
 - To acquire retrospective data older than the data at the current time (specify the latest time):
Select the **Last** radio button, enter a numeric value from 1 to 125, and then select a unit (by the minute, hourly, daily, weekly, monthly, or yearly) from the drop-down list. By default, the **Last** radio button is selected, **30** is entered for the range, and **Minute(s)** is selected for the unit.
 - To specify a time period that does not end with the current time (specify an absolute time):
Select the **Absolute Time** radio button, and then enter start and end times. You can also use the Calendar window to specify these times. To display this window, click the calendar icon. We recommend that you use this window to specify times.

5. Click the **Save** button. A new report window is defined and saved in the Main Console.

Time period applied when you specify the latest time:

If you specify the latest time, the end time is determined after the current time is compared with one of the following standard times, and then the start time is determined based on the end time:

- When **Time Interval** is set to **Minutely**: the 00 second of every hour
- When **Time Interval** is set to **Hourly**: the 00 minute 00 second of every hour
- When **Time Interval** is set to **Daily**: the 00 hour 00 minute 00 second of every day
- When **Time Interval** is set to **Weekly**: the 00 hour 00 minute 00 second of every Monday
- When **Time Interval** is set to **Monthly**: the 00 hour 00 minute 00 second of the first day of every month
- When **Time Interval** is set to **Yearly**: the 00 hour 00 minute 00 second of January 1 of every year

The following shows an example:

Current time: 12:25:30 on July 3, 2007

Specified time: six hours (when **Hourly** is specified for **Time Interval**)

In this case, the end time is determined to be 12:00:00 on July 3, 2007, based on the standard time, and then the start time is determined to be 7:00:00 on July 3, 2007, which is six hours before the end time.

Note that, if you specify **Weekly** for **Time Interval**, there might be a shift in the start time. In this case, the start time is determined assuming the standard time that follows the current time to be the end time.

The following shows an example:

Current time: July 3, 2007 (Tue.)

Specified time: one year (when **Weekly** is specified for **Time Interval**)

In this case, the end time is determined to be July 9, 2007 (Mon.), and then the start time is determined to be July 10, 2006 (Mon.), which is one year before the end time.

Modifying an Existing Report Window

1. In the title area of the Main Report window, click the **Edit** button. The Edit - *report-window-name* window appears.
2. From the drop-down list, select the name of the report window to modify.
3. Click the **Load** button. The settings of the selected report window are displayed at the bottom of the Report Window Config - Edit window.
4. Modify the settings as required.
5. Click the **Save** button. The report window settings are updated.

Deleting a Report Window

1. In the title area of the Main Report window, click the **Edit** button. The Edit - *report-window-name* window appears.
2. From the drop-down list, select the name of the report window to delete. Note that you cannot delete two of the report windows provided by the Tuning Manager server (**Last 1 hour at minute** and **Last 2 hour at minute**).
3. Click the **Delete** button. The confirmation dialog box appears.
4. Click the **OK** button. The report window is deleted from the Main Console.

Applying a Report Window

1. From the drop-down list in the title area of the Main Report window, select the name of the report window to apply.
2. Click the **Apply** button. The information that appears in the information area is determined by the definition of the selected report window.

Changing the Settings of the Report Windows Setting Window and Moving Resources

To provide accurate datasets for any settings you specify in the Report Window Setting window, the Tuning Manager server keeps historical data intact. This is evident if you move a storage-related host on a given day and then request data of an earlier time period.

Example:

As a part of network reorganization, your network system administrator moves Server 1 from Subnetwork A to Subnetwork C on May 1, 2004. (This occurs outside of the Tuning Manager server.)

On June 10, 2004 you load the Tuning Manager server. April 15, 2004 is the date specified in the Report Window Setting window. In this case, the Tuning Manager server will include Server 1 as one of the servers on Subnetwork A. If you change the date in the Report Window Setting window to May 15, 2004, the Tuning Manager server shows Server 1 as a part of Subnetwork C.

Displaying Data Using the Main Console

This section describes how to read data displayed as a report.

Data Aggregation

In the resource tree, if you display a resource that is at a higher level than other resources, the following data is aggregated:

- Capacity data: The total capacity of the resources that are at a lower level than the resource displayed in the resource tree is displayed.
- Number of resources: The total number of resources that are at a lower level than the resource displayed in the resource tree is displayed.

Values that Are Displayed When No Data Is Acquired

Normally, data acquired from Device Manager and Agents is displayed in the Main Console GUI as metric values. However, if data acquisition fails, metric values are displayed as values such as `n/a` or `error`. Table 3-3 lists the cases where no data can be acquired and the values displayed for the cases.

Table 3-3 Cases Where No Data Can Be Acquired

Case Where No Data Can Be Acquired	Value Displayed
▪ The data model of the Agent is old. ▪ The performance information to be acquired from the Agent is not supported by the Agent.	n/a
Communication with an Agent failed during the acquisition of data from the Agent.	error
▪ Communication with Device Manager failed during the acquisition of configuration and capacity data from Device Manager. ▪ Device Manager did not have any available configuration or capacity data during an attempt to acquire that data. ▪ An Agent did not have any available capacity data during an attempt to acquire that data. ▪ The denominator of a metric value that indicates a ratio changed to 0 during data acquisition from an Agent.	no data



Notes:

- Some limitations might apply depending on the combination of Agents and the version of the used Agent. Also, some limitations on data display might apply when you use a core license version of Device Manager. For details, see [Restrictions on the Tuning Manager Series](#).
- When you display data in chart format, if all the data in the range specified as the display target is displayed as `no data`, the system assumes that no data exists and displays nothing. In this case, the KATN12627-E message is output. If some of the target data items are displayed as `no data`, data items other than those are displayed in chart format.

Generating Reports

From the Main Console, you can perform the following tasks with displayed reports:

- Register the graphs that are often viewed to **Favorite Charts** for ongoing display
- Change the display conditions to display the past history data and the forecast data
- Display the capacity and performance data of a resource and its multiple correlated resources in list format
- Display the capacity and performance data of multiple correlated resources at a specific point in time
- Display the information used to determine whether the cause of a performance bottleneck originated from a server or storage
- Arrange the data in descending order by sorting the values in a table column (see **Note**).



Note: You can only sort the table data displayed in the information area (Correlation View) of the Main Report window or in the Performance Summary - *resource-name* window.

Displaying the Main Report

This section describes how to display the main report from the Main console.



Note: When the Tuning Manager server is polling, displaying the resource information might take a long time. If you are a user who has the Admin (application management) permission, you can use the Administration menu displayed in the explorer area to make sure that polling processing is not being executed. For details, see the descriptions of polling settings and system reports in the *Hitachi Tuning Manager Server Administration Guide*.

To display a report:

1. In the explorer area, from the **Explorer** menu, select **Resources**, and then select the resource for which you want to display reports.

Information about the top-level resource appears in the report area.

2. In the tree in the navigation area, select the level you want to expand. Information about the selected level appears in the application area as the main report.

Table 3-4 lists the information displayed in each area of the application area.

Table 3-4 Area Names in the Application Area and Displayed Information

Area Name	Displayed Information
Title area	This area displays information such as the application area title, hierarchical level (crumb trail), and report window. For details about the report window settings, see Specifying a Reporting Timeframe .
Summary area	This area displays a table that lists capacity data and configuration data at a specific point in time (the end of the time period specified in the report window) for the resource selected from the tree in the navigation area. The displayed data includes the data of any resources related to the selected resource. This information is useful as an overview of resources.
Information area (Embedded Custom Charts)	This area displays trend charts reports that list performance data and capacity data for the resource selected from the tree in the navigation area. In trend charts reports, the following two types of charts are displayed: ▪ Trend charts defined by the system: Data for the past six months is displayed on a monthly basis. ▪ Trend charts defined by a user: Data is displayed based on the time period and time unit specified in the report window. For details about displaying data in this area, see Displaying a Trend Charts Report. Note that this area displays the thumbnails of charts. When a thumbnail is selected, the corresponding full size chart is displayed in a new window
Information area (Correlation View)	This area displays detailed information about the resource selected in the navigation area, as well as the configuration data and capacity data of the resources related to the selected resource. For example, when Subsystems is selected in the navigation area, information about ports, array groups, LDEVs, and other resources will be displayed. Which information to display is selected by clicking the tab of the report. The data of the resource displayed in this area can also be displayed in a new window as a report.



Note: Resources that might exceed 50 in number, such as array groups and LDEVs, are not displayed in the tree of the navigation area even if you perform selection operations in that tree. To display such resources in the tree of the navigation area, select a higher hierarchy such as **Array Groups** or **LDEVs** in the navigation area, and then select the desired resource displayed in the information area (Correlation View).

In the Main Report window, you can perform following operations depending on your purpose:



Note: Depending on the types of resources displayed in the Main Report window, the operations that are displayed will differ.

Table 3-5 Purposes and Corresponding Operations

Purpose	Operation
To display the status of the currently-displayed resource at a different time or during a different time period	Select the report window from the drop-down list in the title area, and then click the Apply button. For details about how add a report window to the drop-down list or change the list, see Specifying a Reporting Timeframe .
To find out about past trends of performance data and capacity data for resources	In the application bar area, click the Historical Report button. For details, see Displaying Historical Reports .
To find out about future trends of performance data and capacity data for a resource	In the application bar area, click the Forecast Report button. For details, see Displaying a Forecast Report .
To compare performance data trends between different time periods, or to compare performance data trends between resources and their correlated resources	In the application bar area, click the Correlation Wizard button. For details, see Displaying a Correlation Report .
To find out about detailed trends of capacity data and performance data for resources	In the application bar area, click the Performance Reporter button. For details, see Launching Performance Reporter .
To display a trend chart of performance data and capacity data	In the information area (Embedded Custom Charts), click the chart it self, or click the Open button. For details, see Displaying a Trend Charts Report .
To filter the displayed information of correlated resources	Display correlated resources that you want to filter, and then click the Filter button. The Main Report - Filter window appears. In the Filter - <i>resource-name</i> window, specify the display conditions, and then click the OK button. Note: If you specify = or <> as the filtering condition and no data is extracted, filter the resources by specifying a range (by using <, >, >=, or <=).
To redisplay filtered correlated resources	Display the correlated resources that have been filtered, and then click the Filter Off button.
To display a summary of performance data	Click the Performance Summary button. For details, see Displaying a Performance Summary Report .
To find out about past trends of the performance data and capacity data of correlated resources	Select the check box of correlated resources whose past trends you want to know, and then click the Historical Report button. For details, see Displaying Historical Reports .



Note: On the Tuning Manager server, an upper limit is set for the amount of data that can be processed for some items of the filtering and sort functions. You can identify such items as follows:

- An item of the filtering function for which an upper limit is set: A hash mark (#) is displayed at the end of the attribute name specified in the Filter - *resource-name* window.
- An item of the sort function for which an upper limit is set: *item-name* (#) is displayed in the tool tip that appears when you place the cursor on the item.

The filtering and sort functions are processed as follows:

Filtering function:

If you use an item for which an upper limit is set when specifying the filter or sort condition and then execute the filtering function, the processing will stop when the number of hits during the processing exceeds 1,000 data items, and then an error message will be displayed on the screen.

To avoid this problem, first specify items for which upper limits are not set as filtering conditions so that the number of execution results will be 1,000 or less. Next, add items for which upper limits are set to the filtering conditions, and then execute the filtering function.

Sort function:

If you use an item for which an upper limit is set as a key for the sort function and then use the following functions, problems might occur:

- Filtering function (For details, see the above description.)
- Export function for outputting a list of data
- Print function for displaying a list of data

When you use these functions, the processing will stop if the number of hits exceeds 1,000 data items, and then an error message will be displayed on the screen.

Sorting Data Tables

You can sort the data tables displayed in the information area (Correlation View) of the Main Report window or in the Performance Summary - *resource-name* window.

- To sort the data by a column other than the default column, click that column's heading.
- To change the sort order, click that column's heading again.
- The order in which each item is sorted differs depending on the type of monitored target.



Note: Data can be sorted on only one column at any time.

Managing Trend Charts Reports

You can register historical and forecast reports as favorites of a main report from which those reports can be displayed. These registered reports are called trend charts. Trend charts can be managed by each user. Users can specify whether to display trend charts from main reports and whether to share the charts with other users.

The specified trend charts are displayed as thumbnails in the information area (Embedded Custom Charts) of the Main Report window. These thumbnail reports are called trend charts reports.

The following sections describe how to specify settings for trend charts reports.



Notes:

- You can register a maximum of 20 trend charts in one main report. Note that the trend charts that are defined by the system and displayed by default do not count towards this maximum.
 - You cannot delete the trend charts reports defined by the system from the information area (Embedded Custom Charts).
-

Adding a Trend Chart

To add a trend chart:

1. Display the Main Report window. For details about how to display this window, see [Displaying the Main Report](#).
2. Display a historical report or forecast report. For details about how to display a historical report or forecast report, see [Displaying Historical Reports](#) or [Displaying a Forecast Report](#).
3. Click the **Save** button. The Add New Chart window appears.
4. In the Add New Chart window, specify the following trend chart settings:
 - **Name**
Specify from one to 100 characters for the name of the trend chart.
 - **Description**
Specify a description (comment) for the trend chart. The description can include a maximum of 100 characters.
 - **Report Window**
Select the time period and time unit for the data to be displayed in the chart by selecting one of the following report window definitions:
 - **Always use** *report-window-name*: Select this to apply the settings of the source Historical Report - *resource-name* window or the source Forecast Report - *resource-name* window.

- **Always use *report-window-name* (Current Window)**: Select this to apply the settings of the report window in the currently displayed Main Report window.
 - **Change when current report window changes**: Select this to apply the settings of the report window in the Main Report window each time the report window changes.
 - **Share with others (Public Permission)**
To share the chart with other users, select this check box. After a chart is shared, a user who does not have the Admin (application management) permission becomes unable to edit or delete the chart even if that user added the chart.
5. Click the **OK** button. Trend charts reports will be displayed as thumbnails in the information area (Embedded Custom Charts) of the Main Report window.



Note: If no reports are registered in a trend charts report, **No object** is displayed.

Editing a Trend Chart

Depending on your login permissions, you can modify the contents of a trend chart.

To edit a trend chart:

1. In the information area (Embedded Custom Charts) of the Main Report window, click the **Edit** button. The Edit - Saved Charts in *resource-name* window appears.
2. Click the edit icon. The Edit - *chart-name* window appears.
3. In the Edit - *chart-name* window, specify the chart settings:
 - **Name**
Specify the name of the trend chart by using from 1 to 100 characters.
 - **Description**
Specify the description (comment) for the trend chart by using no more than 100 characters.
 - **Report Window**
Select the time period and time unit for the data to be displayed in the chart by selecting one of the following report window definitions:
 - **Always use *report-window-name***: Select this to apply the settings of the source historical report - *resource-name* window or the source forecast report - *resource-name* window.
 - **Always use *report-window-name* (Current Window)**: Select this to apply the settings of the report window in the currently displayed Main Report window.

- **Change when current report window changes:** Select this to apply the settings of the report window in the Main Report window each time the report window changes.
 - **Share with others (Public Permission)**
This setting is not displayed if you have specified that the chart be shared with other users. If you want to share a chart with other users, select the check box. After a chart is shared, a user who does not have the Admin (application management) permission becomes unable to edit or delete the chart even if that user added the chart.
 - **Overwrite existing report definition**
Select this check box if you want to overwrite the current chart definitions.
4. Click the **OK** button. The chart will be displayed as a thumbnail in the information area (Embedded Custom Charts) of the Main Report window.

Setting Up Trend Charts to Be Shared with Other Users

Even if you have specified not to share trend charts with others, you can easily change your settings to share them.



Note: After a chart is shared, a user who does not have the Admin (application management) permission becomes unable to edit or delete the chart even if that user added the chart.

To change the setting:

1. Display the Main Report window. For details about how to display this window, see [Displaying the Main Report](#).
2. In the information area (Embedded Custom Charts) of the Main Report window, click the **Edit** button. The Edit - Saved Charts in *resource-name* window appears.
3. If you want to share a chart with other users, click the share icon of that chart.
4. When the confirmation dialog box appears, click the **OK** button.

Specifying Display Settings for Trend Charts (Embedded Custom Charts)

Each user can specify which trend charts to display in the information area (Embedded Custom Charts). To specify the settings:

1. Display the Main Report window. For details about how to display this window, see [Displaying the Main Report](#).
2. In the information area (Embedded Custom Charts) of the Main Report window, click the **Edit** button. The Edit - Saved Charts in *resource-name* window appears.
3. To add a trend chart to be displayed in the information area (Embedded Custom Charts), select the check box of that chart, and then click the **Show** button.
4. To decrease the number of trend charts displayed in the information area (Embedded Custom Charts), select the check boxes of the charts that you do not want to display, and then click the **Hide** button.

Deleting Trend Charts

Trend charts can be deleted in the following ways:

- A user deletes trend charts by using the GUI.
- A resource is removed from the management targets of the Tuning Manager server. In this case, all trend charts linked to that resource are deleted.
- A user account is deleted from the Tuning Manager server. In this case, only the trend charts created by that user that are not set up to be shared with other users are deleted.

The following steps describe how to delete a trend chart by using the GUI. Note that you can complete this task only if the target trend chart is not shared with other users.

To delete a trend chart:

1. Display the Main Report window. For details about how to display this window, see [Displaying the Main Report](#).
2. In the information area (Embedded Custom Charts) of the Main Report window, click the **Edit** button. The Edit - Saved Charts in *resource-name* window appears.
3. Click the delete icon of the trend chart that you want to delete.
4. When the confirmation dialog box appears, click the **OK** button.

Displaying a Trend Charts Report

From the Main Report window, you can display trend charts reports.



Note: In the Main Report window, registered trend charts reports are displayed as thumbnails. To register charts or display them as thumbnails, see [Managing Trend Charts Reports](#). This section describes how to display trend charts reports.

To display a trend charts report:

1. Display the Main Report window. For details about how to display this window, see [Displaying the Main Report](#).
2. To display only one of the charts whose thumbnails are displayed in the information area (Embedded Custom Charts), click that chart's thumbnail. The full size chart is displayed in the Trend Charts window.
3. To display all the charts whose thumbnails are displayed in the information area (Embedded Custom Charts), click the **Open** button. The full size charts are displayed in the Trend Charts window.

Displaying Historical Reports

Historical reports allow you to retrospectively analyze changes in performance and capacity data. You can display historical reports by using any of the following four methods:

- Displaying historical reports for the resource displayed in the Main Report window:
In the application bar area, click the **Historical Report** button. In this case, the Historical Report - *resource-name* window is displayed in single resource mode. (One resource is displayed, and multiple metrics have the same attribute.)
- Displaying historical reports for correlated resources displayed in the Main Report window:
In the information area (Correlation View), select the check boxes for desired correlated resources, and then click the **Historical Report** button. If you select multiple check boxes, the Historical Report - *resource-name* window is displayed in multi-resource mode. (Multiple resources are displayed, and the number of metrics is one.)
- Displaying a historical report registered in trend charts reports of the Main Report window:
In the information area (Embedded Custom Charts), click the desired historical report. Whether the Historical Report - *resource-name* window is displayed in single resource mode or multi-resource mode depends on the definition specified by the user during registration.

- Displaying historical reports for correlated resources displayed in the Performance Summary - *resource-name* window:

In the Performance Summary - *resource-name* window, select the check boxes for desired correlated resources, and then click the **Historical Report** button. If you select multiple check boxes, the Historical Report - *resource-name* window is displayed in multi-resource mode.

This section describes how to display historical reports by using the Historical Report - *resource-name* window separately for single resource and multi-resource mode.

Displaying Historical Reports (in Single Resource Mode)

To display historical reports in single resource mode:

1. Display the Historical Report - *resource-name* window. For details about how to display this window, see [Displaying Historical Reports](#).
2. Specify the historical report display conditions in the Historical Report - *resource-name* window.
 - From the **Select a report window** drop-down list:
Select the report window in which the conditions applicable to the user's needs are defined. If you display the Historical Report - *resource-name* window from the main report or performance summary report, the report window settings that have been applied to the report from which the window is displayed are assumed to be the defaults. If you display the Historical Report - *resource-name* window from trend charts reports, the report window applied to this window depends on the definition specified by the user during registration.
 - From the **Select an attribute group** drop-down list:
Select the attribute group applicable to the user's needs. Note that the number (enclosed in parentheses) added to the end of an attribute group indicates the number of attributes that belong to that group.
3. Click the **Apply** button. A historical report that is based on the display conditions specified in step 1 is displayed at the bottom of the Historical Report - *resource-name* window.
4. If you want to save this report as a trend charts report, click the **Save** button. The Add New Chart window appears. For further details, see [Managing Trend Charts Reports](#).

Displaying Historical Reports (in Multi-Resource Mode)

To display historical reports in multi-resource mode:

1. Display the Historical Report - *resource-name* window. For details about how to display this window, see [Displaying Historical Reports](#).
2. Specify the historical report display conditions in the Historical Report - *resource-name* window.
 - From the **Select a report window** drop-down list:
Select the report window in which the conditions applicable to the user's needs are defined. If you display the Historical Report - *resource-name* window from the main report or performance summary report, the report window settings that have been applied to the report from which the window is displayed are assumed to be the defaults. If you display the Historical Report - *resource-name* window from trend charts reports, the report window applied to this window depends on the definition specified by the user during registration.
 - From the **Select an attribute group** drop-down list:
Select the attribute group applicable to the user's needs.
Note that the number (enclosed in parentheses) added to the end of an attribute group indicates the number of attributes that belong to that group.
 - From the **Select an attribute** drop-down list:
Select the attribute applicable to the user's needs.
3. Click the **Apply** button. A historical report that is based on the display conditions specified in step 1 is displayed at the bottom of the Historical Report - *resource-name* window.
4. If you want to save this report as a trend charts report, click the **Save** button. The Add New Chart window appears. For further details, see [Managing Trend Charts Reports](#).



Note: Your network might be reorganized and updated after you have saved historical reports as trend charts reports. You cannot include resources that are newly added to the network in historical reports registered in multi-resource mode. You need to register a new historical report that includes the desired resource.

Displaying a Forecast Report

Forecast reports allow you to forecast future changes in performance and capacity data based on the accumulated past data. You can display a forecast report by using either of the following two methods:

- Displaying a forecast report for the resource displayed in the Main Report window:

In the application bar area, click the **Forecast Report** button. The Forecast Report - *resource-name* window is displayed.

- Displaying a forecast report registered in trend charts reports of the Main Report window:

In the information area (Embedded Custom Charts), click the desired forecast report. The Forecast Report- *resource-name* window is displayed.

This section describes how to display a forecast report by using the Forecast Report *resource-name* window.

To display a forecast report:

1. Display the Forecast Report - *resource-name* window.
2. Specify the forecast report display conditions in this window.

- From the **Select a report window** drop-down list:

Select the report window in which the conditions applicable to the user's needs (the time period and time unit for the past data that will be the basis for future forecasts) are defined.

If you display the Forecast Report - *resource-name* window from the main report, the report window settings that have been applied to the report from which the window is displayed are assumed to be the defaults. If you display the Forecast Report - *resource-name* window from trend charts reports, the report window applied to this window depends on the definition specified by the user during registration.

- From the **Select an attribute group** drop-down list:

Select the attribute group applicable to the user's needs.

Note that the number (enclosed in parentheses) added to the end of an attribute group indicates the number of attributes that belong to that group.

- From the **Select an attribute** drop-down list:

Select the attribute applicable to the user's needs.

- In **Num of forecasted recorder**:

Specify the number of measurement values to be displayed as forecast data in the range from 1 to 99. (The default is 2.)



Note: Good forecasts depend on a reasonable historical sample. In the Tuning Manager server, make sure that in Tuning Manager server, the historical data to be used as reference data includes at least three measurement values. For example, if you use historical data whose time interval is set to **Hourly**, use a report window in which the data collection time period is set to three hours or more. Also, for more accurate results, use a report window configured such that it includes many measurement values. We recommend that you maintain a ratio of the number of historical data measurement values to the number of forecast data measurement values of at least 4:1. (For example, if you want to include two measurement values in forecast data, include at least eight measurement values in the historical data.)

- From the **Confidence Level** drop-down list:

Select the forecast accuracy. You can select **0.9**, **0.95**, **0.99**, **0.999**, **0.9999**, or **0.99999**. The default is **0.95**.

If you increase the forecast accuracy, the width of the margin (the upper and lower limits) for the forecast values also increases. If you want to acquire more accurate forecast values, select a higher value.

3. Click the **Apply** button. A forecast report that is based on the display conditions specified in step 3 is displayed at the bottom of the Forecast Report - *resource-name* window.
4. If you want to save this report as a trend charts report, click the **Save** button. The Add New Chart window appears. For further details, see [Managing Trend Charts Reports](#).

Displaying a Correlation Report

You can display correlation reports by using the Correlation Wizard of the Main Console. The features of the Correlation Wizard are as follows:

- The Correlation Wizard can display trend charts of the performance data of resources and their correlated resources in the same window.

This is useful when you want to analyze performance data based on correlations between resources.

- The Correlation Wizard can also display trend charts of the performance data of resources and their correlated resources for different time periods in the same window.

This is useful when you want to compare performance data acquired during normal operation to performance data acquired when a problem occurred.



Note: You can display a maximum of 20 trend charts in correlation reports. Do not exceed 20, based on the following calculation, when specifying settings:
 $\{1 \text{ (the number of trend charts of the resource)} + \text{number-of-trend-charts-of-correlated-resources}\} * 2$ (if the **Secondary report window** is specified)

To display a correlation report:

1. Display the Main Report window. For details about how to display this window, see [Displaying the Main Report](#).
2. In the Main Report window, click the **Correlation Wizard** button. The Correlation Wizard - *resource-name* window (report definition) appears.
3. If you want to compare the performance data of resources and their correlated resources, select the check box of the correlated resource for which you want to make a comparison, and then, from the drop-down list, select the metric that you want to display.
4. From the **Primary report window** drop-down list, select the report window for which the time period and time unit of the data whose trend you want to display has been specified.
5. If you want to compare the trends for the time period of the displayed report window to those of another time period, from the **Secondary report window** drop-down list, select a report window that is specified for the other time period.
6. Click the **Next >** button. The Correlation Wizard - *resource-name* window (report display) appears.

Displaying a Performance Summary Report

Performance summary reports can display the performance data of correlated resources at a specific point in time. The time initially used for display is the end of the time period (hour) specified in the report window of the Main Report window. You can change this value in performance summary reports.

To display a performance summary report:

1. Display the Main Report window. For details about how to display this window, see [Displaying the Main Report](#).
2. In the information area (Correlation View), choose the tab of the correlated resource for which you want to display performance data.
3. Click the **Performance Summary** button. The Performance Summary - *resource-name* window appears.

4. If you want to change the date and time conditions used for data in the Performance Summary - *resource-name* window, click the time indicator in the window. The Edit - Report Window window appears. In this window, specify the date and time conditions you want to use for data in the Performance Summary - *resource-name* window.
 - From the **Time Interval** drop-down list:

Select the time unit you want to use in the Performance Summary - *resource-name* window. You can select hourly, daily, weekly, monthly, or yearly. The default is the unit that is used in the report window that displays the Performance Summary - *resource-name* window.
 - **Report Window:**

The information displayed in this item varies according to the **Time Interval** specification.

If you want to use the latest data for the report, select the **Last Hour**, **Last Week**, **Last Month**, or **Last Year** radio button.

If you want to specify an absolute time, select the **Absolute time** radio button, and then specify the time. You can also use the Calendar window to specify an absolute time. We recommend that you use this window. To display this window, click the calendar icon.
5. If you want to filter items displayed in performance summary reports more, click the **Filter** button. The Filter - Performance Summary - *resource-name* window appears. Specify the settings in the window, and then click the **OK** button.



Note: If you specify = or <> as the filtering condition and no data is extracted, filter the resources by specifying a range (by using <, >, >=, or <=).

6. To disable the filtering function of performance summary reports, click the **Filter Off** button.
7. If you want to display trends of past performance data (not performance data for a specific point in time), select the check box of data that you want to display, and then click the **Historical Report** button. The Historical Report - *resource-name* window appears. For details, see [Displaying Historical Reports](#).



Note: On the Tuning Manager server, an upper limit is set for the amount of data that can be processed for some items of the filtering and sort functions. For details, see **Note** in [Displaying the Main Report](#).

Exporting Reports

From the Tuning Manager server, you can export reports to a CSV-formatted file by using the GUI or CLI. This file format is suitable for use in spreadsheet applications such as Microsoft Excel and desktop database programs. CSV data that is obtained by using the export function is output by using the UTF-8 character set.



Notes:

- If you filter or sort an item for which an upper limit is set for the amount of data that can be processed, certain notes for the filtering and sort functions are relevant when using the export function as well. For details, see **Note** in [Displaying the Main Report](#).
 - Even if the conditions described in the notes for the filtering and sort functions do not apply, only 1,000 results can be displayed.
 - If the [Close] button is not displayed on the export screen even when the export procedure finished, close the window by using the [Close] function of the browser.
-

Rules and an Example of CSV Output

- Each element in a row is enclosed in double quotation marks (").
- Except for the last element, each element in a row is followed by a comma (,).
- Each row is terminated by a new line character. The line feed code is `CR+LF` in Windows, and `LF` in Solaris.
- A double quotation mark (") used as a character in an element is represented by two double quotation marks (").
- No unit symbols other than the percent sign (%) are included in values.
- Units are indicated in the column headers of the report.

How a performance summary report is exported in CSV format is explained below. The following performance summary report is used as an example.

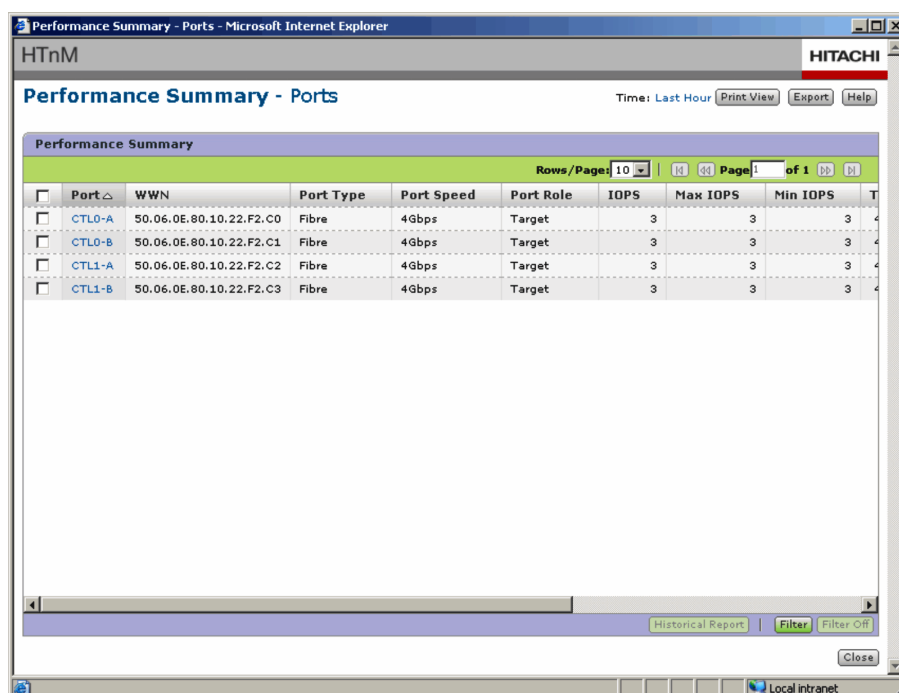


Figure 3-1 Example of a Performance Summary Report

Exporting the report creates a CSV file similar to the following:

```
"Performance Summary - Ports","Last Hour"
"Performance Summary"
"Port","WWN","Port Type","Port Speed","Port Role","IOPS","Max IOPS","Min
IOPS","Transfer (MB/sec)","Max Transfer (MB/sec)","Min Transfer (MB/sec)","Port Controller"
"CTL0-A","50.06.0E.80.10.22.F2.C0","Fibre","4Gbps","Target","3","3","3","4.17","4.24","4.10
","CTL0"
"CTL0-B","50.06.0E.80.10.22.F2.C1","Fibre","4Gbps","Target","3","3","3","4.17","4.24","4.10
","CTL0"
"CTL1-A","50.06.0E.80.10.22.F2.C2","Fibre","4Gbps","Target","3","3","3","4.17","4.24","4.10
","CTL1"
"CTL1-B","50.06.0E.80.10.22.F2.C3","Fibre","4Gbps","Target","3","3","3","4.17","4.24","4.10
","CTL1"
:
```

CSV files are easily imported into popular spreadsheet programs.

	A	B	C	D	E	F	G	H	I	
1	Performance Summary - Ports	Last Hour								
2	Performance Summary									
3	Port	WWN	Port Type	Port Speed	Port Role	IOPS	Max IOPS	Min IOPS	Transfer (MB/sec)	Max Transfer (MB/sec)
4	CTL0-A	50.06.0E.80.10.22.F2.C0	Fibre	4Gbps	Target	3	3	3	4.17	4.24
5	CTL0-B	50.06.0E.80.10.22.F2.C1	Fibre	4Gbps	Target	3	3	3	4.17	4.24
6	CTL1-A	50.06.0E.80.10.22.F2.C2	Fibre	4Gbps	Target	3	3	3	4.17	4.10
7	CTL1-B	50.06.0E.80.10.22.F2.C3	Fibre	4Gbps	Target	3	3	3	4.17	4.10

Figure 3-2 CSV File Imported into Microsoft Excel

The following sections describe how to export reports by using the GUI. For details about exporting reports using the CLI, see the *Hitachi Tuning Manager Command Line Interface Guide*.

Exporting the Main Report

To export the main report:

1. Display the Main Report window. For details, see [Displaying the Main Report](#).
2. In the application bar area, click the **Export** button. The dialog box for saving a file appears.
3. Save the CSV file in an appropriate location.

When exported to a CSV file, the data in the report has the following structure:

```
Main-Report-title
crumb-trail, Report-Windows-name
Resource-Summary-header, data-time (see Note)
attribute-name, attribute-name, ..., attribute-name
attribute-value, attribute-value, ..., attribute-value
tab-selected-in-the-information-area- (Correlation-View)
attribute-name, attribute-name, ..., attribute-name
attribute-value, attribute-value, ..., attribute-value
```



Note: This is the end time specified for the report window.

The information displayed in the information area (Embedded Custom Charts) of the main report is not output to the CSV file. You must output this information from the Trend Charts window.

Exporting a Trend Charts Report

To export a trend charts report:

1. Display the Trend Charts window. For details, see [Displaying a Trend Charts Report](#).
2. Click the **Export** button. The dialog box for saving a file appears.
3. Save the CSV file in an appropriate location.

When exported to a CSV file, the data in the report has the following structure:

```
Trend Charts
chart-name
chart-export-result
chart-name
chart-export-result
...
```

The chart export results vary according to the resource mode as shown below.

Single resource mode:

```
resource-display-name
Date/Time, Time Interval, attribute-name, ..., attribute-name
data-time, Time-Interval-of-the-export-source, attribute-value, ..., attribute-value
data-time, Time-Interval-of-the-export-source, attribute-value, ..., attribute-value
...
```

Multi-resource mode:

```
Date/Time,Time
Interval,resource-display-name-header,...,resource-display-name-header,attribute-name
data-time,Time-Interval-of-the-export-source,resource-display-name,attribute-value
data-time,Time-Interval-of-the-export-source,resource-display-name,attribute-value
...
```

Single resource mode with forecast values:

```
resource-display-name
Date/Time,Time Interval,attribute-name,...,attribute-name
data-time,Time-Interval-of-the-export-source,attribute-value,...,attribute-value
data-time,Time-Interval-of-the-export-source,attribute-value,...,attribute-value
...
Date/Time,Time Interval,Forecast,Upper Error Margin,Lower Error Margin
data-time,Time-Interval-of-the-export-source,attribute-value,...,attribute-value
data-time,Time-Interval-of-the-export-source,attribute-value,...,attribute-value
...
```

Exporting a Performance Summary Report

To export a performance summary report:

1. Display the Performance Summary - *resource-name* window. For details, see [Displaying a Performance Summary Report](#).
2. Click the **Export** button. The dialog box for saving a file appears.
3. Save the CSV file in an appropriate location.

When exported to a CSV file, the performance summary report information has the following structure:

```
Performance-Summary-header,Report Time
table-name
attribute-display-name,attribute-display-name,...,attribute-display-name
attribute-value,attribute-value,...,attribute-value
...
```

Exporting a Correlation Report

To export a correlation report:

1. Display the correlation report. For details, see [Displaying a Correlation Report](#).
2. Click the **Export** button. The dialog box for saving a file appears.
3. Save the CSV file in an appropriate location.

When exported to a CSV file, the correlation report information has the following structure:

```
Correlation-Report-title
chart-export-result
```

The chart export result varies according to the resource mode. For details, see [Exporting a Trend Charts Report](#).

Exporting a Historical Report or Forecast Report

To export a historical or forecast report:

1. Display the historical report or forecast report. For details, see [Displaying Historical Reports](#) or [Displaying a Forecast Report](#).
2. Click the **Export** button. The dialog box for saving a file appears.
3. Save the CSV file in an appropriate location.

When exported to a CSV file, the historical or forecast report information has the following structure:

<i>title-of-the-Historical-Report-or-Forecast-Report</i> <i>chart-export-result</i>
--

The chart export result varies according to the resource mode. For details, see [Exporting a Trend Charts Report](#).

Printing Reports

The Main Console allows you to see print previews of the following reports and to print them:

- Main report
- Performance summary report

A print preview of the main report or a performance summary report provides the following benefits:

- Buttons, check boxes, and other items that do not need to be printed can be hidden.
- All the items that will be printed can be checked before printing.

Normally, the Main Report and Performance Summary - *resource-name* windows do not display all items that will be displayed in the report.



Note:

- If you filter or sort an item for which an upper limit is set for the amount of data that can be processed, certain notes for the filtering and sort functions are relevant when using the print function as well. For details, see **Note** in [Displaying the Main Report](#).
 - Even if the conditions described in the notes for the filtering and sort functions do not apply, only 1,000 results can be displayed.
-

Printing the Main Report

To see a print preview of the main report and then print it:

1. Display the Main Report window. For details, see [Displaying the Main Report](#).
2. In the information area (Correlation View), choose the tab of the correlated resource that you want to preview.
3. Click the **Print View** button. The Print View - Main Report window appears.
4. To print the main report, click the **Print** button.

Printing the Performance Summary Report

To see a print preview of the performance summary report and then print it:

1. Display the Performance Summary - *resource-name* window. For details, see [Displaying a Performance Summary Report](#).
2. Click the **Print View** button. The Print View - Performance Summary - *resource-name* window appears.
3. To print the performance summary report, click the **Print** button.

Working with Reports from Performance Reporter

Some Tuning Manager server reports are displayed by using the Main Console, and some are displayed by using Performance Reporter. This chapter describes the reports that are displayed by using Performance Reporter.

On a Tuning Manager server, you can also use the command line interface (CLI) to display reports. For details about commands, see the *Hitachi Tuning Manager Command Line Interface Guide*.

Note that the procedures described in this chapter assume that the Performance Reporter main window is displayed. For details about how to start Performance Reporter, see [Launching Performance Reporter](#).

- ☐ [Overview](#)
- ☐ [Generating Reports](#)
- ☐ [Displaying Combination Reports](#)
- ☐ [Exporting Reports](#)
- ☐ [Bookmarking Reports](#)
- ☐ [Printing Reports](#)
- ☐ [Stopping Performance Reporter](#)

Overview

Performance Reporter displays the performance data collected by Agents in formats such as graphs and tables. The definitions necessary for displaying this data graphically and the graphs and tables based on these definitions are called **reports**.

Features of Reports Displayed with Performance Reporter

The reports displayed by using Performance Reporter allow you to perform the following operations:

- Analyze trends and performance in detail
- Display detailed data by the minute
- Specify display formats of graphs and change time ranges
- For historical reports, display data stored in Store databases of Agents
- Display all data collected by Agents
- Display data from single instance records or multi-instance records
- Output CSV or HTML files
- Display different historical reports in one report

Types of Reports Displayed with Performance Reporter

Performance Reporter can display both historical reports and real-time reports. A historical report displays data from a specified interval of time. A real-time report displays temporarily collected, current data.

Any of the following three report types can be selected, as appropriate to the analysis objectives for the performance data:

- Historical report (single Agent): This type of report displays one report window for each Agent. When multiple Agents are selected, the report displays as many windows as the number of Agents you have selected. A single-Agent historical report handles the following record types:
 - Single instance
A record that is recorded in one row each time data is collected is called a single instance record. In Performance Reporter, each row in a record is called an instance.
 - Multi-instance
A record that is recorded in more than one row each time data is collected is called a multi-instance record. Such a record can be useful when comparing values for the same field between different Agents.

- Historical report (multiple Agents): This type of report displays all selected Agents in one window, regardless of whether one report or multiple reports are selected.
- Real-time report (single Agent): Displays current data for one Agent that has been temporarily collected. The collected values can be displayed in order and ranked. Note that past data cannot be displayed because it is not stored in the Store database. Real-time reports (single Agent) support data from single instance or multi-instance records.

Performance Reporter provides both normal and combination reports. A **combination report** combines multiple historical reports in the same graph. By registering reports that combine report definitions from multiple Agents in a bookmark or combination bookmark, you can display reports and combination reports right away without selecting each Agent individually.

The information in a combination bookmark is not limited to registered reports. You can also save reports of a specified period of time in the past as the base values. These reports are used to analyze the registered reports and are called **baselines**. By defining and managing multiple registered reports and baselines in a combination bookmark, you can display them on the same graph as a combination report. Such combination reports allow you to ascertain the operating status of the system as a whole.

The following figure shows the relationship between the definition of a combination bookmark and a combination report.



Each agent-specific report registered in a combination bookmark is called a *registered report*.

Figure 4-1 Relationship Between a Combination Bookmark and Combination Report

As shown in the figure, by creating a combination bookmark that contains report definitions for more than one Agent, you can display multiple reports in one graph. For example, you could visually check the correlation between the number of transactions handled by the HTTP service and its response time by superimposing the two values in a combination report.

For details about displaying normal reports, see [Generating Reports](#). For details about displaying combination reports, see [Displaying Combination Reports](#).

Generating Reports

This section describes how to display reports by using Performance Reporter and the formats of displayed reports.

For details about starting Performance Reporter, see [Launching Performance Reporter](#).

Displaying Reports with Performance Reporter

1. In the Navigation frame, choose the **Agents** link. The Agent tree is displayed.
2. In the Navigation frame, select the desired Agent from the Agent tree.
3. In the Method frame, choose **Display Report**.
4. From the report tree, choose the name of the report you wish to display (see Figure 4-2).

If you start Performance Reporter by selecting an Agent in the main window of the Tuning Manager server, you can select a report in the report tree selection window displayed for the Agent. Therefore, you can skip steps 1 to 3.

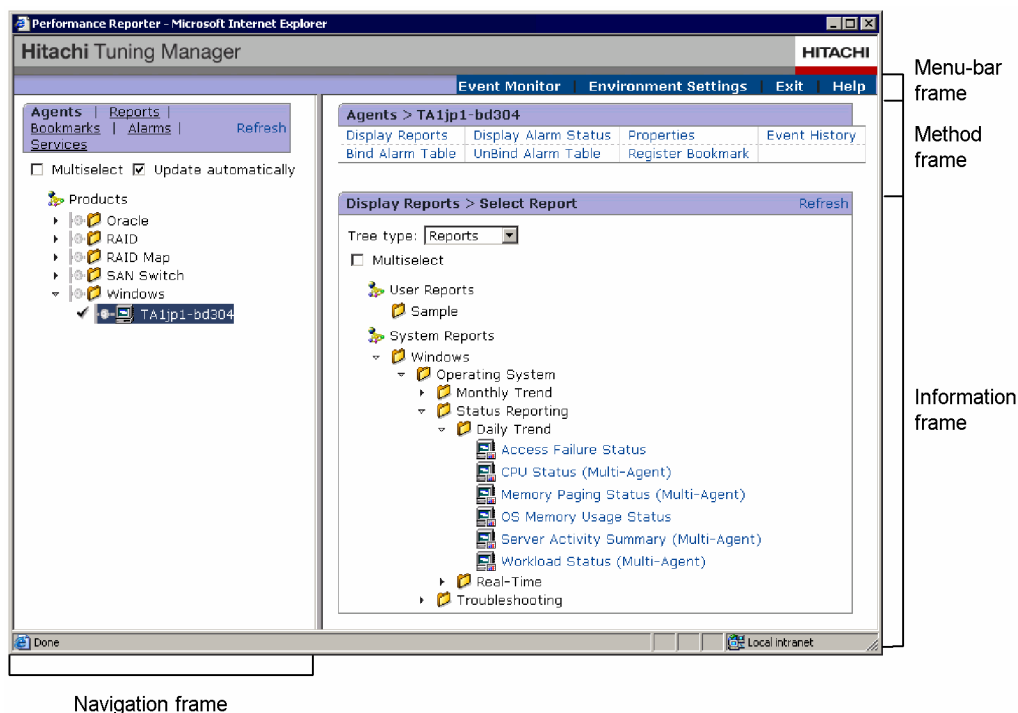


Figure 4-2 Performance Reporter Main Window After Specifying a Report



Note: If the data model version specified in the report is newer than the data model version of the Agent, you cannot use the report.

You can check data model versions by performing the following procedures.

To check the data model version specified in a report:

In a report window, click the **Properties** link. The Agent type and data model version will be displayed in **Product** in the **Name and type** area.

To check the data model version of an Agent:

1. In the **Agents** tree in the navigation frame, click the Agent whose report you want to display.
2. In the method frame, click **Display properties**. The Service Properties window appears.
3. In this window, click the Agent. The data model version will be displayed at the bottom of the information frame.

For some solution set reports, data model versions enclosed in parentheses might be added to the ends of report names. Solution set reports whose names do not include data model versions can be used regardless of their data model version because they do not depend on Agent data model versions.

Displaying Historical Reports

A historical report displays performance data that is stored in an Agent's Store database. To display a historical report, you must have specified `Log = Yes` in the Services window of Performance Reporter or by executing the `jpcasrec update` command so that the performance data to be displayed in the report will be stored in the Store database. Because `Log = No` is set by default for historical reports stored in the Advanced folder for a solution set, you must change the setting to display these reports.

For details about how to operate and manage a Store database and how to specify settings in the GUI, see the *Hitachi Tuning Manager Agent Administration Guide*. For details about the `jpcasrec update` command, see the *Hitachi Tuning Manager Command Line Interface Guide*.

Displaying Real-time Reports

A real-time report uses performance data collected by an Agent each time the report is displayed. This performance data is not stored in the Store database. Therefore, you do not need to specify settings for storing performance data in the Store database.

Changing Display Conditions for a Report

When a report is displayed, you can change the data collection period and filter conditions that were set during report definition. Use the **Show Options** tab in the report window to change report display conditions.

To change report display conditions:

1. In the report window, click **Show Options**. The Show Options window appears.
2. Change conditions as desired, and then click the **OK** button. The new conditions take effect, and then the report window is redisplayed.

The display conditions displayed in the Show Options window differ depending on whether the report is a historical report or real-time report.

About Report Display Formats

Performance Reporter can display reports in various formats:

- Column graph (see [Column Graphs](#))
- Stacked column graph (see [Stacked Column Graphs](#))
- Bar graph (see [Bar Graphs](#))
- Stacked bar graph (see [Stacked Bar Graphs](#))
- Pie graph (see [Pie Graphs](#))
- Line graph (see [Line Graphs](#))
- Area graph (see [Area Graphs](#))
- Stacked area graph (see [Stacked Area Graphs](#))
- List (see [Lists](#))
- Table (see [Tables](#))

Column Graphs

A column graph is appropriate for checking the status of each instance or Agent at specific points in time. The initial display shows the data collected most recently.

The X-axis represents the instance, and the Y-axis represents the usage status of the target resource. When multiple fields are set, each instance is shown separately on the X-axis. For a single-instance report, each bar indicates a field set for display. For a multiple-instance report, a group of bars indicates an instance, and each bar shows the field(s) set for display.

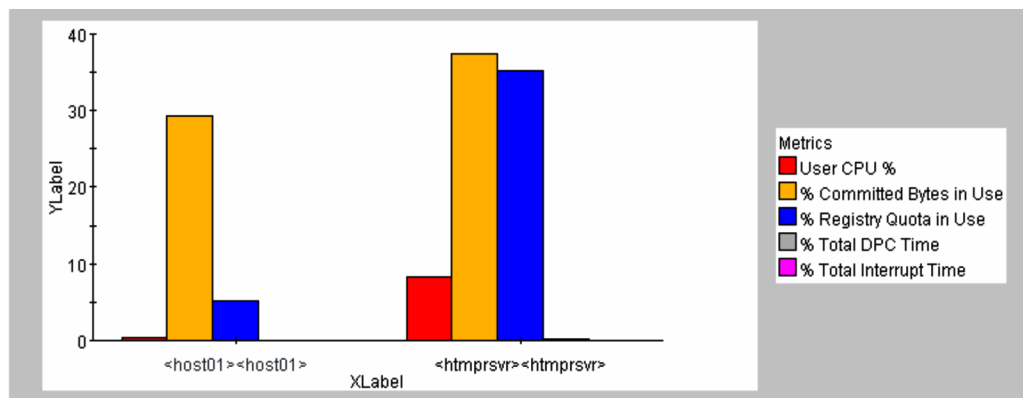


Figure 4-3 Sample Column Graph (Multiple-Instance Report)

Stacked Column Graphs

A stacked column graph is appropriate for setting multiple fields for display and displaying the fields for each instance as a stacked bar.

The axes are the same as for a column graph. If only one field is set, the graph becomes a column graph.



Note: In a stacked column graph, the fields are stacked even if they do not represent related data.

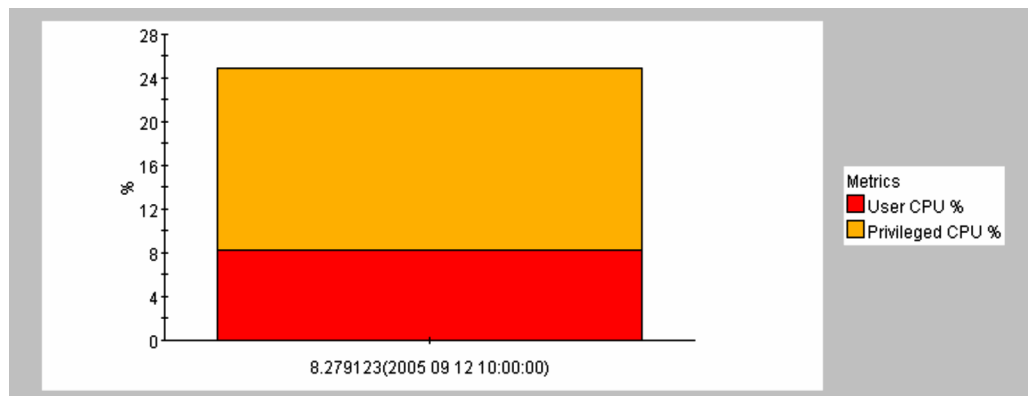


Figure 4-4 Sample Stacked Column Graph

Bar Graphs

A bar graph is a graph in which the positions of the X-axis and Y-axis of a column graph are rotated 90 degrees to the right. Therefore, the positions of the X-axis and Y-axis of a bar graph are the reverse of the positions of the axes of a column graph. The X-axis label specified in the chart options is displayed on the vertical axis, and the Y-axis label is displayed on the horizontal axis. The display characteristics for a bar graph are the same as for a column graph.

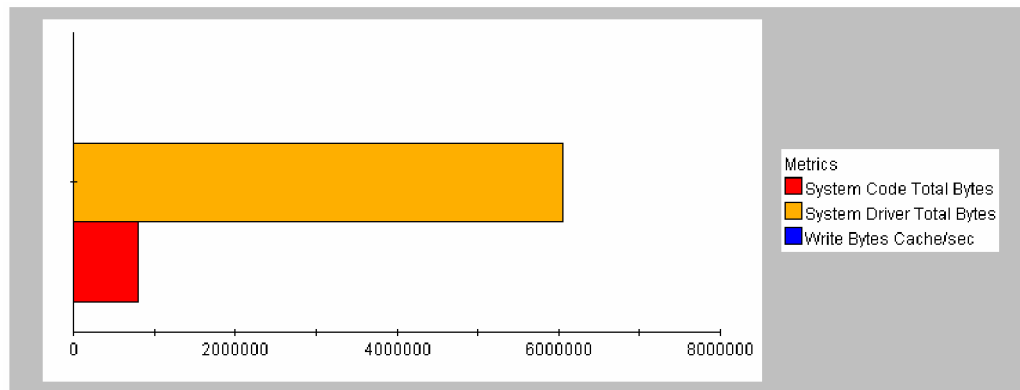


Figure 4-5 Sample Bar Graph

Stacked Bar Graphs

A stacked bar graph is a graph in which the positions of the X-axis and Y-axis of a stacked column graph are rotated 90 degrees to the right. Therefore, the positions of the X-axis and Y-axis of a stacked bar graph are the reverse of the positions of the axes of a stacked column graph. The X-axis label specified in the chart options is displayed on the vertical axis, and the Y-axis label is displayed on the horizontal axis. The display characteristics for a stacked bar graph are the same as for a stacked column graph.

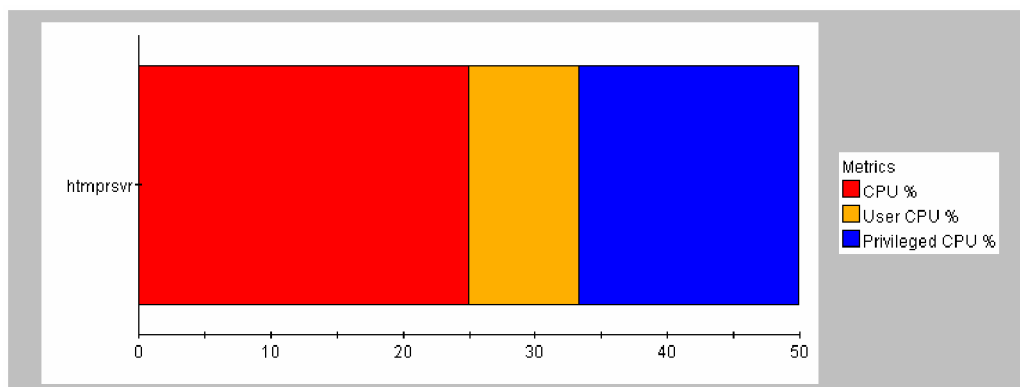


Figure 4-6 Sample Stacked Bar Graph

Pie Graphs

A pie graph is appropriate for displaying the value of each data field that is collected as a percentage of the total. For one instance, only one circle is displayed. For multiple instances, each instance is indicated by a separate circle.



Note: A pie graph does not account for the relationships among the fields.

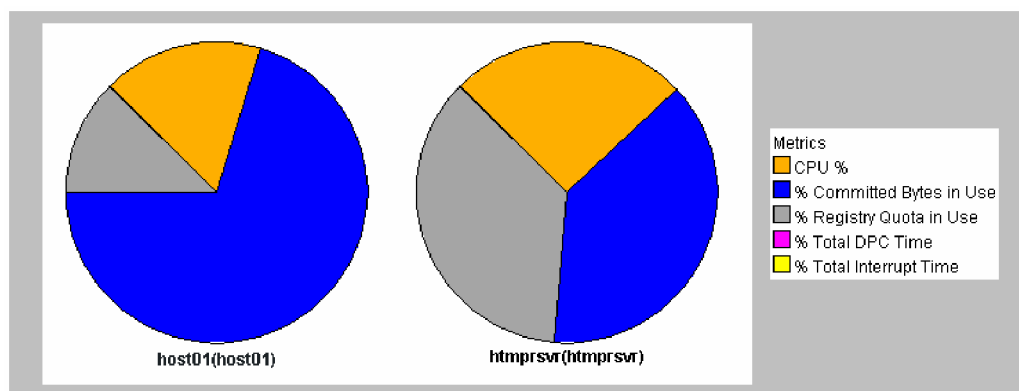


Figure 4-7 Sample Pie Graph Showing Multiple Instances

Line Graphs

Line graphs are best suited for viewing changes in values over time for one Agent with one instance. The X-axis represents time, and the Y-axis represents the usage status of the target resources. It is also possible to specify multiple Agents or multiple instances, but you can only define one field.

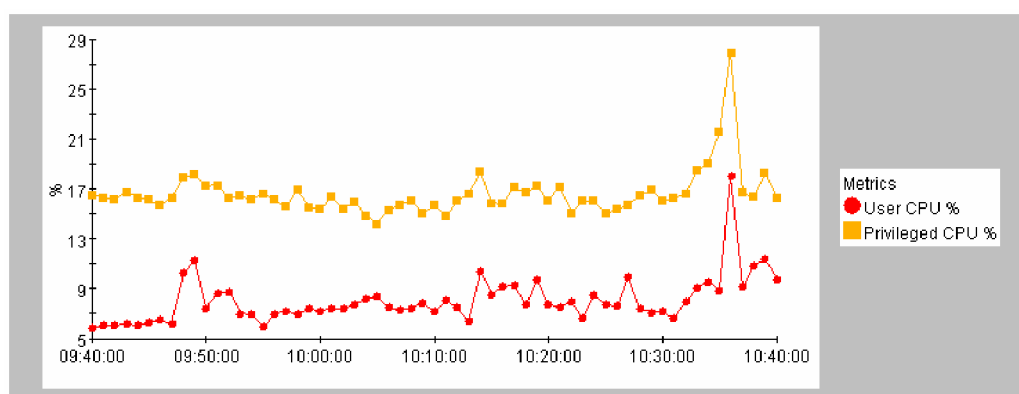


Figure 4-8 Sample Line Graph (Multiple fields, Single Instance)

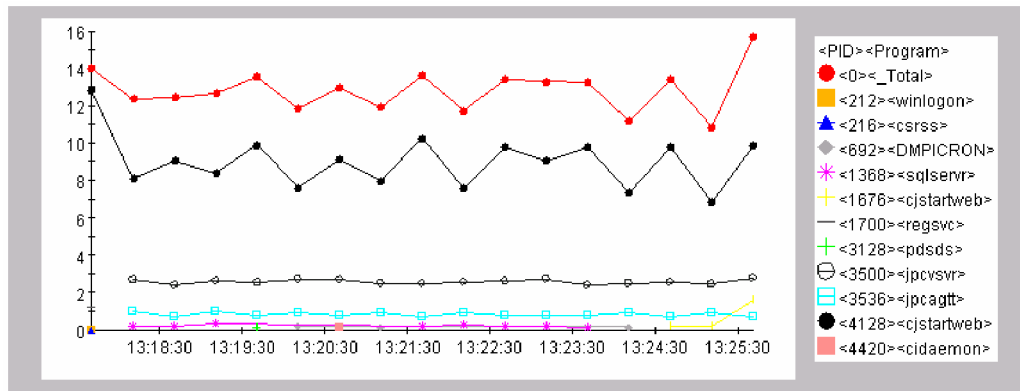


Figure 4-9 Sample Line Graph (Single field, Multiple Instances)

Area Graphs

An area graph is used to represent data value changes over time. The display characteristics are the same as for a line graph.

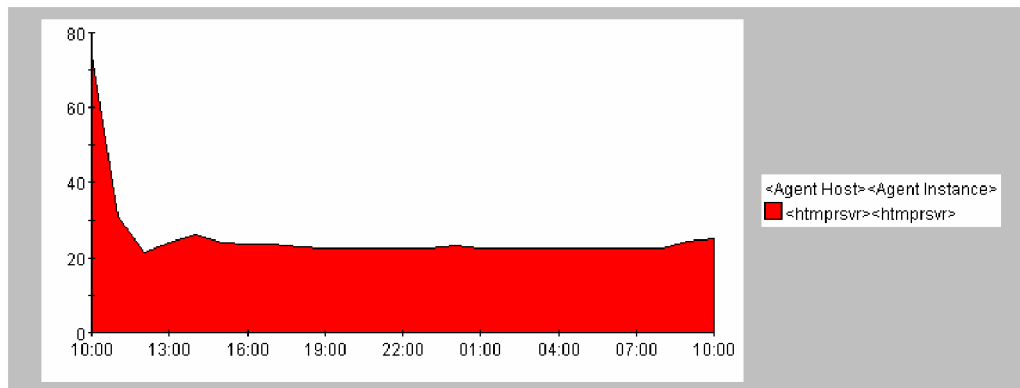


Figure 4-10 Sample Area Graph

Stacked Area Graphs

The display characteristics for a stacked area graph are the same as for a line graph. Note that the stacked areas do not account for relationships among the fields.

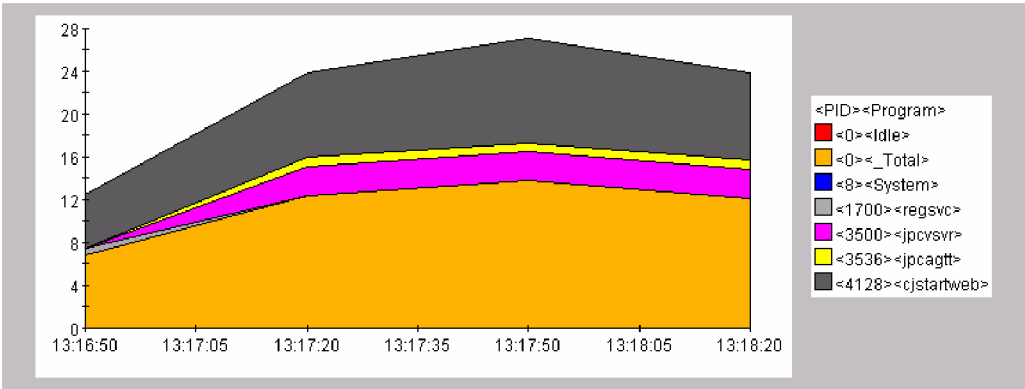


Figure 4-11 Sample Stacked area Graph

Lists

Lists enable the display of field values for each Agent or instance and are especially appropriate for displaying the information of multiple Agents or multiple instances. To display the information of another Agent or instance within the same data group, click the page navigation button displayed on the left side of the frame. To display the information of other data groups, click the data group navigation button on the report window menu bar. An item in blue indicates that there is a drill-down report available for that item.

Figure 4-12 shows a sample list.

	Date and Time	09 14 2005 13:00:00
	CPU %	28.0355
	Page Faults/sec	188.8508
1 OF 1	User CPU %	9.4552
1	Threads (Total)	14,941.0000

Figure 4-12 Sample List

Tables

A table is useful for viewing changes in field values over time. The default view is 20 lines of data in sorted order per page, which can be modified by changing the `displayCountPerPage` value in `config.xml`. To view additional lines, click the page scroll button at the top right of the table. The **Date and Time** field is added as the first and last columns of a table.

First Previous 1 - 20 OF 1440 Next Last					
Date and Time	CPU %	Page Faults/sec	User CPU %	Threads (Total)	Date and Time
09 13 2005 14:11:00	22.8287	114.5190	7.0848	975.0000	09 13 2005 14:11:00
09 13 2005 14:12:00	22.7355	115.1712	6.6581	974.0000	09 13 2005 14:12:00
09 13 2005 14:13:00	23.7870	150.6918	6.3467	974.0000	09 13 2005 14:13:00
09 13 2005 14:14:00	22.5923	117.6257	5.9127	973.0000	09 13 2005 14:14:00
09 13 2005 14:15:00	22.7822	107.6135	6.6929	973.0000	09 13 2005 14:15:00
09 13 2005 14:16:00	22.6897	112.3431	5.6531	973.0000	09 13 2005 14:16:00
09 13 2005 14:17:00	23.0769	122.6946	6.3271	977.0000	09 13 2005 14:17:00
09 13 2005 14:18:00	23.3351	158.7509	6.8663	976.0000	09 13 2005 14:18:00
09 13 2005 14:19:00	22.8144	108.7486	7.2985	977.0000	09 13 2005 14:19:00
09 13 2005 14:20:00	23.1424	146.1677	6.7595	976.0000	09 13 2005 14:20:00
09 13 2005 14:21:00	23.1173	119.7761	6.7961	977.0000	09 13 2005 14:21:00
09 13 2005 14:22:00	22.6831	112.3443	5.6183	975.0000	09 13 2005 14:22:00
09 13 2005 14:23:00	23.9164	152.8398	6.7337	975.0000	09 13 2005 14:23:00
09 13 2005 14:24:00	22.7440	113.3136	6.6632	975.0000	09 13 2005 14:24:00
09 13 2005 14:25:00	23.0312	115.2309	6.2484	974.0000	09 13 2005 14:25:00
09 13 2005 14:26:00	23.5853	249.9478	6.6860	983.0000	09 13 2005 14:26:00
09 13 2005 14:27:00	22.8527	120.4111	6.5773	982.0000	09 13 2005 14:27:00
09 13 2005 14:28:00	23.7595	153.1235	6.6947	980.0000	09 13 2005 14:28:00
09 13 2005 14:29:00	22.7871	112.5460	6.5290	980.0000	09 13 2005 14:29:00
09 13 2005 14:30:00	22.8287	117.3238	6.3763	979.0000	09 13 2005 14:30:00
First Previous 1 - 20 OF 1440 Next Last					

Figure 4-13 Sample Table

Notes on Displaying Reports

The following provides cautionary notes on displaying reports:

- Maximum number of report windows that can be displayed in the Performance Reporter browser
 - The maximum number of report windows that can be displayed in the Performance Reporter browser is about four.
 - For report windows that display the Agent information (report windows that display real-time reports), the maximum number of windows is about 10 for one Tuning Manager server system. If 11 or more windows are displayed, you might fail to retrieve data.
- Maximum number of data items that can be displayed in a report

In real-time reports, data from the last 30 collections can be displayed. If you display data from more than 31 collections, the data will be deleted in order from oldest to newest.

For historical reports, the maximum amount of data displayed for data groups is either the maximum number of records or the maximum number specified in the initialization file (`config.xml`).

- About data acquisition performance

If multiple real-time reports are displayed at the same time, data acquisition performance might deteriorate.

- Limitation of real-time report display

When multi-instance records are collected in an Agent, the maximum number of instances that can be handled during a collection is 32,767. Therefore, when displaying a real-time report of multi-instance records in the browser, you can display no more than 32,767 instances.

Displaying Combination Reports

Combination reports are a feature that allows you to combine multiple historical reports in the same graph. Although normal reports allow you to display reports from multiple Agents in one graph, they must refer to the same records in the historical reports. By using a combination report, you can display multiple historical reports in the same graph regardless of the Agents used or the types of records in the reports. You can also compare one report with another by displaying the first report as reference data (a **baseline**) in the graph. For details on how to effectively use combination reports, see [Practical Uses for Combination Reports](#).

The following table describes whether combination reports can be displayed for each combination of graph type and graph options.

Table 4-1 Whether Combination Reports Can Be Displayed

Graph Type	Graph Selection	Graph Options	
		Show 3D Graph	Show Gridlines
Column graph	Yes	Yes	Yes
Stacked column graph	Yes	Yes	Yes
Bar graph	No	No	No
Stacked bar graph	No	No	No
Pie graph	No	No	No
Line graph	Yes	No (see Note)	Yes
Area graph	Yes	No (see Note)	Yes
Stacked area graph	Yes	No (see Note)	Yes

Legend:

Yes: Can be selected (can be specified)

No: Cannot be selected (cannot be specified)



Note: You can specify this, but the specification will be ignored.

The following figure shows an example of a combination report in which the reports to be compared and the baseline are displayed as different types of graphs. In this example, the baseline is displayed as a line graph, and the reports to be compared are displayed as column graphs.

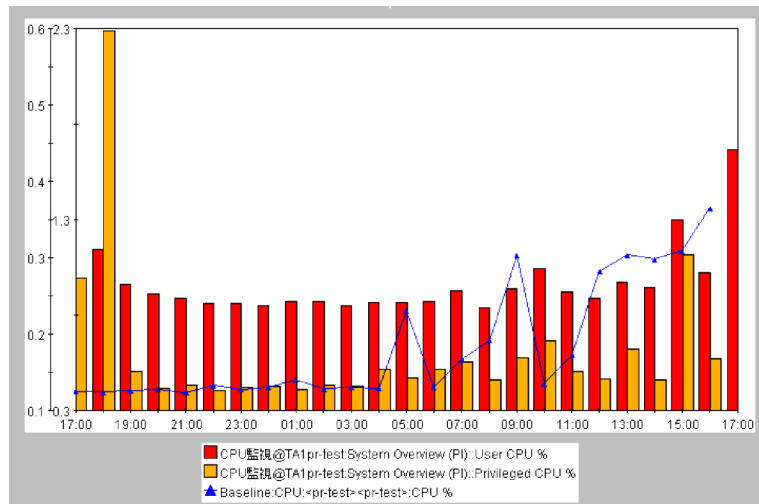


Figure 4-14 Example of a Displayed Combination Report

This section describes the following operations related to combination reports:

- Displaying combination reports
- Applying combination reports to real situations
- Notes on combination reports

Displaying Combination Reports

You can display the reports registered in a combination bookmark from the Agents tree or the Bookmarks tree.



Note: Some preparation is required before you can display a combination report. The first step is creating the combination bookmark, after which you can perform such tasks as registering a baseline, and editing the display conditions. For details on the procedures, see [Registering a Report in a New Bookmark](#) and [Operations for Combination Bookmarks](#).

Displaying a Combination Report from the Agents Tree

To display a combination report from the Agents tree:

1. In the Navigation frame of the Performance Reporter main window, choose the **Agents** link.
The Agents window appears.
2. In the Navigation frame, select the Agent whose report you want to display.
The selected Agent is marked with a check mark. If you select **Multiselect**, you can select multiple Agents.
3. In the Method frame, select the **Display Reports** method.
By default, the reports tree appears in the Information frame.

4. In the Information frame, choose **Bookmark** from the **Tree type** drop-down list box.
The bookmarks tree appears in the Information frame.
5. Select a combination bookmark from the bookmarks tree.
The registered reports associated with the bookmark appear as a combination report in a new window.

Displaying a Combination Report from the Bookmarks Tree

To display a combination report from the bookmarks tree:

1. In the Navigation frame of the Performance Reporter main window, choose the **Bookmarks** link.
The Bookmarks window appears.
2. Select the combination bookmark whose reports you want to display from the bookmarks tree in the Navigation frame.
The selected bookmark is marked with a check mark.
3. In the Method frame, select the **Display Reports** method.
The registered reports associated with the bookmark selected in step 2 appear as a combination report in a new window.

Practical Uses for Combination Reports

This section has examples of using combination reports in real-world situations.

Displaying Reports that Include Different Fields from the Same Record

When displaying a graph that includes different fields from the same record, you need to ensure that there is not a large disparity between the fields in terms of scale or units of measurement. Normal reports and combination reports deal with such a disparity in different ways:

- For normal reports
The highest value among the fields is used as the maximum value of the Y-axis. For this reason, displaying reports whose fields contain significantly different values might result in a graph that is difficult to understand.
- For combination reports
By assigning each report to a different series group, you can adjust the following aspects of how each report is displayed:
 - The maximum value of the Y-axis
 - Whether the Y-axis appears at the left or right side of the graph
 - The type of graph

The following figure shows an example of a graph created from a combination report. Two fields, **Transfer packet count** (maximum value: 33,000 pkt) and **Transfer speed** (maximum value: 1,500 ms), are plotted in this graph.

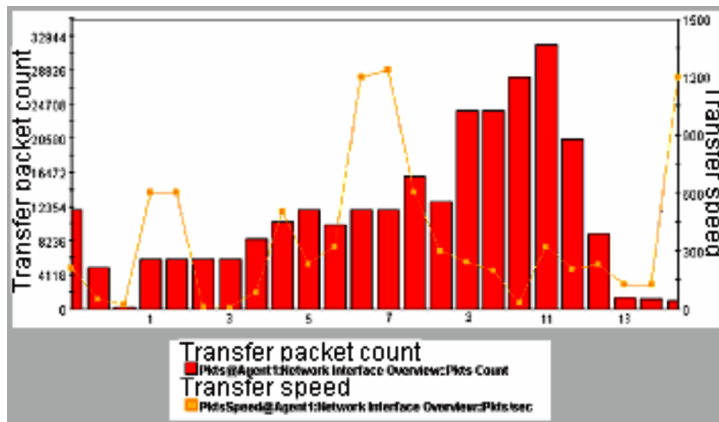


Figure 4-15 A Displayed Report that Includes Different Fields from the Same Record

To register this combination report:

1. Register the reports in a combination bookmark.

The reports used in this example are assumed to satisfy the following conditions:

 - The data field or fields displayed in the graph have the same scale.
 - All data in the graph has the same collection interval.
2. Edit the combination bookmark as follows:
 - Assign each report to a different series group.
 - For each series group, specify a suitable maximum value for the Y-axis.
 - For different series groups, ensure that the Y-axes are displayed at opposite sides of the graph.

Displaying Reports that Include Related Records from Different Agents

You can compare the values of related records from different Agent types by displaying them in one graph. However, you cannot display information from different Agents in a graph based on a normal report.

By using combination reports, you can display information from records from different Agents in the same graph by editing a combination bookmark and placing the relevant reports into the same series group. By choosing stacked column or bar as the graph type, you can visually check the total of the data from the different Agents.

The following figure shows an example of a graph created from a combination report. The values of CPU usage (as percentages) for the fields `Windows1` and `UNIX1` are shown in this graph.

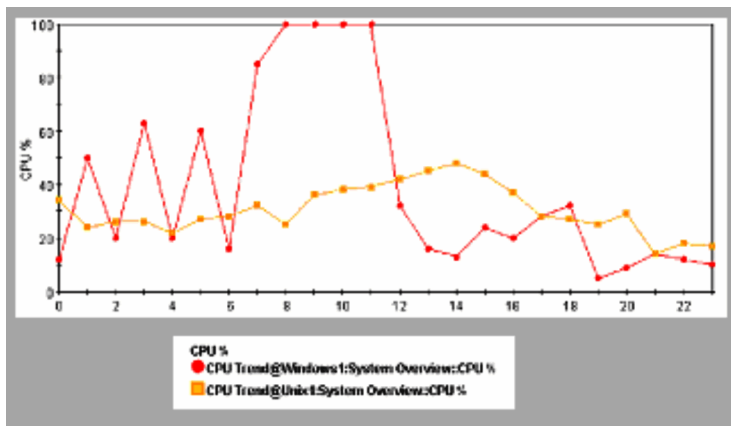


Figure 4-16 A Displayed Report that Includes Related Records from Different Agent Types

To register this combination report:

1. Register the reports in a combination bookmark.
The reports used in this example are assumed to contain data fields that are similar in scale and content.
2. Edit the combination bookmark and assign each report to the same series group.

Displaying Reports that Include Different Records from Different Agents

By using combination reports, you can display different records from different Agents in the same graph. You can use this feature to visually check how changes in one record correlate with changes in another.

To register this combination report:

1. Register the reports in a combination bookmark.
The reports used in this example are assumed to differ in scale and originate from different Agents, but to show a correlation.
2. Edit the combination bookmark as follows:
 - Assign each report to a different series group.
 - For each series group, specify the graph type and Y-axis value according to the scale and data of the report it contains.
 - For different series groups, ensure that the Y-axes are displayed at opposite sides of the graph.

Displaying a Report Together with a Baseline

By using combination reports, you can display past periodic data or data obtained during stable operation of the system in the graph as a baseline. By comparing this baseline with a current report, you can ascertain whether the system is operating normally and identify trends in system operation.

To register this combination report:

1. Register the report to be compared with the baseline as a combination bookmark.

In this example, this report is configured to collect data periodically.

2. Add a baseline to the combination bookmark.

In this example, the report registered as the baseline covers the same period or has the same collection interval as the report registered in step 1.

3. Edit the combination bookmark.

Assign the two reports to the same series group.

Notes on Combination Reports

This subsection provides cautionary notes on combination reports.

Notes on Graph Types and Graph Options

The **Show 3D graph** option can be set for any graph, but is ignored for graph types other than column or stacked column. To show a graph in 3D, the following conditions must be met:

- One or two series groups are specified. If two series graphs are specified, the Y-axis for one graph appears on the left side, and the Y-axis for the other appears on the right side.
- The graph types of any series groups to be displayed satisfy one of the following conditions:
 - If only one series graph is specified, a column graph or stacked column graph is specified.
 - If two series graphs are specified, a column graph or stacked column graph is specified, along with a line graph.
 - If two series graphs are specified, a column graph or stacked column graph is specified, along with an area graph or stacked area graph.

The graph might not be drawn correctly in 3D if these conditions are not satisfied.

- The Show gridlines option can be set for any graph, but applies only to the first series group. This setting is ignored for all other series groups.

Notes on the Order in which Graphs Are Drawn

The graphs in a combination report are drawn in the following order:

1. Series groups are drawn in order from the first series group, with subsequent series groups being drawn over the earlier ones.
2. Registered reports in a series group are displayed in the order in which the reports are registered in the series group, with subsequent registered reports being drawn over the top of the earlier ones.
3. Fields in a registered report are displayed in the order in which they appear in the report, with subsequent fields being drawn over the top of the earlier ones.

The following figure describes the order in which graphs are drawn.

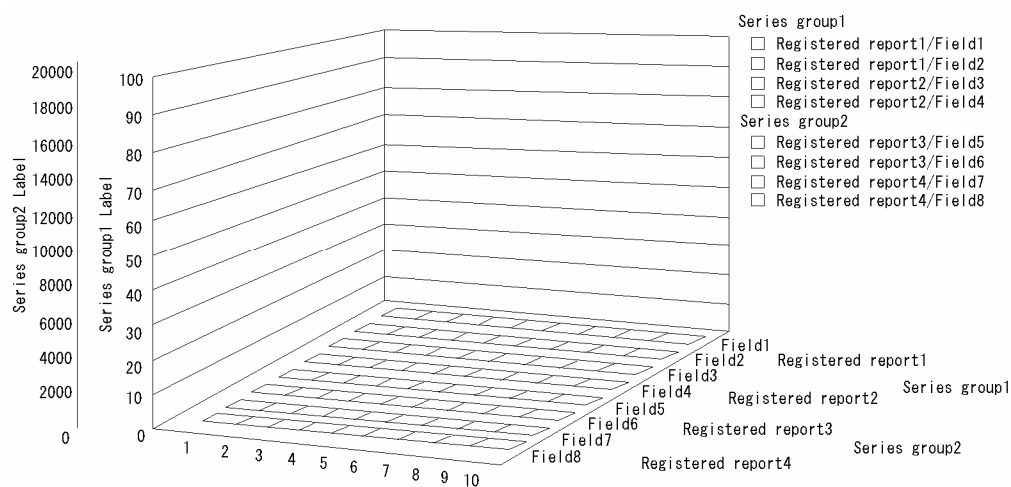


Figure 4-17 Image showing the order in which graphs are drawn

The specific order for 1. and 2. above is determined by the series group settings you specify when defining the combination bookmark. Make sure that the settings you specify do not cause graphs to become hidden behind other graphs. The order of the fields described in 3. is determined by the settings in the report definition window.

The following exceptions apply to series groups that feature certain graph types:

- The graph for a series group with the graph type `Line` is drawn at the very front of the graph.
- The graph for a series group with the graph type `Column` or `Stacked column` and the **Show 3D graph** option specified is drawn at the very front of the graph.

Notes on the Horizontal Axis (X-Axis) and Vertical Axis (Y-Axis)

- You cannot use common settings that apply across the entire combination report.

For the Y-axis of each series group in a combination report, you can use either automatic scale adjustment (where the axis is adjusted to the maximum and minimum values of the actual data) or manual scale adjustment (where the maximum and minimum values are specified by the user). You can also choose whether to display the axis label on the left or right side of the graph.

- The X-axis for a combination report is one fixed time series.

Data collected over a date range or during an interval that does not match the X-axis is assumed to be missing some information and the system attempts to compensate for it. This might compromise the integrity of the graph. Also, because the collection interval for PD records is measured in seconds, the time series will not match. We recommend that you use a line graph when the data includes PD records.

Notes on the Number of Fields in a Report

- Although there are no restrictions on the number of fields in a combination report, the system might be unable to display the graph or legend in part or in its entirety when the report contains too many fields. In this case, either increase the magnification of the graph or use the following methods to restrict the number of fields displayed in the graph. (We recommend that graphs display no more than approximately 20 fields.)
 - Edit the combination bookmark to remove some of the reports from the graph.
 - Edit the report definitions to contain fewer fields, and then re-create the registered reports.
 - Edit the report definitions to apply filter conditions, and then re-create the registered reports.
 - Re-create the registered reports using shorter display names for the fields than the default field names.

In environments where the number of lines in the legend exceeds the following limits, the graph or legend might be missing or cut off, or the graph might appear alongside the legend:

- 100% magnification: Legend approx. 20 lines
- 200% magnification: Legend approx. 30 lines
- 400% magnification: Legend approx. 40 lines
- 600% magnification: Legend approx. 50 lines
- 800% magnification: Legend approx. 60 lines

- When the legend for a combination report contains too many characters, part of the legend might be cut off. In this case, either increase the magnification of the graph or use the following methods to restrict the number of characters displayed in the legend:
 - Shorten the report names and then re-create the registered reports.
 - Re-create the registered reports using shorter display names for the fields than the default field names.
 - Reduce the number of bound agents and then re-create the registered reports.

In environments where the number of characters in the legend exceeds the following limits, the legend might be cut off:

- 100% magnification: Approx. 80 characters
- 200% magnification: Approx. 120 characters
- 400% magnification: Approx. 160 characters
- 600% magnification: Approx. 200 characters
- 800% magnification: Approx. 240 characters

Notes on Series Group Settings

At least one registered report must be assigned to a series group. No graph is displayed if none of the series groups contain any registered reports or if the combination bookmark contains only a baseline.

Notes on the Date Range of Records

When you set the date range of a report to a **Within the past** xxx option (for example, **Within the past hour**), the report is updated with the data from that time period up to the present time when you choose **Refresh** in the report window. The start time of the baseline remains unchanged.

If you choose **Specify when displayed** as the date range, the **Start time** and **End time** set for the report and the start time of the baseline remain unchanged when you choose **Refresh** in the report window.

Baseline Display Periods

The **Start time** setting for the baseline display period is determined automatically based on the current time when the combination report was started and the **Date range** and **Report interval** settings for the report display period. When you change these settings, the **Start time** setting for the baseline display period is set to the **Start time** setting for the report display period.

When you choose **Refresh** in the report window, the **Start time** and **End time** settings for the report display period might change depending on the **Date range** setting. However, the **Start time** setting for the baseline display period will remain unchanged.

Changes to the **Start time** setting for the baseline display period or the baseline data do not affect the starting points and ending points of graphs created from combination reports. However, when the report displayed with the baseline contains only one piece of data (data with the same starting point and ending point), the graph's starting point and ending point might be set to the range of the data collected as the baseline. The starting point and ending point of the actual display period for the graph are determined based on the data present in the range from the **Start time** to the **End time** in the report display period settings.

The **Start time** setting for the baseline display period applies to the individual baseline. When a baseline contains data from multiple fields each with different start times, the field data with the earliest start time in the time series after the **Start time** setting for the baseline display period serves as the starting point. All other fields are displayed according to the start times determined when the baseline data was saved.

When data from multiple fields with different start times is registered as a baseline, the graph is drawn with the field data earliest in the time series, with the **Start time** setting for the baseline display period serving as the starting point. In this case, the relative start positions of each subsequent field are preserved.

Exporting Reports

Performance Reporter can export reports to files in CSV or HTML format from the GUI or CLI. The resulting files will be in UTF-8 encoding.

Example CSV Output

- CSV data is output as data header 1, data header 2, and then data. Data header 1 consists of a line space, the report name, and a line space. Data header 2 consists of either the column headings or the value set for a particular field. Data is displayed as one output row per record.
- The character set is determined by the setting for `characterCode` in `config.xml`.
- The linefeed code is specified for `lineSeparator` in `config.xml` (for details about `config.xml` settings, see the chapter that describes initial settings for Performance Reporter in the *Hitachi Tuning Manager Server Administration Guide*).
- The end-of-file code is `<EOF>`.
- The item delimiter is the comma. If a data value includes a comma (,), a double quotation mark ("), or a linefeed code, the entire data value must be enclosed in double quotation marks (" ").
- The date is displayed in the default format set by the locale or as specified for `selectFormat` of `config.xml` (for details about `config.xml` settings, see the chapter that describes initial settings for Performance Reporter in the *Hitachi Tuning Manager Server Administration Guide*).

For details about `config.xml` settings, see the *Hitachi Tuning Manager Server Administration Guide*.

OS Memory Usage Status

```
Date and Time,Available Mbytes,Cache Faults/sec,Page Faults/sec,Pages/sec,Cache Mbytes
2008 02 03 14:00:00,690.7590494791667,65.06213,151.1999,2.8140954E-4,263.6002604166667
2008 02 03 15:00:00,691.3212890625,64.71966,151.05672,0.0149437655,263.06458333333333
2008 02 03 16:00:00,691.5151692708333,64.03657,150.37756,8.3009456E-4,262.8904296875
2008 02 03 17:00:00,691.222265625,64.6702,151.2481,0.017812008,263.01080729166665
2008 02 03 18:00:00,691.578515625,64.91319,151.4795,0.009132121,262.6635416666667
2008 02 03 19:00:00,691.4858723958333,63.86416,150.23509,0.006094293,262.657421875
2008 02 03 20:00:00,691.1993489583333,64.38845,150.73407,2.7667318E-4,263.0365234375
2008 02 03 21:00:00,691.1513020833333,65.76288,152.81062,2.766979E-4,263.108984375
2008 02 03 22:00:00,691.0833984375,64.33631,150.85258,0.01509356,263.07135416666665
2008 02 03 23:00:00,690.6744791666666,64.32679,150.42836,2.7669792E-4,263.4702473958333
2008 02 04 00:00:00,690.4669921875,65.400246,151.78809,2.7666002E-4,263.67552083333334
2008 02 04 01:00:00,690.4067708333333,64.3513,150.73225,8.3945104E-4,263.77265625
2008 02 04 02:00:00,690.1552083333333,66.63008,155.3929,0.014942032,263.87083333333334
2008 02 04 03:00:00,689.6011067708333,64.88078,151.24939,2.8144827E-4,264.484375
2008 02 04 04:00:00,687.612109375,66.7232,159.27214,0.014813608,264.52330729166664
2008 02 04 05:00:00,685.6444661458333,63.935436,150.31097,2.7685877E-4,264.625390625
2008 02 04 06:00:00,685.1075520833333,64.50598,151.05138,0.016598152,265.02890625
2008 02 04 07:00:00,685.4658203125,75.615715,165.1536,0.002499034,264.7580078125
2008 02 04 08:00:00,685.2817057291667,63.928543,150.4751,0.009131085,264.84348958333334
2008 02 04 09:00:00,685.1220052083333,64.968376,152.30461,0.02020087,264.8363932291667
2008 02 04 10:00:00,685.076953125,64.87601,153.53441,0.0019363279,265.08391927083335
2008 02 04 11:00:00,682.5983072916666,217.01251,326.24457,0.5453795,265.5525390625
2008 02 04 12:00:00,673.918359375,64.37693,151.1967,0.017475437,266.07057291666666
2008 02 04 13:00:00,672.880859375,78.13974,170.44168,0.0022138932,266.99329427083336
2008 02 04 14:00:00,672.8029947916667,79.5567,177.41238,0.05758346,268.3528645833333
```

Figure 4-18 Sample CSV Output for System Overview (Text)

OS Memory Usage Status					
Date and Time	Available Mbytes	Cache Faults/sec	Page Faults/sec	Pages/sec	Cache Mbytes
2008 02 03 14:00:00	690.7590495	65.06213	151.1999	2.81E-04	263.6002604
2008 02 03 15:00:00	691.3212891	64.71966	151.05672	0.014943766	263.0645833
2008 02 03 16:00:00	691.5151693	64.03657	150.37756	8.30E-04	262.8904297
2008 02 03 17:00:00	691.2222656	64.6702	151.2481	0.017812008	263.0108073
2008 02 03 18:00:00	691.5785156	64.91319	151.4795	0.009132121	262.6635417
2008 02 03 19:00:00	691.4858724	63.86416	150.23509	0.006094293	262.6574219
2008 02 03 20:00:00	691.199349	64.38845	150.73407	2.77E-04	263.0365234
2008 02 03 21:00:00	691.1513021	65.76288	152.81062	2.77E-04	263.1089844
2008 02 03 22:00:00	691.0833984	64.33631	150.85258	0.01509356	263.0713542
2008 02 03 23:00:00	690.6744792	64.32679	150.42836	2.77E-04	263.4702474
2008 02 04 00:00:00	690.4669922	65.400246	151.78809	2.77E-04	263.6755208
2008 02 04 01:00:00	690.4067708	64.3513	150.73225	8.39E-04	263.7726563
2008 02 04 02:00:00	690.1552083	66.63008	155.3929	0.014942032	263.8708333
2008 02 04 03:00:00	689.6011068	64.88078	151.24939	2.81E-04	264.484375
2008 02 04 04:00:00	687.6121094	66.7232	159.27214	0.014813608	264.5233073
2008 02 04 05:00:00	685.6444661	63.935436	150.31097	2.77E-04	264.6253906
2008 02 04 06:00:00	685.1075521	64.50598	151.05138	0.016598152	265.0289063
2008 02 04 07:00:00	685.4658203	75.615715	165.1536	0.002499034	264.7580078
2008 02 04 08:00:00	685.2817057	63.928543	150.4751	0.009131085	264.8434896
2008 02 04 09:00:00	685.1220052	64.968376	152.30461	0.02020087	264.8363932
2008 02 04 10:00:00	685.0769531	64.87601	153.53441	0.001936328	265.0839193
2008 02 04 11:00:00	682.5983073	217.01251	326.24457	0.5453795	265.5525391
2008 02 04 12:00:00	673.9183594	64.37693	151.1967	0.017475437	266.0705729
2008 02 04 13:00:00	672.8808594	78.13974	170.44168	0.002213893	266.9932943
2008 02 04 14:00:00	672.8029948	79.5567	177.41238	0.05758346	268.3528646

Figure 4-19 Sample CSV Output for System Overview (Table)

HTML Format

The format of HTML reports exported from the GUI differs from the format of HTML reports exported by using a command. For details about the format of HTML reports exported by using a command, see the *Hitachi Tuning Manager Command Line Interface Guide*. This section explains the format and shows an example only of HTML reports that are exported from the GUI.

A report in HTML format is composed of four parts: a report header area, a graph area, a list area, and a table area.

The following table describes the content displayed in each part, and the conditions under which the part is displayed, for each type of report or bookmark.

Table 4-2 Content and Display Conditions for Each Part (When Output from the GUI)

Part	Subject of Output Operation		
	Report (Bookmark)	Combination Report	Event History Report
Report header area	Displays the name of the report definition, the folder where the report definition is stored (see Note 1), the name of the Agent (see Note 2), and the data acquisition time (see Note 4).	Displays the name of the combination bookmark, the path of the bookmark in the bookmarks tree (see Note 3), and the data acquisition time (see Note 4).	Displays the string Event History and the data acquisition time (see Note 4).
Graph area	The same image of the graph is displayed as the one that appears in the report window.	The same image of the graph is displayed as appears in the report window for the combination report.	Not displayed
List area	Displays the list data and instance numbers that appear in the report window.	Not displayed (combination reports cannot be output in list format)	Not displayed
Table area	All data is displayed on one page in table format.	Not displayed (combination reports cannot be output in table format)	All data is displayed on one page in table format.



Note 1: The folder where the report definition is stored appears in the format Parent Folder *folder-path-name* and is displayed as an absolute path.



Note 2: Agent names appear in the format Agents *agent-name*. When more than one Agent name is specified, the names are separated by commas. No Agent name is displayed for combination reports.



Note 3: The path of the bookmark in the bookmarks tree is displayed as an absolute path.



Note 4: The data acquisition time appears in the format `Time (time)`. This is the same information that appears in the Menu-bar frame of the report window.

The HTML is output in UTF-8 encoding; the character set and linefeed code settings in the section of the `config.xml` file that describes the export format are ignored.



Note: Each time you choose the **Print** menu, a new window opens. Any print windows that have already been opened continue to display the same data. The print windows close when you close the parent window.

Exporting Reports

Use the GUI or the `jpcrpt` command to export reports. For details about the command, see the *Hitachi Tuning Manager Command Line Interface Guide*.

To export a report using the GUI:

1. Display the report window for the report you want to output in HTML format.
2. If the report you want to output is a real-time report, click the **Stop** menu on the **Report** page of the report window.

This stops the real-time report from refreshing automatically, and the **Export** and **Print** menus appear.

For historical reports, these menus appear as soon as you display the report window.

3. Choose the **Export** or **Print** menu on the **Report** page of the report window.

If you choose the **Export** menu, the File Download window appears. Specify a file name, and then save the file. The default file name is `Export.csv`.



Note: If you choose the **Print** menu, the results of the report appear in a new window in a format suitable for printing or saving to a disk. You can save the displayed report from the browser by specifying the option that saves the entire Web page.

Bookmarking Reports

By using Performance Reporter, you can bookmark a report and perform short-term display of reports. You can use a bookmark to display reports in fewer steps and to simultaneously display reports for different Agents or reports that have different report definitions. This section provides an example in Windows to show how to bookmark a report and how to perform operations for the folders, bookmarks, and bookmarked reports that you create. This section also explains how to register baselines that are used for displaying combination reports to combination bookmarks and how to edit combination bookmarks.

You bookmark reports using the Bookmark Registration window. Figure 4-20 shows the Bookmark Registration window.



Note: When displaying reports from bookmarks, one Display Reports window will be displayed for each registered report. Displaying more windows requires more time. Therefore, we recommend that you register no more than 10 reports in one bookmark.

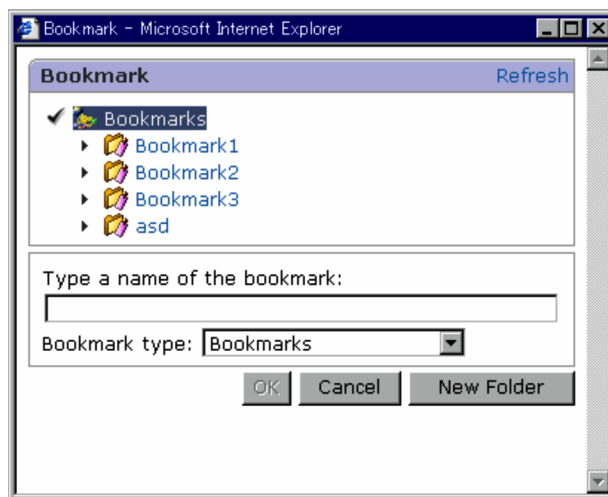


Figure 4-20 Sample Bookmark Registration Window

The Bookmark Registration window lets you specify the following settings:

- The **Refresh** link updates the displayed information.
- The **Bookmarks** button () displays a tree of bookmark folders, bookmarks, and bookmarked reports.
- The *name-of-bookmark-folder* () displays a list of stored bookmarks.
- The *bookmark-name* () displays a list of bookmarked reports.

- The *report-name* () displays a list of reports. *report-name* is displayed as *report-name @ agent-name*. If multiple Agents exist, their names are displayed separately by commas.
- The **Type a name of the bookmark** field lets you specify the name of the bookmark. Values specified can be from 1 to 64 characters.
- The **Bookmark type** drop-down list lets you select **Bookmarks** or **Combination bookmarks** as the bookmark type of the report you want to register. You cannot register a real-time report in a combination bookmark.
- The **New Folder** button creates a new folder and displays the **Bookmark Folder Creation** window.

Registering a Report in a New Bookmark

To create a new bookmark for a report:

1. Click the **Bookmark** link in the common menu of the report window. The Bookmark Registration window is displayed, with **Bookmarks** selected in the bookmark tree.
2. To create a new folder for storing bookmarks, click **New Folder**. The Bookmark **Folder Creation** window is displayed.
3. Below **Create a new bookmark folder**, enter the name of the folder in **Name**. You can specify from 1 to 64 characters.
4. Click **OK**. The Bookmark Registration window reappears. The **Level A** folder is selected in the bookmark tree.
5. In **Type a name of the bookmark**, enter the name of the report bookmark.
6. From **Bookmark type**, select the type of bookmark.

To register the report in a bookmark, select **Bookmarks**. To register the report in a combination bookmark, select **Combination Bookmarks**.

Note that you cannot register a real-time report in a combination bookmark.

7. Click **OK**. The bookmark for which **Bookmark A** was entered in **Type a name of the bookmark** is created in the **Level A** folder. The report is registered in the created bookmark **Bookmark A**.

Registering a Report in an Existing Bookmark

To register a report in a previously created bookmark:

1. In the common menu of the report window, click the **Bookmark** link. The **Bookmark Registration** window appears, with **Bookmarks** selected in the bookmark tree.
2. Select the bookmark in which you want to store the report. **Click OK to add the report to the selected bookmark.** is displayed.

You cannot register the following types of reports in a combination bookmark:

- Real-time reports
 - Reports that do not display graphs
 - Reports for which a display key field is specified
3. Click **OK**. The report is registered in the bookmark.

Operations for Combination Bookmarks

To display combination reports, you need to create a combination bookmark, register reports to the bookmark, and then perform the following operations:

- Register a baseline in the combination bookmark.
- Edit the combination bookmark.

This section describes how to register a baseline in a combination bookmark and how to edit a combination bookmark. For details on creating combination bookmarks and registering reports, see [Registering a Report in a New Bookmark](#).

Registering Baselines in Combination Bookmarks

To register a baseline in a combination bookmark:

1. In the Performance Reporter window, display the report window for the report that you want to register as a baseline in a bookmark.

For details on the procedure to display the report window, see [Generating Reports](#).

2. Select the **Baseline** tab in the report window.

The Baseline window appears in a new window.

3. Select a combination bookmark from the Bookmarks tree, and then enter the name of the baseline in **Specify the baseline name** (see Figure 4-21).

Specify the baseline name Enter no more than 64 characters.

4. Click the **OK** button.

The baseline is registered in the combination bookmark.

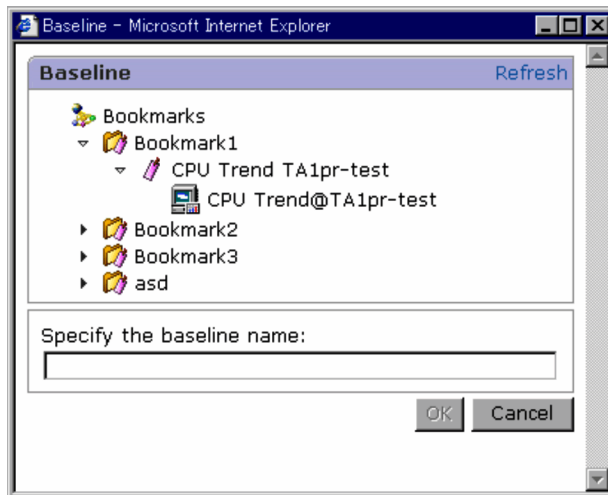


Figure 4-21 Baseline Window

Editing Combination Bookmarks

To modify the display and other conditions of a combination bookmark:

1. In the Navigation frame of the Performance Reporter main window, choose the **Bookmarks** link.

The Bookmarks window appears.

2. Select the combination bookmark you created from the Bookmarks tree of the Navigation frame.

The selected bookmark is marked with a check mark.

3. From the Method frame, choose the **Edit** method.

In the Information frame, the Edit window appears.

4. Edit the display conditions as required.

You can group up the separate reports of a combination report in the **Series group settings** area of the Edit window as a **series group**. You can then specify and modify the following settings for each series group (see Figure 4-22). The items in **Series group settings** are as follows:

Registered reports

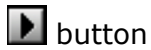
Displays the reports and baselines that are registered as combination bookmarks.

Select a registered report or baseline to be displayed as a series group and use the  button and the  button to move it to **Displayed items**.

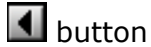
The names of the registered reports appear in ascending order.

The names of the baselines appear in ascending order following the displayed registered reports.

The registered reports and the baselines displayed in **Registered reports** do not appear in the graph.



button
Adds the registered report or baseline selected in **Registered reports** to **Displayed items**.



button
Returns the registered report or baseline selected in **Displayed items** to **Registered reports**.

Series group

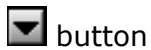
To group the reports registered as a combination bookmark, select a series group from the drop-down list. The default is **Series group 1**. You can use a maximum of five series groups.

Displayed items

Displays the registered reports and baseline moved from **Registered reports**. To change the order of the items, use the  button and the  button.



button
Moves the registered report or baseline selected in **Displayed items** up one position. You can move multiple registered reports or baselines at the same time.



button
Moves the registered report or baseline selected in **Displayed items** down one position. You can move multiple registered reports or baselines at the same time.

If no registered reports or baselines are listed in **Displayed items**, no graph appears in the combination reports whose group is specified in **Series group**.



Note: Because the **Registered reports** and **Displayed items** areas have fixed widths, you might not be able to view the complete name of a registered report or baseline if it is too long. If the name is too long, check the navigation tree at the left. Note that the order of objects in Registered reports is the same as the order in the navigation tree.

Graph type

Select the types of graphs you want to display for each specified series group.

You can select a graph type from the following (the default is **Line**):

Column (see **Note**): Displays time-series column graphs showing the values of all fields in registered reports that are specified for the series group.

Stacked column (see **Note**): Displays time-series column graphs that contain piled up data and that show the values of all fields in registered reports that are specified for the series group.

Line: Displays time-series line graphs showing the values of all fields in registered reports that are specified for the series group.

Area: Displays time-series area graphs showing the values of all fields in registered reports that are specified for the series group.

Stacked area: Displays time-series area graphs that contain piled up data and that show the values of all fields in registered reports that are specified for the series group.



Note: To display **Stacked column** or **Stacked area**, select **Show 3D graph** in **Graph Options**. If you want to display 3D graphs, the conditions below must be satisfied or such graphs will not be displayed correctly.

- One or two series groups are specified. If two series graphs are specified, the Y-axis for one graph appears on the left side, and the Y-axis for the other appears on the right side.
- The graph types of any series groups to be displayed satisfy one of the following conditions:
 - If only one series graph is specified, a column graph or stacked column graph is specified.
 - If two series graphs are specified, a column graph or stacked column graph is specified, along with a line graph.
 - If two series graphs are specified, a column graph or stacked column graph is specified, along with an area graph or stacked area graph.

Series group name

The name specified here is displayed as the title of the legend or the label of the Y-axis. Use 0 to 40 characters to specify the name of the series group.

Manually set the Y-axis value

Select this check box to manually set the Y-axis for the specified series group. When this check box is selected, you can specify values in **Max. value** and **Min. value** for the Y-axis of the series group.

Max. value: Enabled when **Manually set the Y-axis value** is selected. Specify the value to use as the maximum value of the Y-axis of the specified series group graph.

Min. value: Enabled when **Manually set the Y-axis value** is selected. Specify the value to use as the minimum value of the Y-axis of the specified series group graph.

Y-axis display position

Specify the display position of the Y-axis for the series group. Select **Left side** or **Right side** as the display position of the Y-axis of the series group specified in **Series group**. The default is **Left side**.

5. Click the **OK** button. As shown in Figure 4-22, the series group settings are applied as the display conditions for the combination report.

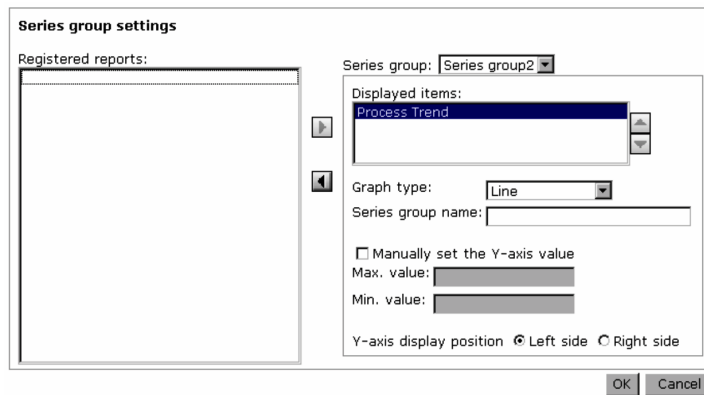


Figure 4-22 Edit Window

Refreshing a Report in a Bookmark

To refresh a report registered in a bookmark:

1. Click the **Bookmark** link in the common menu of the report window. The **Bookmark Registration** window displays with **Bookmarks** selected in the bookmark tree.
2. Click the report within the bookmark that you want to refresh. The report is selected. **Click OK to update the selected report.** displays.
3. Click **OK**. A message box for confirming the refresh is displayed.
4. To refresh the selected report, click **OK**.

Working with Bookmark Folders

Following are the types of tasks you can complete with bookmark folders:

- Adding a bookmark folder
- Changing the names of a bookmark folder
- Deleting a bookmark folder

Figure 4-23 shows the **Bookmarks** link of the Navigation frame in the main window, where you can perform folder operations.



Figure 4-23 Bookmarks Link

Following are descriptions of the items displayed in each frame of the main window:

Navigation Frame

- **Refresh** updates the displayed information.
- The **Bookmarks** button (📌) displays a tree of bookmark folders, bookmarks, and bookmarked reports.
- The *name-of-bookmark-folder* button (📁) displays a list of stored bookmarks.
- The *bookmark-name* button (📌) displays a list of bookmarked reports.
- The *report-name* button (📄) displays a list of reports. *report-name* is displayed as *report-name@agent-name*. If multiple Agents exist, their names are displayed separately by commas.

Method Frame

The methods displayed in the Method frame differ depending on the object selected. For details, see the explanation for each operation.

Information Frame

The windows displayed in the Information frame differ depending on the selected method. For information about these windows, see the explanation for each operation.

Adding a Bookmark Folder

To add a folder to a bookmark:

1. In the Navigation frame of the main window, select the **Bookmarks** link. The bookmark tree is displayed.
2. In the bookmark tree, click **Bookmarks** or a folder within to which you want to add a folder. The folder is selected.
3. Select the **New Folder** method in the Method frame. The **New Folder** window is displayed in the Information frame.
4. Enter the name of the folder in **New name of the bookmark folder**.
5. Click **OK**. A folder is added to the bookmark tree of the Navigation frame.

Changing the Name of a Bookmark Folder

To change the name of a folder:

1. In the Navigation frame of the main window, select the **Bookmarks** link. The bookmark tree is displayed.
2. In the bookmark tree, click the folder in **Bookmarks** whose name you want to change. The clicked folder is selected.
3. In the Method frame, select the **Rename** method. The **Rename** window is displayed in the Information frame. The current name of the folder is displayed in **Current name of the bookmark folder**.
4. Enter the new name for the folder in **New name of the bookmark folder**.
5. Click **OK**. The name of the selected folder is changed.

Deleting a Bookmark Folder

When you delete a bookmark folder, the folders, bookmarks, and reports within the folder are also deleted.

To delete a folder:

1. In the Navigation frame of the main window, select the **Bookmarks** link. The bookmark tree is displayed.
2. In the bookmark tree, click the folder in **Bookmarks** that you want to delete. The clicked folder is selected.
3. In the Method frame, select the **Delete** method. A message box for confirming the deletion is displayed.
4. To delete the selected folder, click **OK**. The selected folder is deleted.

Managing Report Bookmarks

You can perform the following tasks for bookmarks in the **Bookmarks** link of the main window of Performance Reporter:

- Accessing a Bookmark
- Changing the name of a bookmark
- Deleting a bookmark
- Displaying the properties of a bookmark

Accessing a Bookmark

To display a bookmarked report:

1. Select the **Bookmarks** link in the Navigation frame of the main window. The bookmark tree is displayed.
2. In the bookmark tree, click the bookmark containing the report you want to display. The clicked bookmark is selected.
3. In the Method frame, select the **Display Report** method. The report registered in the bookmark is displayed in the **Report** tab of the report window.

Changing a Bookmark Name

To change the name of a bookmark:

1. In the Navigation frame of the main window, select the **Bookmarks** link. The bookmark tree is displayed.
2. In the bookmark tree, click the bookmark in **Bookmarks** or in the bookmark folder whose name you want to change. The clicked bookmark is selected.
3. In the Method frame, select the **Rename** method. The **Rename** window is displayed in the Information frame. The current name of the bookmark is displayed in **Current name of the bookmark**.
4. Enter the new name for the bookmark in **New name of the bookmark**.
5. Click **OK**. The name of the selected bookmark is changed.

Deleting a Bookmark

To delete a bookmark and its associated reports:

1. In the Navigation frame of the main window, select the **Bookmarks** link. The bookmark tree is displayed.
2. In the bookmark tree, click the bookmark in **Bookmarks** or in a bookmark folder whose bookmark you want to delete. The clicked bookmark is selected.
3. Select the **Delete** method in the Method frame. A message box confirming deletion is displayed in the Information frame.
4. If you want to delete the selected bookmark, click **OK**. The selected bookmark is deleted.

Displaying Bookmark Properties

To display the properties of a bookmark:

1. In the Navigation frame of the main window, select the **Bookmarks** link.
2. From the displayed bookmark tree, click the bookmark whose properties you want to view. The bookmark is selected.
3. In the Method frame, select the **Properties** method. The Properties window is displayed in the Information frame (see Figure 4-24).

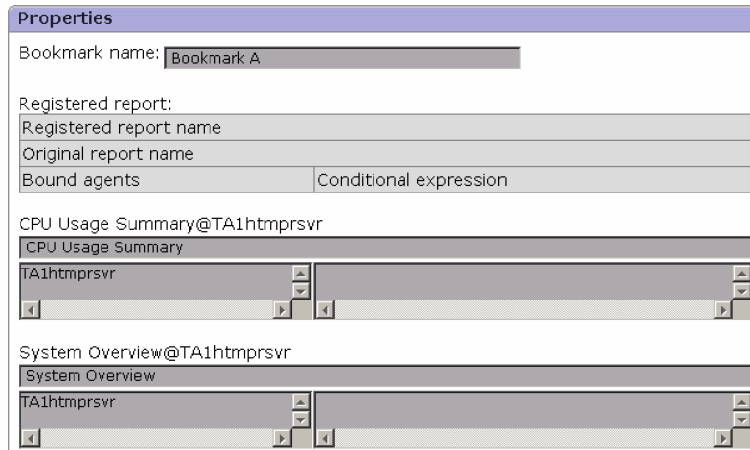


Figure 4-24 Properties Window

Following are descriptions of the Properties window's components:

Bookmark Name

Displays the name of the bookmark.

Registered report

Registered report name

Displays "*report-name @ agent-name*" for the name of the report registered in the bookmark. If there are multiple Agents, the Agent names are separated by commas and displayed.

Original report name

Displays the name of the report registered in the bookmark.

Bound agents

Displays the name of the Agent for the report registered in the bookmark. If there are multiple Agents, an Agent name is displayed on every other line.

Conditional expression

Displays the condition expressions of the report registered in the bookmark.

Working with Bookmarked Reports

You can display reports and delete reports in the **Bookmarks** link of the main window of Performance Reporter.

Displaying a Report

To display a report:

1. In the Navigation frame of the main window, select the **Bookmarks** link. The bookmark tree is displayed.
2. In the bookmark tree, click the report that you want to display. The clicked report is selected.
3. In the Method frame, select the **Display Report** method. The selected report is displayed in the **Report** tab of the report window.

You can also change the display conditions in the **Show Options** tab of the displayed report window to refresh a bookmarked report, and re-register a report under a different name.

Deleting a Report

To delete a report:

1. In the Navigation frame of the main window, select the **Bookmarks** link. The bookmark tree is displayed.
2. In the bookmark tree, click the report that you want to delete. The clicked report is selected.
3. In the Method frame, select the **Delete** method. A confirmation message is displayed in the Information frame.
4. To delete the selected report, click **OK**. The selected report is deleted.



Note: When you delete the last report registered in a bookmark, the bookmark is also deleted. In this case, a message box confirming the deletion is displayed.

Printing Reports

To print a report:

1. Display the report window for the report you want to print.
2. If the report you want to print is a real-time report, click the **Stop** menu on the **Report** page of the report window.

This stops the real-time report from refreshing automatically, and the **Export** and **Print** menus appear.

For historical reports, these menus appear as soon as you display the report window.

3. Choose the **Print** menu on the **Report** page of the report window.

The results of the report appear in a new window in a format suitable for printing or saving to disk.

4. In the new window, right-click anywhere, and then choose **Print**.

The print setup dialog box appears. The contents of the dialog box differ depending on the OS and the printer driver.



Note: If you want to print the list area and table area in color, make sure that your browser is set up to print background colors and images.

Stopping Performance Reporter

To close the main window of Performance Reporter and open a report window, choose **Exit** from the Menu-bar frame of the main window.

If the Report Tree Selection window was opened from the Main console, choose **Cancel** to close the window. The Report Tree Selection window also closes when a report window is displayed or when the user logs out from the Main Console.

If one or more report windows do not close when you close the main window, you can close them individually by selecting **Close**. Report windows might stay open if you do any of the following:

- Display more than 10 report windows.
- Open any report windows (including drilldown reports) when the Performance Reporter main window is closed.
- Launch more than one instance of Performance Reporter.
- Enter a URL in the main window.
- Use the browser's **Refresh** function.



Note: Even when there are fewer than 10 windows displayed, auto-refresh processing will be slow if auto-refresh is run for multiple real-time reports. In such cases, auto-refresh processing might also stop because the processing time exceeds the limit.

Customizing Reports

Main Console and Performance Reporter display reports that are predefined by the Tuning Manager server. Performance Reporter can display user-defined reports as well. You can use Performance Reporter to create user-defined reports.

This chapter describes how to create user-defined reports with Performance Reporter.

Note that the procedures described in this chapter assume that the Performance Reporter main window is displayed. For details about how to start Performance Reporter, see [Launching Performance Reporter](#).

- ☐ [Defining Reports Using a Solution Set](#)
- ☐ [Defining Reports Using Commands](#)
- ☐ [Defining Reports Using the Report Wizard](#)
- ☐ [Defining Reports](#)
- ☐ [Displaying Reports](#)
- ☐ [Displaying Report Properties](#)
- ☐ [Setting and Changing Report Display Conditions](#)
- ☐ [Deleting a User-defined Report](#)
- ☐ [Example of Creating a New Report](#)
- ☐ [Example of Customizing a Solution Set](#)
- ☐ [Example of Creating a Report When Filter Conditions Are Connected by OR](#)
- ☐ [Example of Creating a Line Graph \(Single Field, Multiple Instances\)](#)

Defining Reports Using a Solution Set

A solution set is a collection of reports and alarms that are provided by each Agent. In a solution set, all necessary information has already been defined. You can use a solution set to display pre-defined reports, or you can create a new report by customizing the solution set.

Using Commands to Define Reports

You can use commands to define reports. For details, see [Defining Reports Using Commands](#).

Defining Reports by Using the Report Wizard

To define reports by using the Report Wizard:

1. Copy the report definition of the solution set that you want to use. For details, see [Defining Reports](#).
2. Click the copied report definition, and then select **Edit** in the method frame.
3. Change the values specified in each window of the Report Wizard. For details, see [Defining Reports Using the Report Wizard](#).

For details about solution sets, see the *Hitachi Tuning Manager Hardware Reports Reference*, *Hitachi Tuning Manager Operating System Reports Reference*, or *Hitachi Tuning Manager Application Reports Reference*.

Defining Reports Using Commands

To display a report, you must first define the display format and display conditions for that report. You can define reports in Performance Reporter in either of two ways: by using the Report Wizard or by using commands.

When you use commands, you can define a report by specifying the XML parameter file of the report definition information in the `jpcrdef create` command argument.

The following figure shows how to define a report by using commands.

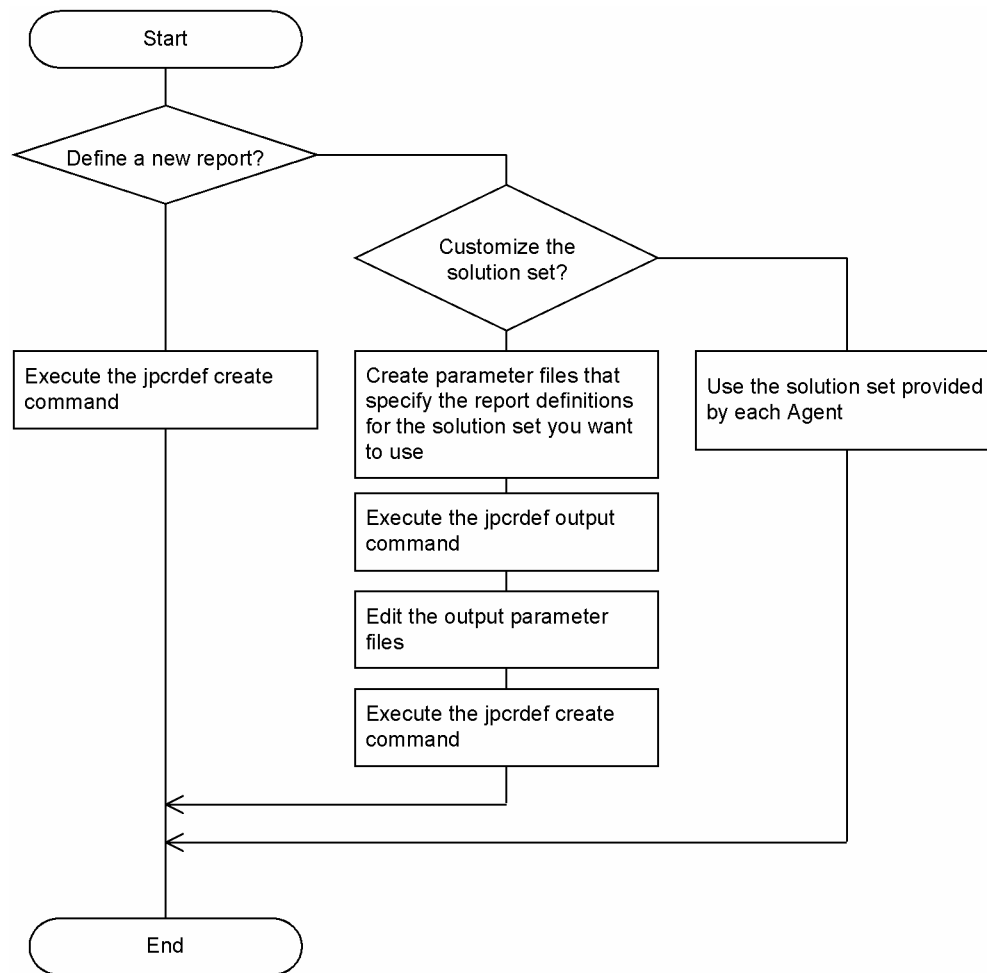


Figure 5-1 Using Commands to Define a Report

Defining a New Report

To define a new report by using a command:

1. Create an XML parameter file to define the required settings to create a new report.
2. Execute the `jpcrdef create` command with the parameter file created in step 1 specified as an argument. For details on the `jpcrdef create` command format, an example of coding the parameter file, and parameter details, see the *Hitachi Tuning Manager Command Line Interface Guide*.

Defining a Report by Customizing a Solution Set

You can use commands to define a report by customizing a solution set:

1. Create an XML parameter file that defines the name of the report definition of the solution set that you want to use and its directory.
2. Execute the `jpcrdef output` command with the parameter file created in step 1 specified as an argument. This command outputs the report definition to the XML parameter file.
3. Edit the output parameter file, and then execute the `jpcrdef create` command with this parameter file specified as an argument.

For details on the `jpcrdef output` and `jpcrdef create` command formats, examples of coding the parameter file, and parameter details, see the *Hitachi Tuning Manager Command Line Interface Guide*.



Note: If you are using an Agent whose version is earlier than 5.0 and execute the `jpcrdef create` command, a report might not be defined correctly and an error message might appear. In this case, follow the instructions in the message to solve the problem, and then redefine the report.

Defining Reports Using the Report Wizard

The Report Wizard leads you through the steps for defining reports. To define a report using the Report Wizard:

1. Open the main window of Performance Reporter.
2. Define a report folder.
3. Start the Report Wizard.
4. Define the name and type of the report.
5. Define the fields displayed in the report.
6. Define the display conditions for the fields in the report.
7. Define the information displayed in the report.
8. Define the display format for the report.
9. Define the drilldown reports.

The definitions for steps 4 through 9 above are performed in the windows of the Report Wizard. The items displayed on each screen, as well as the flow from screen to screen, depend on the settings specified during report definition.

Figure 5-2 shows the Report Wizard window.

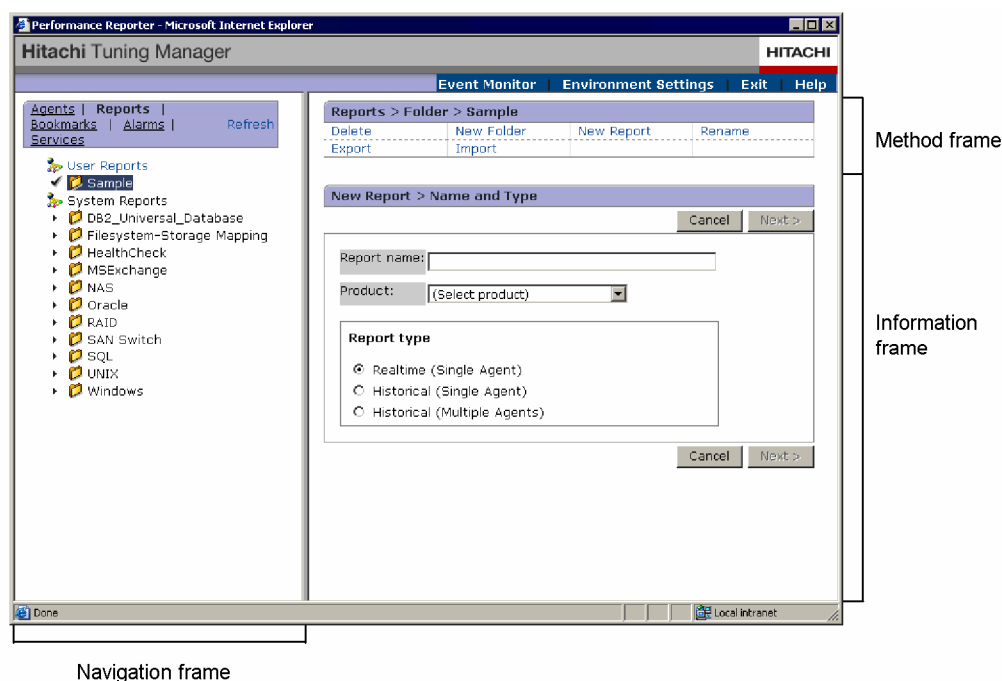


Figure 5-2 Report Wizard Window

The following list describes the items displayed in each frame.

Navigation Frame

- The **Refresh** link updates the displayed information.
- The **User Reports** (👤) area displays a tree of the user-created folders and reports. You can create folders and reports within **User Reports**.
- The **System Reports** (👤) area displays a tree of the folders and reports for the solution set.
- The *name-of-directory-containing-report* (📁) displays the names of the report folders, in alphabetical order. When you select a folder, a list of the associated reports is displayed.
- The *report-name*(📄) displays a list of reports.

Method Frame

- The **Delete** link deletes the folder.
- The **New Folder** link defines a new folder.
- The **New Report** link defines a new report. When you choose this, the Report Wizard is displayed in the Information frame.
- The **Rename** link changes the name of the folder.

Information frame

The window displayed in the Information frame differs, depending on the method selected and contents specified. For information, see the explanation for each definition.

Defining a Report Folder

To define a new folder in which reports are stored:

1. In the Navigation frame of the main window, select the **Reports** link.
2. Click **User Reports** or a folder within in which you want to store reports.
3. In the Method frame, choose the **New Folder** method. The **New Folder** window is displayed in the Information frame.
4. In **New name of the folder**, enter the name of the folder. For example, to create a new folder named **Htmprsvr**, enter the information in Figure 5-3.
5. Click **OK**. The defined folder is added.

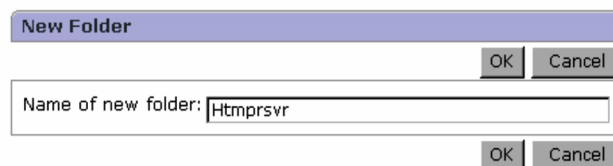


Figure 5-3 Example of a Setting in the New Folder Window

Starting the Report Wizard

You can use the Report Wizard to define reports. To start the Report Wizard:

1. In the Navigation frame of the main window, select the **Reports** link. The report tree is displayed.
2. In the report tree, click the folder in which you want to store the defined report. The clicked folder is selected.
3. In the Method frame, choose the **New Report** method. The New Report > Name and Type window is displayed in the Information frame.

Defining the Name and Type of a Report

To define the name and type of the report:

1. Set the information about the report name and type, in the New Report > Name and Type window. For example, when using Agent for Platform (Windows) and the version 4.0 data model to define a real-time report of the processes with the ten highest CPU usage ratios, specify settings as shown in Figure 5-4.
2. Click **Next >**. The New Report > Field window is displayed.

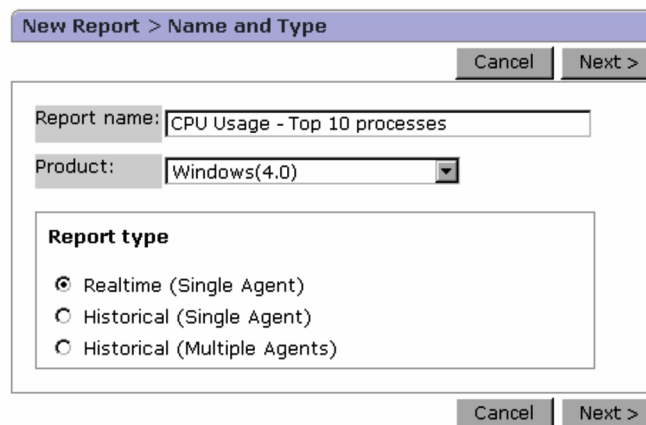


Figure 5-4 Example of Settings for the New Report > Name and Type Window

Following are descriptions of the window's elements:

Report Name

Specify the report name. Values specified can be from 1 to 64 characters.

Product

Select the type of Agent (product) for setting up the report.

The number displayed in the parentheses at the end of the product name indicates the data model version. Select a data model version that matches the data model version of the Agent that uses the report definition.

Note that, if Agents of the same type exist and their data model versions differ, we recommend that you select the oldest data model version.

To check the data model version of an Agent:

- a. In the Agent tree of the Navigation frame, click the Agent to display in the report.
- b. In the Method frame, click **Properties**. The Service Properties window is displayed.
- c. In this window, click the Agent. The data model version is displayed at the bottom of the Information frame.

Report Type

Select the type of the report. **Realtime (Single Agent)** is selected by default. The selectable items are as follows:

- **Realtime (Single Agent)**
 - Select this to display a real-time report of performance data by a single Agent.
- **Historical (Single Agent)**
 - Select this to display a historical report of performance data accumulated by a single Agent.
- **Historical (Multiple Agents)**
 - Select this to display in one window a historical report of performance data accumulated by multiple Agents. When this report is to be created, you cannot select multi-row records (multi-instance records) in the New Report > Field window.

Next >

The New Report > Field window is displayed. You can click this when both **Report name** and **Product** are specified.

Finish

The settings are saved, and the New Report > Name and Type window closes. You can click this only when **Report name** and **Product** are specified and the New Report > Field window has changed to the New Report > Name and Type window.

Defining the Fields Displayed in a Report

You define the fields displayed in the report using the New Report > Field window. The records and fields defined here differ, depending on each Agent. For information about the records and fields for each Agent, refer to the *Hitachi Tuning Manager Hardware Reports Reference*, *Hitachi Tuning Manager Operating System Reports Reference*, or the *Hitachi Tuning Manager Application Reports Reference*.

To define the fields in the report:

1. In the **Record** of the New Report > Field window, select the records that you want to display. The fields for the records selected in **All fields** are displayed.

For example, in Agent for Platform (Windows), to define a real-time report of the processes with the ten highest CPU usage ratios, set the following three fields for the Process Detail (PD) record:

- **PID** (ID_PROCESS)
- **Program** (INSTANCE)
- **CPU %** (PCT_PROCESSOR_TIME)

Figure 5-5 shows an example of settings for the New Report > Field window.

2. In **All fields**, click the fields you want to display in the report. You may select multiple fields simultaneously.
3. Click . The fields selected in **All fields** are displayed in **Selected fields**. You can clear any unwanted fields by selecting the fields in **Selected fields**, and then clicking .
4. Click **Next >**. The New Report > Filter window is displayed.

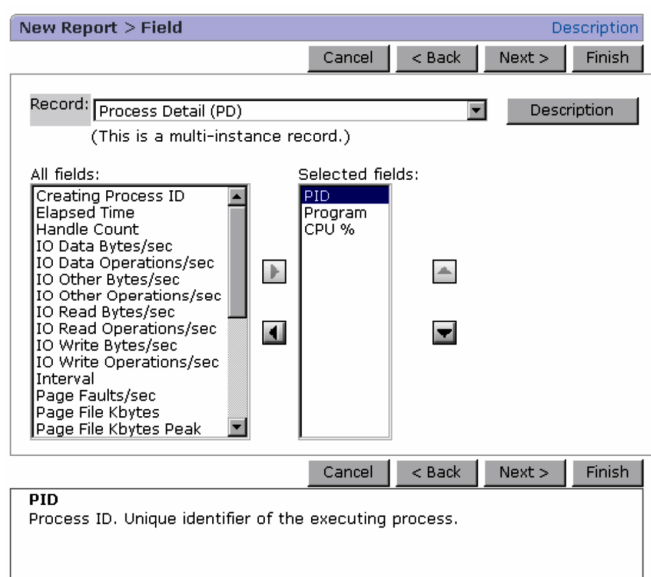


Figure 5-5 Example of Settings for the New Report > Field Window

Following are descriptions of the window's elements:

Record

Select the records that you want to report.

Below **Record**, the record type (single-row record or multi-row record) is displayed. Single-row record refers to a single-instance record, and multi-row record refers to multi-instance records.

If **Historical (Multiple Agents)** is selected for **Report type** in the New Report > Name and Type window, only a single-row record can be selected in **Record**.

Description button

Displays a description of the record belonging to the product defined in the report, in the Record Description window. You can only click this when the description file for the product defined in the report is set up.

All Fields

Displays a list of fields for the selected record. You can use the **Shift** key or **Ctrl** key to select multiple fields.

This is blank by default.



Adds the fields selected in **All fields** to **Selected fields**.



Clears the fields selected in **Selected fields**.

Selected Fields

Displays a list of the fields selected to be displayed in the report. This is blank by default.



Shifts the field selected in **Selected fields** to the field above it.



Shifts the field selected in **Selected fields** to the field below it.

< Back

The New Report > Name and Type window is displayed.

Next >

The New Report > Filter window is displayed. You can click this when **Selected fields** contains a field.

Finish

The settings are saved, and the New Report > Field window closes. You can click this when **Selected fields** contains a field.

Defining the Display Conditions for Fields in a Report

You can define display conditions for fields in the report using the New Report > Filter window. This definition is optional. If unnecessary fields are displayed in the report, you can specify this definition to limit them. You can also specify filter conditions using multiple condition expressions.

To define display conditions:

1. Specify the information necessary to define the condition expression. For example, in Agent for Platform (Windows), to define a real-time report of the processes with the 10 highest CPU usage ratios, set the following conditions as filters for the Process Detail (PD) record:
 - When the value of the **PID** (ID_PROCESS) field is not 0:
Figure 5-6 shows an example of a setting for the New Report > Filter window.
2. Click **Next >**.
 - If **Realtime (Single Agent)** is selected for **Report type** in the New Report > Name and Type window, The New Report > Indication Settings (Real-time) window is displayed. Proceed to [Defining Information Displayed in Reports](#).
 - If **Historical (Single Agent)** or **Historical (Multiple Agents)** is selected for **Report type** in the New Report > Name and Type window, The New Report > Indication Settings (Historical) window is displayed. Proceed to [Defining Information Displayed in Historical Reports](#).

The screenshot shows the 'New Report > Filter' dialog box. At the top, there is a title bar with 'New Report > Filter' and a 'Description' tab. Below the title bar are buttons for 'Cancel', '< Back', 'Next >', and 'Finish'. The main area contains a 'Field:' dropdown menu with 'PID' selected. Below it is a 'Condition:' dropdown menu with '<>' selected. A 'Value:' text box contains '0', and to its right is the word 'Integer'. Below the text box is a checkbox labeled 'Specify when displayed'. Further down are radio buttons for 'AND' (selected) and 'OR', followed by 'Add' and 'Update' buttons. Below these are radio buttons for 'Simple' (selected) and 'Complex'. A list box contains the expression 'PID <> "0"'. To the right of the list box are buttons for 'AND <=> OR', 'Edit', 'Delete', and 'Delete All'. At the bottom are buttons for 'Cancel', '< Back', 'Next >', and 'Finish'.

Figure 5-6 Example of a Setting for the New Report > Filter Window

Following are descriptions of the window's elements:

Field

Select the field to be filtered. By default, no field is selected.

Condition

Select the operator that you want to apply to the field. This is blank by default.

Table 5-1 lists the values that can be selected.

Table 5-1 Field Operators

Value	Description
=	The value for Field and the value for Value are the same.
<	The value for Field is less than the value for Value .
<=	The value for Field is less than or equal to the value for Value .
>	The value for Field is greater than the value for Value .
>=	The value for Field is greater than or equal to the value for Value .
<>	The value for Field and the value for Value are different.



Note: For a character string field, the values are evaluated in ascending order of the ASCII code. These are case sensitive.

Value

Specify the value by which the condition expression is evaluated. This is blank by default.

The specifiable format is shown to the right of **Value**. The specifiable values vary by the field. If **Specify when displayed** is selected, you do not need to specify anything.

Specify when displayed

Select this to specify or change the value for the condition expression when the report is displayed. By default, this is not selected.

AND

Select this to use an **AND** operator to add the condition expression specified for **Field**, **Condition**, **Value**, and **Specify when displayed**, to the condition expression displayed in **Conditional expression**.

OR

Select this to use an **OR** operator to add the condition expression specified for **Field**, **Condition**, **Value**, and **Specify when displayed**, to the condition expression displayed in **Conditional expression**.

Add

Uses an **AND** or **OR** operator to add the condition expression specified for **Field, Condition, Value**, and **Specify when displayed**, to the condition expression displayed in **Conditional expression**. When you specify the first condition expression, the condition expression is set without adding an **AND** or **OR** condition.

Update

Replaces the condition expression selected in **Conditional expression** with the condition expression specified for **Field, Condition, Value**, and **Specify when displayed**. You can select this when **Field, Condition, Value**, and **Specify when displayed** have been specified.

Conditional Expression

Displays a list of created condition expressions. This is blank by default.

Simple

Select this when selecting only one condition expression. This is selected by default or when only one condition expression exists.

Complex

Select this to select all condition expressions combined with **AND** and **OR** operators.

AND<-->OR

Toggles the operator of the condition expression selected in **Conditional expression** between **AND** and **OR**.

Delete

Deletes the condition expression selected in **Conditional expression**. If multiple condition expressions are selected, a confirmation message box is displayed.

Delete All

Deletes all condition expressions for **Conditional expression**.

Edit

Specifies the condition expression selected in **Conditional expression** for the **Field, Condition, Value**, and **Specify when displayed** fields, making it editable.

< Back

The New Report > Field window is displayed.

Next >

- If **Realtime (Single Agent)** is selected for **Report type** in the New Report > Name and Type window:
The New Report > Indication Settings (Realtime) window is displayed.
 - If **Historical (Single Agent)** or **Historical (Multiple Agents)** is selected for **Report type** in the New Report > Name and Type window:
The New Report > Indication Settings (Historical) window is displayed.
- Even when no condition expression is specified for **Conditional expression**, the next screen is displayed. In this case, the condition expression is blank.

Finish

The condition expression specified for **Conditional expression** is saved, and the New Report > Filter window closes. When no condition expression is specified for **Conditional expression**, the report is saved as a report without a condition expression, and then the New Report > Filter window closes.

Defining Information Displayed in Reports

If you select **Realtime (Single Agent)** for **Report type** in the New Report > Name and Type window, perform the procedure described in [Defining Information Displayed in Real-time Reports](#) to define the information displayed in reports.

If you select **Historical (Single Agent)** or **Historical (Multiple Agents)** for **Report type** in the New Report > Name and Type window, perform the procedure described in [Defining Information Displayed in Historical Reports](#) to define the information displayed in reports.

Defining Information Displayed in Real-time Reports

The information displayed in a real-time report is defined in the New Report > Indication Settings (Realtime) window. If **Realtime (Single Agent)** is selected for **Report type** in the New Report > Name and Type window, perform the following procedure to define information displayed in a real-time report.

1. Set the items necessary to define display information. For example, in Agent for Platform (Windows), to define a real-time report of the processes with the ten highest CPU usage ratios, set the following conditions for the display information of the real-time report for the Process Detail (PD) record:
 - Display the data in the report as delta values (the differences from the previous data).
 - For the interval by which to automatically update the report display, set the initial value to 60 seconds, and the minimum value to 30 seconds.
 - Display the top ten results, based on the **CPU %** (PCT_PROCESSOR_TIME) field.

Figure 5-7 shows an example of a setting.

2. Click **Next >**. The New Report > Components window is displayed.

New Report > Indication Settings(Realtime) Description

Cancel < Back Next > Finish

☐ Specify when displayed
☒ Indicate delta value

Refresh interval

☐ Do not refresh automatically
Initial value: 60 seconds (Minimum value <= N <= 3,600)
Minimum value: 30 seconds (10 <= N <= 3,600)

Display by ranking

Field: CPU %
Display number: 10 (1 <= N <= 100)
☐ In descending order

Cancel < Back Next > Finish

Figure 5-7 Example of a Setting for the New Report > Indication Settings (Realtime) Window

Following are descriptions of the window's elements:

Specify when displayed

Select this to set the display settings when the report is displayed. By default, this is not selected.

Indicate delta value

Select this to display the data in the report as delta values. The data displayed in the report differs depending on the following conditions:

- Whether **Indicate delta value** is selected
- Whether delta values are collected for the record fields displayed in the report
- Whether delta values are collected for the record fields depends on each of the fields. For information about whether delta values are collected into delta values and record fields, see the chapter on records (listing the fields for each record) in the *Hitachi Tuning Manager Hardware Reports Reference*, *Hitachi Tuning Manager Operating System Reports Reference*, or the *Hitachi Tuning Manager Application Reports Reference*.

Table 5-2 explains the correspondence between the conditions and the values displayed in the report. In this table, "Yes" means delta values are collected and "No" means they are not.

Table 5-2 Conditions and Corresponding Values in Reports

Indication Delta Value Setting	Delta Attribute of the Field	Displayed Value
Checked	Yes	The difference between the performance data collected previously and that collected recently
Checked	No	The most recently collected value
Not checked	Yes	The cumulative value since collection of performance data started
Not checked	No	The most recently collected value

Legend:

Yes: The collected values are delta values.

No: The collected values are not delta values.

Refresh interval

Set the auto-refresh interval for when a real-time report is displayed in the report window.

Do not refresh automatically

Select this to prevent the report display from automatically refreshing. By default, this is not selected.

Initial value

Specify the refresh interval (in seconds), for when the report display is automatically refreshed. The default is 60.

The values that can be specified are integers from the value specified for **Minimum value** to 3,600.

Minimum value

Specify the minimum value (in seconds) for the refresh interval after which the report window is displayed. You can change the updating interval when a report is displayed, in **Refresh interval** of the **Show Options** tab.

The default is 60.

The values that can be specified are integers from 10 to 3,600.

Display by ranking

Set this to display reports with the data of a certain field in ascending or descending order, when multi-row records (multi-instance records) are displayed in reports.

Field

Select the field by which the display is determined and the number of higher and lower items of data to display as set in **Display number**. You can select from **Field** when multi-row records (multi-instance records) are selected for **Record**, in the New Report > Field window.

Display number

Specify the number of higher and lower items of data to display. This can be specified when a field is selected for **Field**. The default is 10. The values that can be specified are from 1 to 100.

In descending order

Select this to display data in descending order, when multi-row records (multi-instance records) are displayed in reports. This can be specified when a field is selected for **Field**.

< Back

The New Report > Filter window is displayed.

Next >

The New Report > Components window is displayed.

Finish

The settings are saved, and the New Report > Indication Settings (Realtime) window closes.

Defining Information Displayed in Historical Reports

The information displayed in a historical report is defined in the New Report > Indication Settings (Historical) window. With **Historical (Single Agent)** or **Historical (Multiple Agents)** selected for **Report type**, perform the following procedure to define information displayed in a historical report.



Note: Keep the following in mind when changing the time settings for the Agent host:

- When the time of the Agent host is set ahead of the current time, performance information is not displayed for the period from the time of the change until the new time that is set.
- When the time of the Agent host is set behind the current time, performance information for the period from the new time that is set until the time of the change is displayed as the overwritten data.

-
1. Set the items necessary to define display information. For example, in Agent for Platform (Windows), to define a report summarizing CPU usage for each minute over the last hour, set the following conditions for the display information of the historical report for the System Overview (PI) record:
 - Specify the collection period for performance data when the report is displayed.
 - Set the report display interval to 1 hour.
 - Display only the data from the time at which the **User CPU %** (PCT_TOTAL_USER_TIME) field reached its daily maximum.
 - Set the maximum number of records displayed in a report to 1,440.

Figure 5-8 shows an example of a setting for the New Report > Indication Settings (Historical) window.

2. Click **Next >**. The New Report > Components window is displayed.

Figure 5-8 Example of a Setting for the New Report > Indication Settings (Historical) Window

The following text describes the items displayed in the New Report > Indication Settings (Historical) window.

Specify when displayed

Select this to set the display settings when the report is displayed. By default, this is not selected.

Settings for the report display period

Set the display period for the report.

Date range

Select the period for which performance data to be displayed in the report is to be collected. **Specify when displayed** is selected by default. Table 5-3 lists the periods that can be selected for performance data collection.

Table 5-3 Performance Data Collection Periods

Value	Description
Specify when displayed	Specify the period when the report is displayed.
Within the past hour	Display data collected in the past hour.
Within the past 24 hours	Display data collected in the past 24 hours.
Within the past 7 days	Display data collected in the past 7 days.
Within the past month	Display data collected in the past month.
Within the past year	Display data collected in the past year.

Report interval

Select the display interval for the report.

You can select an interval for **Report interval** when a PI type record is selected for **Record** in the New Report > Field window.

Table 5-4 lists the intervals that can be selected for the display interval of the report.

Table 5-4 Report Display Intervals

Value	Description
Minute	Displays the report at one-minute intervals.
Hour	Displays the report at one-hour intervals.
Day	Displays the report at one-day intervals.
Week	Displays the report at one-week intervals.
Month	Displays the report at one-month intervals.
Year	Displays the report at one-year intervals.

Peak time

Set this to display the report only for the time at which the value of a field reached its daily maximum.

Field

Select the field for which the peak time is to be set, when only data from the time at which a certain field reaches its maximum value is displayed.

Field can be selected when a single-row record (single-instance record) is selected for **Record** in the New Report > Field window, and **Hour** is selected for **Report interval**. The default is **(none)**.

Maximum number of records

Specify the maximum number of records to display in the report. The values that can be specified are from 1 to 2,147,483,647. However, the limit value when you initially display a report is either `maxFetchCount`, which is specified in `config.xml`, or the value of **Maximum number of records**, whichever is smaller.

The default value for `maxFetchCount` in `config.xml` is 1,440. If you want to display more than 1,440 records, you need to change the `maxFetchCount` value. For details about `config.xml`, see the *Hitachi Tuning Manager Server Administration Guide*.

If the specified value is too large, Performance Reporter fails to display a report, and then the `KAVJS3001-E` message is output. In this case, use the `jpcrpt` command to output the report. For details on the `jpcrpt` command, see the *Hitachi Tuning Manager Command Line Interface Guide*.

< Back

The New Report > Filter window is displayed.

Next >

The New Report > Components window is displayed.

Finish

The settings are saved, and the New Report > Indication Settings (Historical) window closes.

Defining the Display Format

You can select from one of the following three display formats for a report. You can also display in multiple display formats.

- **Table**
- **List**
- **Graph**

When **Graph** is selected as the display format, you can select a type of graph. You can also define a drilldown report when you want to display a detailed report for a record.

Defining the Display Format for a Report

The display format of a report is defined in the New Report > Components window.

To define the display format for a report:

1. Set the information necessary to define the display format of the report.

For example, in Agent for Platform (Windows), to define a real-time report of the processes with the ten highest CPU usage ratios, perform the following settings to display as a table a report for each field in the Process Detail (PD) record, and display as a graph a report of the **CPU %** (PCT_PROCESSOR_TIME) field.

Figure 5-9 shows an example of a setting for the New Report > Components window.



Note: You can also select multiple items from among **Table**, **List**, and **Graph** as the display format.

2. Click **Next >**. When at least one **Graph** is selected in the New Report > Components window, the New Report > Graph window is displayed. When no **Graph** is selected in the New Report > Components window, the New Report > Drilldown window is displayed.

Select the style in which each field is to be displayed

Fields	Table	List	Graph	Display name
PID	☒	☐	☐	
Program	☒	☐	N/A	
CPU %	☒	☐	☒	

Display key

Field:

☐ In descending order

Figure 5-9 Example of a Setting for the New Report > Components Window

Following are descriptions of the window's elements:

Fields

Displays the field selected in the New Report > Field window.

Table

Select this to display the selected fields in tabular format, with rows and columns. By default, this is selected.

List

Select this to display the selected fields in list format, with one line for each field, from the top of the list. By default, this is not selected.

Graph

Select this to display the selected fields in graph format. If the **Fields** attribute is not a number, this format cannot be used (**N/A** is displayed instead). By default, this is not selected.

Display name

Specify the name to be used as the title and column names for a table, list, or graph. This name must be within 24 characters. This is blank by default. If nothing is specified, the name of the field is displayed in the report.

Display key

Select the field to be used as a key.

Field

Select the field to be used as a sort key when you want to display data sorted in the multi-row records (multi-instance records). You cannot specify **Field** in the following cases:

- If **Historical (Multiple Agents)** is selected for **Report type** in the New Report > Name and Type window
- If **Line, Area, or Stacked area** is selected for **Graph types** in the New Report > Graph window

The default is **(none)**.

In descending order

Select this when you want to display data sorted in the multi-row records (multi-instance records) in descending order. By default, this is not selected. **In descending order** cannot be set in the following cases:

- If **Historical (Multiple Agents)** is selected for **Report type** in the New Report > Name and Type window
- If **Line, Area, or Stacked area** is selected for **Graph types** in the New Report > Graph window

By default, this item is not selected.

< Back

- If **Realtime (Single Agent)** is selected for **Report type** in the New Report > Name and Type window, the New Report > Indication Settings (Realtime) window is displayed.
- If **Historical (Single Agent)** or **Historical (Multiple Agents)** is selected for **Report type** in the New Report > Name and Type window, the New Report > Indication Settings (Historical) window is displayed.

Next >

- If **Graph** is selected in the New Report > Components window, the New Report > Graph window is displayed.
- If **Graph** is not selected in the New Report > Components window, the New Report > Drilldown window is displayed.

Finish

The settings are saved, and the New Report > Components window closes.

Defining a Graph Type

If **Graph** is selected in the New Report > Components window, define the graph types and display format in the New Report > Graph window.

To define the graph types and display format:

1. Specify the information necessary to define the graph type and display format.

For example, in Agent for Platform (Windows), to define a real-time report of the processes with the ten highest CPU usage ratios, perform settings with the following conditions to display a graph with a report of the **CPU %** (PCT_PROCESSOR_TIME) field of the Process Detail (PD) record:

- Set the y-axis to the value of the **CPU %** (PCT_PROCESSOR_TIME) field.
- Set the x-axis to the name of the **Program** (INSTANCE) field, the value of the part within the parenthesis of the **PID** (ID_PROCESS) field.
- Set the type of graph to a bar graph.

Figure 5-10 shows an example of a setting for the New Report > Graph window.

2. Click **Next >**. The New Report > Drilldown window is displayed.



Note: When not defining a drilldown report, you can click **Finish** to complete the report settings.

Figure 5-10 Example of a Setting for the New Report > Graph Window

Following are descriptions of the window's elements:

Graph types

Select the graph types. In the following cases, you cannot select graphs of the **Line**, **Area**, or **Stacked area** type:

- If **Historical (Multiple Agents)** is selected for **Report type** in the New Report > Name and Type window, and multiple settings are set for **Graph** in the New Report > Components window.
- If the **Display key** item is selected in the New Report > Components window.
- If a multi-row record (multi-instance record) is selected for **Record** in the New Report > Field window, and multiple items are selected for **Graph** in the New Report > Components window.

The **Column** is selected by default. The following text describes the selection items.

Column

A column graph

Stacked column

A column graph in which multiple items are stacked

Bar

A bar graph

Stacked bar

A bar graph in which multiple items are stacked

Pie

A pie graph

Line

A line graph

Area

A graph expressing change in data as a surface

Stacked area

An area graph in which multiple items are stacked

Show areas of missing data

If data is missing, for reasons such as the fact that the Agent was not running, you can select the **Show areas of missing data** check box to prevent this data from being displayed. You can select this check box when **Graph types** is set to **Line**, **Area**, or **Stacked area**, and the following conditions apply:

- **Historical (Multiple Agents)** is selected for **Report type** in the New Report > Name and Type window, and an item is selected for **Graph** in the New Report > Components window.
- A multi-row record (multi-instance record) is selected for **Record** in the New Report > Field window, and an item is selected for **Graph** with no item selected for **Display key** in the New Report > Components window.

Series direction

Specify whether to display data by row (record) or by column (field). **By row** is selected by default.

By row

Select this to display data by row (record).

By column

Select this to display data by column (field).

Axis labels

Set the x-axis and the y-axis of the report.

X-axis

Specify the string for the title of the x-axis. This is blank by default.

You can specify a value from 0 to 40 characters.

Y-axis

Specify the string for the title of the y-axis. This is blank by default. You can specify a value from 0 to 40 characters.

Data label

Set the field to be used for the display label of each record.

Data label1

Set the field to be used for the display label of each record.

(none) is selected by default.

You cannot set **Data label1** when one of the following conditions is satisfied:

- **Realtime (Single Agent)** or **Historical (Single Agent)** is selected for **Report type** in the New Report > Name and Type window.
- A single-row record (single-instance record) is selected for **Record** in the New Report > Field window.
- **Line**, **Area**, or **Stacked area** is selected for **Graph types** in the New Report > Graph window.

The fields displayed differ depending on the type of report.

- When **Realtime (Single Agent)** is selected for **Report type** in the New Report > Name and Type window:
The **Record Time** field is displayed. When a multi-row record (multi-instance record) is selected, the key field is also displayed.
- When **Historical (Single Agent)** is selected for **Report type** in the New Report > Name and Type window:
The **Date and Time** field is displayed. When a multi-row record (multi-instance record) is selected, the key field is also displayed.
- When **Historical (Multiple Agents)** is selected for **Report type** in the New Report > Name and Type window, the **Date and Time**, **Agent Host**, and **Agent Instance** fields are displayed.

Data label2

Set the field to be used for the display label of each record.

(none) is selected by default.

You cannot set **Data label2** when one of the following conditions are satisfied:

- **Data label1** is not set.
- **Realtime (Single Agent)** or **Historical (Single Agent)** is selected for **Report type** in the New Report > Name and Type window.
- A single-row record (single-instance record) is selected for **Record** in the New Report > Field window.
- **Line**, **Area**, or **Stacked area** is selected for **Graph types** in the New Report > Graph window.

The conditions for the fields displayed are the same as those for **Data label1**.

The value selected for **Data label2** is displayed in parentheses following the value selected for **Data label1**.

< Back

The New Report > Components window is displayed.

Next >

The New Report > Drilldown window is displayed.

Finish

The settings are saved, and the New Report > Graph window closes.

Defining a Drilldown Report

To display a detailed report of data displayed in a report, define a drilldown report in the New Report > Drilldown window.

Figure 5-11 shows the New Report > Drilldown window.

New Report > Drilldown Description

Cancel < Back Finish

Report drilldown

Report:

Add Change Delete

Field drilldown

Bind Unbind Edit Expression

Select	Field	Report	Conditional expression
☐	PID	(No report is selected.)	
☐	Program	(No report is selected.)	
☒	CPU %	CPU Usage - Top 10 Processes	PID <> "0"

Cancel < Back Finish

Figure 5-11 New Report > Drilldown Window

Following are descriptions of the window's elements:

Report drilldown

Sets up a drilldown report (report level).

Report

Displays a list of specified drilldown reports (report level). This is blank by default.

Add

Adds a drilldown report to **Report**.

Change

Changes a drilldown report in **Report**.

Delete

Deletes the drilldown report selected in **Report**.

Field drilldown

Sets up a drilldown report (field level).

Bind

Sets up a drilldown report (field level) for the field selected in **Select**.

Unbind

Deletes the drilldown report (field level) for the field selected in **Select**. When the report is deleted, **(No report is selected.)** is displayed in **Report**.

Edit Expression

Modifies the filter condition expression for when the drilldown report is displayed. This can only be selected when a drilldown report (field level) is set up for the field selected in **Select**.

Select

Select the desired **Field**. By default, this is not selected.

Field

The fields for which a drilldown report (field level) can be set up are displayed.

Report

The drilldown reports (field level) set up for the fields are displayed.

Conditional expression

Displays a list of created condition expressions.

< Back

- When coming from the New Report > Components window:
The New Report > Components window is displayed.
- When coming from the New Report > Graph window:
The New Report > Graph window is displayed.

Finish

The settings are saved, and the New Report > Drilldown window closes.

There are two kinds of drilldown reports: report-level reports and field-level reports. Report-level reports display reports related to a certain report, while field-level reports display reports related to each field displayed in a certain report. The following text describes how to define each type of drilldown report.

Defining a Drilldown Report (report level)

To define a drilldown report (report level):

1. Click **Add** in the New Report > Drilldown window. The New Report > Drilldown > Select Report window is displayed.
2. Select the drilldown report to link to the report. In this step, choose **Process Detail** as an example.

Figure 5-12 shows an example of a setting for the New Report > Drilldown > Select Report window.

3. Click **OK**. The drilldown report selected for **Report** is displayed in the New Report > Drilldown window.
4. Click **Finish**. The New Report > Drilldown window closes, and the settings for the report are completed.

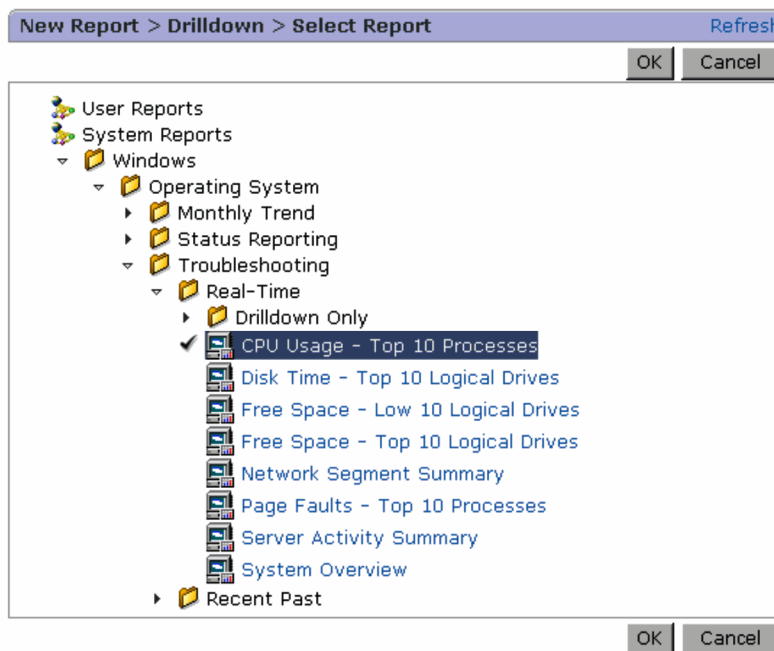


Figure 5-12 Example of the New Report > Drilldown > Select Report Window

Following are descriptions of the window's elements:

User Reports

Displays a tree of the user-created folders and reports.

System Reports

Displays a tree of the folders and reports for the solution set.

 name-of-directory-containing-report

Displays the names of the report folders, in alphabetical order. When you select a folder, a list of the reports contained to the selected folder is displayed.

 report-name

Displays a list of reports.

Refresh

Updates the displayed information.

Defining a drilldown report (field level)

To define a drilldown report (field level):

1. From **Field**, choose the field to which you want to link the drilldown report.
2. Click **Select**.
3. Click **Bind**. The New Report > Drilldown > Select Report window is displayed.
4. Select the drilldown report to link to the field.
5. Click **OK**. The drilldown report is displayed, as selected for **Report** in **Field drilldown** in the New Report > Drilldown window.
6. To set the condition expression when the selected field is displayed, click **Edit Expression**. The New Report > Drilldown > Edit Conditional Expression for Drilldown window is displayed.
7. Set the condition expression for the drilldown report; for example, to display a drilldown report showing the processes that have a higher CPU usage rate than those displayed in the report window, set the condition expression as follows:

CPU % > CPU %

The CPU % on the left indicates the CPU usage rate shown in the drilldown report. This is specified in the first **Field** of the New Report > Drilldown > Edit Conditional Expression for Drilldown window.

The CPU % on the right indicates the CPU usage rate shown in the report window based on which the drilldown report is displayed. This is specified in **Field**, in **Select value or field**.

Figure 5-13 shows an example of a setting for the New Report > Drilldown > Edit Conditional Expression for Drilldown window.

8. Click **OK**. The condition expression is set, and the New Report > Drilldown window is displayed. The set condition expression is displayed in **Conditional expression**, in **Field drilldown**.
9. Click **Finish**. The New Report > Drilldown window closes, and the settings for the report are completed.

Figure 5-13 Example of a Setting for the New Report > Drilldown > Edit Conditional Expression for Drilldown Window

Following are descriptions of the window's elements. For information about items that are not explained here, see the New Report > Filter window description in [Defining the Display Conditions for Fields in a Report](#).

Description button

A description of the fields belonging to the record of the drilldown report is displayed in the Field Description window. You can only click this button if the description file for the product defined in the report is set up.

Select value or field

Value check box

Select this to specify a value in the **Value** text box. By default, this is selected.

Value text box

Specify a value for comparison. This is blank by default. The specifiable values vary by field. If **Specify when displayed** is selected, you do not need to specify anything.

Specify when displayed

Select this to specify the value of the condition expression when the report is displayed. By default, this is not selected.

Field check box

Select this to specify or change the field for comparison.

By default, this is not selected.

Field drop-down list

Select the field for comparison. Nothing is selected by default. The fields displayed differ depending on the type of report.

- When **Realtime (Single Agent)** is selected for **Report type** in the New Report > Name and Type window, the **Record Time** field is displayed. When a multi-row record (multi-instance record) is selected, the **Instance** field is also displayed.
- When **Historical (Single Agent)** is selected for **Report type** in the New Report > Name and Type window, the **Date and Time** field is displayed. When a multi-row record (multi-instance record) is selected, the **Instance** field is also displayed.
- When **Historical (Multiple Agents)** is selected for **Report type** in the New Report > Name and Type window, the **Date and Time**, **Agent Host**, and **Agent Instance** fields are displayed.



Note: When using Internet Explorer 6.0, do not use the mouse wheel to select an item from the drop-down list. If you use the wheel to scroll the drop-down list, an error (KAVJS0037-E) might occur. If this error occurs, restart the wizard.

Defining Reports

This section uses an example in Windows to explain how to perform the following operations for reports:

- [Operations Performed for a Report Folder](#)
Under **User Reports**, in which user-defined reports are stored, you can add a folder, change the name of a folder, or delete a folder. To organize user-defined reports, perform these operations.
- [Operations Performed for a Report Definition](#)
For user-defined reports, you can copy a report, edit a report definition, change the name of a report, or delete a report. By performing these operations, you can copy and edit a report definition to create another report definition, or you can change or delete the name of a report to organize reports.

Operations Performed for a Report Folder

You can perform the following folder operations in the **Reports** link of the main window of Performance Reporter:

- [Adding a Report Folder](#)
- [Changing the Name of a Report Folder](#)
- [Deleting a Report Folder](#)
- [Copying a Report between Folders](#)

Adding a Report Folder

To add a folder:

1. In the Navigation frame of the main window, select the **Reports** link.
2. From the report tree, click **User Reports** or the folders within in which you want to add a folder. The folder is selected.
3. In the Method frame, choose the **New Folder** method. The New Folder window is displayed in the Information frame (see Figure 5-14).
4. In **New name of the folder**, enter a name using from 1 to 64 characters.
5. Click **OK**. A folder is added to the report tree in the Navigation frame.

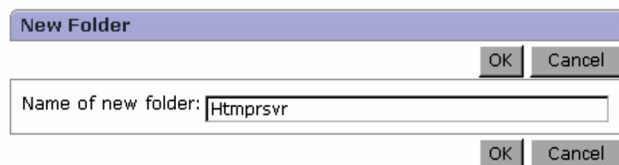


Figure 5-14 **New Folder Window**

Changing the Name of a Report Folder

To change the name of a folder:

1. In the Navigation frame of the main window, select the **Reports** link. The report tree is displayed.
2. In the report tree, click the folder, within **User Reports**, whose name you want to change. The clicked folder is selected.
3. In the Method frame, select the **Rename** method. The Rename window is displayed in the Information frame (see Figure 5-15). The current name of the folder is displayed in **Current name of the folder**.
4. Enter the new name of the folder in **New name of the folder** by using from 1 to 64 characters.
5. Click **OK**. The name of the selected folder is changed.

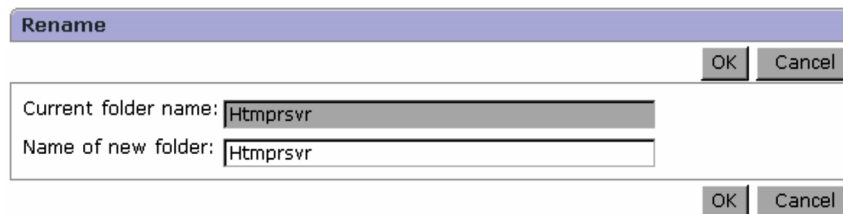


Figure 5-15 **Rename Window**

Deleting a Report Folder

Deleting a folder also deletes the folders and reports contained in that folder. To delete a folder:

1. In the Navigation frame of the main window, select the **Reports** link. The report tree is displayed.
2. In the report tree, click the folder, within **User Reports**, that you want to delete. The clicked folder is selected.
3. In the Method frame, select the **Delete** method. A message box confirming deletion is displayed in the Information frame.
4. To delete the selected folder, click **OK**. The selected folder is deleted.

Copying a Report between Folders

To copy a report between folders:

1. In the Navigation frame of the main window, select the **Reports** link. The report tree is displayed.
2. In the report tree, click the folder containing the report you want to copy. The clicked folder is selected, and the list of the reports and folders within is displayed.
3. In the list of reports, click the report you want to copy. The clicked report is selected.
4. In the Method frame, choose the **Copy** method. The Copy window is displayed in the Information frame, as is the report tree of the copy destination (see Figure 5-16).
5. Click the folder of the copy destination or **User Reports**. The clicked folder of the copy destination or **User Reports** is selected.
6. Click **OK**. The selected report is copied to the copy destination folder or to **User Reports**.

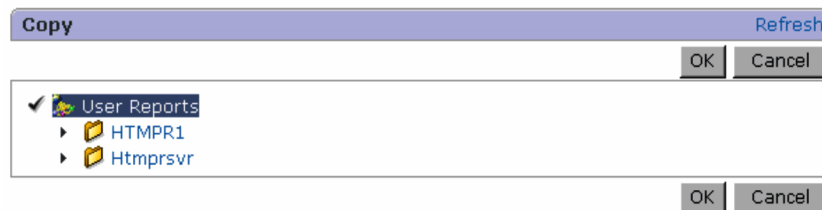


Figure 5-16 Copy Window

Operations Performed for a Report Definition

You can perform the following operations for report definitions in the **Reports** link of the main window of Performance Reporter:

- [Editing a Report Definition](#)
- [Changing the Name of a Report](#)



Note: For information about copying a report, see [Copying a Report between Folders](#). For information about deleting custom reports, see [Deleting a User-defined Report](#).

Editing a Report Definition

To edit a report definition:

1. In the Navigation frame of the main window, select the **Reports** link. The report tree is displayed.
2. In the report tree, click the folder containing the report whose definition you want to edit. The clicked folder is selected, and a list of the reports and folders within is displayed.
3. In the list of reports, click the report whose definition you want to edit. The clicked report is selected.
4. In the Method frame, choose the **Edit** method. The Report Wizard is displayed in the Information frame. For information about the items displayed in each window of the Report Wizard, see [Defining Reports Using the Report Wizard](#).
5. Once the settings are complete, click **Finish**. The changes will take effect.



Note: When re-selecting **Report type** or **Record**, you will need to specify the settings again for filter conditions, display settings, and other items.

Changing the Name of a Report

To change the name of a report:

1. In the Navigation frame of the main window, select the **Reports** link. The report tree is displayed.
2. In the report tree, click the folder, in **User Reports**, containing the report whose name you want to change. The clicked folder is selected, and a list of the reports and folders within is displayed.
3. In the list of reports, click the report whose name you want to change. The report is selected.
4. In the Method frame, select the **Rename** method. The Rename window is displayed in the Information frame (see Figure 5-17). The current name of the report is displayed in **Current name of the report**.
5. Enter the new name for the report in **New name of the report** by using from 1 to 64 characters.
6. Click **OK**. The name of the selected report is changed.

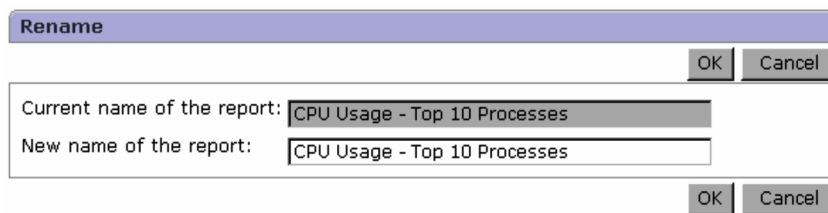


Figure 5-17 Rename Window

Exporting a Report Definition

In Performance Reporter, you can export report definitions by using the `jpcrdef output` command or the GUI. You can use the exported data as a backup of report definitions. For details on the `jpcrdef output` command, see the *Hitachi Tuning Manager Command Line Interface Guide*.

To export one or more report definitions by using the GUI:

1. In the Navigation frame of the main window of Performance Reporter, choose the **Reports** link.
2. Select the target to be exported in the Reports tree of the Navigation frame. The report is exported according to the selected target as follows:
 - When the root **User Reports** is selected: Folders under **User Reports** and all reports are exported.
 - When a folder is selected: The selected folder and reports under it are exported.
 - When a report is selected: The selected report is exported.

3. In the Method frame, select the **Export** method.
The File Download window appears.
4. Click the **Save** button.
The Save As window appears.
5. Specify the export destination and file name.
The target selected in step 2 is output to the specified file.
6. Click the **Save** button.
The target selected in step 2 is exported.

Importing a Report Definition

To import report definitions in Performance Reporter, you must use the definition information exported by the `jpcrdef output` command or the GUI as an import source. You can import a report definition by using either the `jpcrdef create` command or the GUI.

If you export server data whose report definition is already defined, and then import it to another server, you can omit the report definition. For details on the `jpcrdef create` command, see the *Hitachi Tuning Manager Command Line Interface Guide*.

To import a report definition by using the GUI:

1. In the Navigation frame of the main window of Performance Reporter, choose the **Reports** link.
The Reports window appears.
2. In the Method frame, select the **Import** method.
The Import window appears.
3. Click the **Browse** button of **Import file name**.
The Choose File window appears.
4. Select the definition file of the report to be imported.
The root, folders, and reports described in the selected definition file are imported.
5. Click the **OK** button.
A message box to confirm your replacement appears.
6. If you want to replace the report, click the **OK** button in the message box.
The report is imported.

Notes on Creating Reports

The following provides cautionary notes on creating reports:

- About the setting for the refresh interval
If you want to display multiple real-time reports simultaneously, set the refresh interval so that the automatic refreshes of the respective windows are not performed at the same time.
- Usage difference between real-time and historical reports
If you want to view trends in long-time performance data, use a historical report instead of displaying a real-time report for a long time.
- Reports with a lot of displayed data
For reports with a lot of displayed data (for example, a report of **Process Detail Interval** (PD_PDI) records), use data filters or a ranking to display only the necessary data.

Displaying Reports

Drilldown reports are called from parent reports. You can define whether to display drilldown reports in the Report Wizard. You can also use a command to define whether to display drilldown reports.

Displaying Primary Reports

You can display reports from the main window or from the Report Tree Selection window.

To display reports from the main window:

1. In the Navigation frame of the main window, choose the **Agents** link. The Agent tree is displayed.
2. Select one or more Agents in the Performance Reporter main window.
3. Choose **Display Report** in the Method frame of the main window. A list of reports for the selected Agent is displayed in the Information frame.
4. Choose the report to be displayed from the list of report names. Reports are displayed on the **Reports** tab.

To display reports from the Report Tree Selection window, select the name of the report you want to display from the list of reports. The report is displayed on the **Reports** tab of the report window.

If you specify a single-Agent historical report or a single-Agent real-time report for multiple Agents, a separate report window is displayed for each Agent. If you specify a multi-Agent historical report for multiple Agents, one report window with data for all Agents is displayed.



Note: With a historical report for multiple Agents, if data could be acquired for at least one Agent, but not for one or more of the other Agents, no error is displayed. If data could not be acquired for any Agents, an error is displayed.

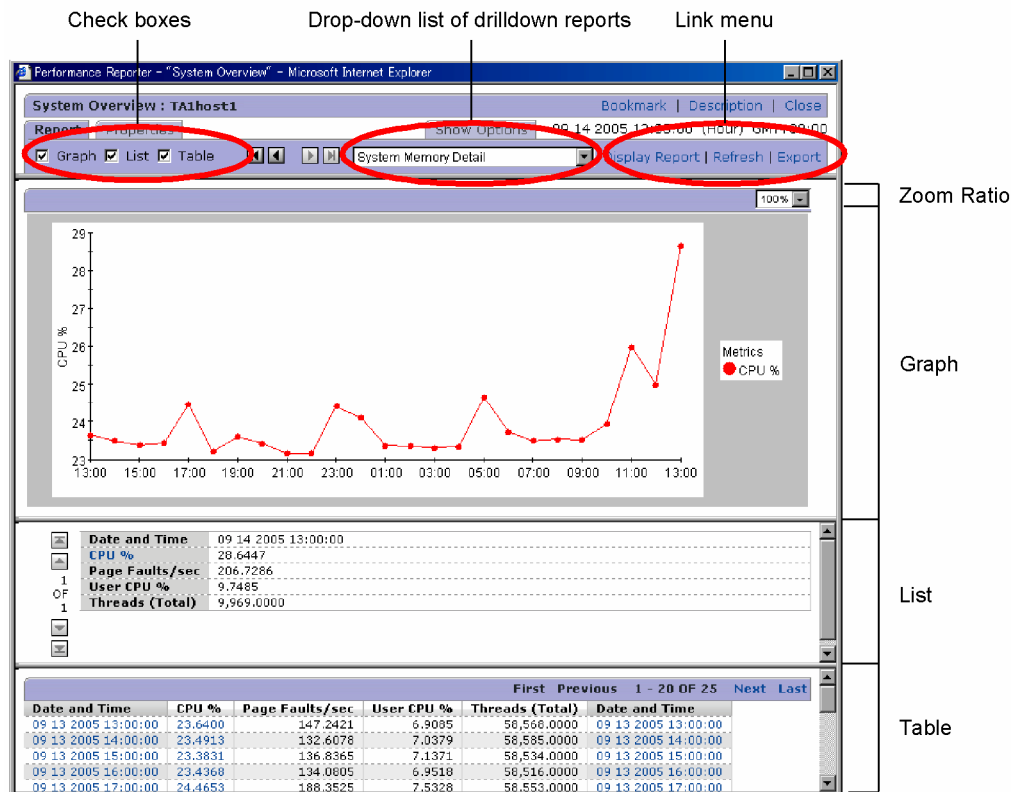


Figure 5-18 Report Window, Report Tab Sample Report

The following describes each display item:

Common menu

Baseline

Baseline appears in the upper right corner of the Display Reports window only for reports that are not real-time reports, reports without graphs, or reports specified with the display key fields.

Baseline refers to a report that covers a period in the past that has been saved as a reference. A baseline can be overlaid on a combination report.

Choosing this item displays a separate window for registering a baseline. When you select a combination bookmark, enter the name of the baseline in the entry field and click the **OK** button. The baseline is added under the selected combination bookmark. When you select a baseline, the entry field does not appear (the message "Click **OK** to update the selected baseline" appears). When you click the **OK** button, the selected baseline is updated.

Bookmark

Displays the Bookmark Registration window.

Description

Displays a description of the records and fields in a separate window.

Close

Closes the report window.

Check boxes**Graph**

Select this box to display data in a graph. This box cannot be selected if graph data is not set in the report definition or if there is no applicable data.

List

Select this box to display data in a list. This box cannot be selected if list data is not set in the report definition or if there is no applicable data.

Table

Select this box to display data in a table. This box cannot be selected if table data is not set in the report definition or if there is no applicable data.



Displays the first data or data group.



Displays the previous data or data group.



Displays the next data or data group.



Displays the last data or data group.

Drop-down list of drilldown reports

This is a list of drilldown reports. This list is displayed if drilldown reports (report level) are defined.

Link menu**Display Report**

Displays the drilldown reports selected in the drop-down list of drilldown reports. This is not displayed if there are no drilldown reports.

Refresh

Fetches the data again and refreshes it.

Stop

Stops auto-refresh for a real-time report.

Export

Exports the data acquired for displaying the report to a CSV text file. This item is not displayed for automatically refreshed real-time reports. To display this item in this case, first choose **Stop** to stop automatic refreshing. Choosing **Export** displays a dialog box for downloading files.

Print

Displays the Print Reports window as a new window.

This item is not displayed in a real-time report that is being updated automatically. If you want to display this item during an automatic update, choose the **Stop** menu item to stop the update.

Graph

A graph is displayed. For an overview of graphs, see the description of graphs in [About Report Display Formats](#).

Zoom Ratio

Enlarges the displayed graph. You can select **100%**, **200%**, **400%**, **600%**, or **800%** for the zoom percentage. You can enlarge the display to the optimal size when the data of multiple Agents or multiple instances is acquired and the size of the displayed graph is small.

List

A list is displayed. If you click the name of a field displayed as a link, a drilldown report (field level) is displayed. For details on the list, see the description of the list in [About Report Display Formats](#).

Table 5-5 describes the buttons that are used for moving pages in the list.

Table 5-5 Navigation Buttons for the List Page

Button	Description
	Displays the first Agent or instance data in the same data group.
	Displays the previous Agent or instance data in the same data group.
	Displays the next Agent or instance data in the same data group.
	Displays the last Agent or instance data in the same data group.

Table

A table is displayed. If you click the name of a field displayed as a link, a drilldown report (field level) will be displayed. For an overview of tables, see the description of tables in [Tables](#).

Table 5-6 describes the links that are used for moving pages in the table.

Table 5-6 Navigation Links for the Table Page

Link	Description
First	Displays the first page.
Previous	Displays the previous page.
Next	Displays the next page.
Last	Displays the last page.

Displaying Drilldown Reports

Drilldown reports are called from a parent report. You can display drilldown reports by defining them to be displayed in the Report Wizard (see [Defining Reports Using the Report Wizard](#)). You can also use the command line to define a report definition specifying that drilldown reports are to be displayed. Each drilldown report is displayed in a separate window from the parent report. When you close the parent window, all drilldown report windows also close.

Display Conditions for Drilldown Reports

Drilldown reports are displayed after being filtered by the following types of display conditions:

- Filtering conditions defined in a parent report for displaying drilldown reports
- Filtering conditions defined in a drilldown report for displaying that report
- The Show Options conditions defined as **Specify when displayed** (SPECIFY_WHEN_DISPLAYED) in the drilldown report

There is an order of priority for the first two conditions. Even if the filtering conditions for a drilldown report are defined with fixed values, the filtering conditions specified for its parent report take precedence.

Displaying a Drilldown Report by Specifying a Report Name

When there are report-level drilldown reports, the report window's menu bar displays their names in a drop-down list, together with the **Display Report** link. To display a report-level drilldown report, select the name of the desired drilldown report from the drop-down list, and then click the **Display Report** link. Note that the reports registered in bookmarks and combination bookmarks appear as drilldown reports in the drop-down list. If there are no report-level drilldown reports, the menu bar does not contain the list or the **Display Report** link. The number of drilldown reports will depend on the parent report.

Figure 5-19 shows the menu bar in the report window when a list is displayed.

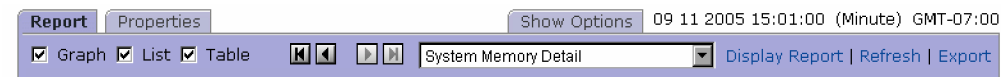


Figure 5-19 Menu Bar in the Report Window

When a parent report, which is the drilldown source, is a historical report (multi-Agent), the drilldown reports of all the Agents inherited from the parent report are displayed. Also, when multiple Agents are selected and the drilldown report is a historical report (single Agent) or real-time report (single Agent), a dialog box is displayed to confirm that multiple report windows should be opened.

Displaying a drilldown report (field level) from a report area

You can display a related drilldown report (field level) by clicking a graph, list, or table in the report window.

The following sections describe how to display a drilldown report (field level) from a graph, list, or table.

Displaying a drilldown report (field level) from a graph area

You can click a graph area to display a drilldown report (field level). To do so, you need to define the drilldown report to be displayed in the report definition. Figure 5-20 shows an example of a graph area from which a drilldown report can be displayed.

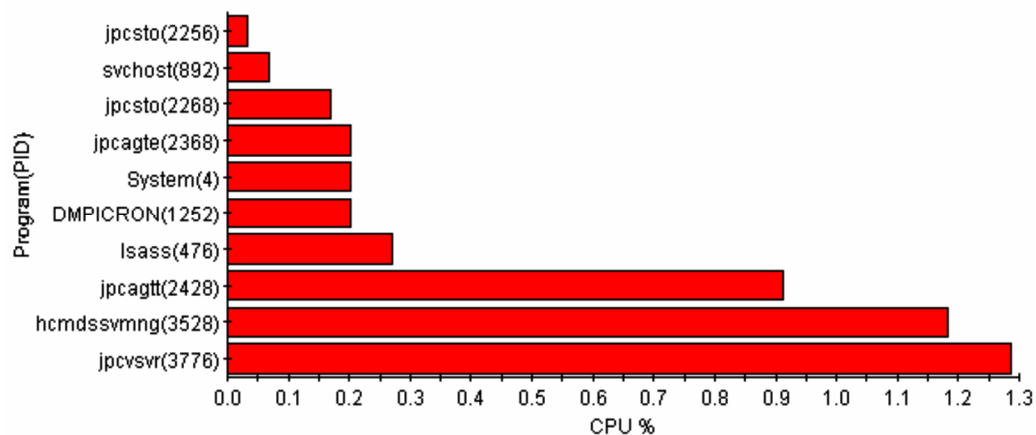


Figure 5-20 Example of a Graph Area from which a Drilldown Report Can Be Displayed

Displaying a drilldown report (field level) from a list of item names

Click the desired item name in the list to display a field-level drilldown report. The listed item names that can be selected are displayed as links. Figure 5-21 shows an example of list item names displayed as links.

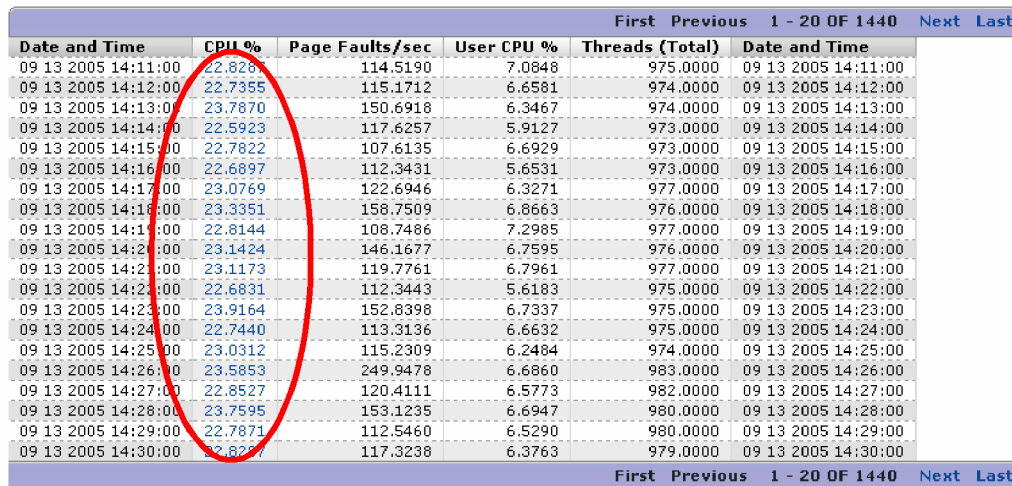


Date and Time	09/14/2005 13:00:00
CPU %	28.0355
Page Faults/sec	188.8508
User CPU %	9.4552
Threads (Total)	14,941.0000

Figure 5-21 Example of List Names Displayed as Links

Displaying a drilldown report (field level) from a table

Click the desired table value to display a field-level drilldown report. The table values that can be selected are displayed as links. Figure 5-22 shows an example of table values displayed as links.



First Previous 1 - 20 OF 1440 Next Last					
Date and Time	CPU %	Page Faults/sec	User CPU %	Threads (Total)	Date and Time
09/13/2005 14:11:00	22.6261	114.5190	7.0848	975.0000	09/13/2005 14:11:00
09/13/2005 14:12:00	22.7355	115.1712	6.6581	974.0000	09/13/2005 14:12:00
09/13/2005 14:13:00	23.7870	150.6918	6.3467	974.0000	09/13/2005 14:13:00
09/13/2005 14:14:00	22.5923	117.6257	5.9127	973.0000	09/13/2005 14:14:00
09/13/2005 14:15:00	22.7822	107.6135	6.6929	973.0000	09/13/2005 14:15:00
09/13/2005 14:16:00	22.6897	112.3431	5.6531	973.0000	09/13/2005 14:16:00
09/13/2005 14:17:00	23.0769	122.6946	6.3271	977.0000	09/13/2005 14:17:00
09/13/2005 14:18:00	23.3351	158.7509	6.8663	976.0000	09/13/2005 14:18:00
09/13/2005 14:19:00	22.8144	108.7486	7.2985	977.0000	09/13/2005 14:19:00
09/13/2005 14:20:00	23.1424	146.1677	6.7595	976.0000	09/13/2005 14:20:00
09/13/2005 14:21:00	23.1173	119.7761	6.7961	977.0000	09/13/2005 14:21:00
09/13/2005 14:22:00	22.6831	112.3443	5.6183	975.0000	09/13/2005 14:22:00
09/13/2005 14:23:00	23.9164	152.8398	6.7337	975.0000	09/13/2005 14:23:00
09/13/2005 14:24:00	22.7440	113.3136	6.6632	975.0000	09/13/2005 14:24:00
09/13/2005 14:25:00	23.0312	115.2309	6.2484	974.0000	09/13/2005 14:25:00
09/13/2005 14:26:00	23.5853	249.9478	6.6860	983.0000	09/13/2005 14:26:00
09/13/2005 14:27:00	22.8527	120.4111	6.5773	982.0000	09/13/2005 14:27:00
09/13/2005 14:28:00	23.7595	153.1235	6.6947	980.0000	09/13/2005 14:28:00
09/13/2005 14:29:00	22.7871	112.5460	6.5290	980.0000	09/13/2005 14:29:00
09/13/2005 14:30:00	22.6267	117.3238	6.3763	979.0000	09/13/2005 14:30:00
First Previous 1 - 20 OF 1440 Next Last					

Figure 5-22 Example of Table Values Displayed as Links

When drilldown reports are displayed from the report area, the information that is inherited by drilldown reports from a parent report depends on the combination of report types. Table 5-7 and Table 5-8 describe which information is inherited from a parent report for a drill-down report.

Table 5-7 Information Inherited from Multi-Agent Parent Report

Drilldown Report	Multiple Agents (Historical Report Only)	Single Agent
Data collection interval	Date and Time information of the clicked data line	For a historical report, same as that to the left. For a real-time report, no information is inherited.
Agent type	The Agents of the clicked graph area, list page, or table line	The Agent selected after displaying the parent report
Report interval	Report definition of the drilldown report. When changed by the Specify-when-displayed setting: the value after the change was made.	For a historical report, same as that to the left. For a real-time report, no information is inherited.



Note: Information is only inherited by a drilldown report if the parent is a report. Information is not inherited by reports registered in bookmarks or combination bookmarks.

Table 5-8 Information Inherited from Single-Agent Parent Report

Drilldown Report	Multiple Agents (Historical Report Only)	Single Agent
Data collection interval	Date and Time information of the clicked data line	For a historical report, same as that to the left. For a real-time report, no information is inherited.
Agent type	The Agent selected when displaying the parent report (see Note)	
Report interval	Report definition of the drilldown report. When changed by the Specify-when-displayed setting: the value after the change was made	For a historical report, same as that to the left. For a real-time report, no information is inherited.



Note: Information is only inherited by a drilldown report if the parent is a report. Information is not inherited by reports registered in bookmarks or combination bookmarks.

For single-Agent drilldown reports, instances are not inherited automatically even when the parent report and drilldown report are both multiple instances. If the instances must be inherited, it is necessary to set field values by specifying the field values in the drilldown condition settings of the parent report.

Displaying a drilldown report (automatic settings) by specifying a time item

When a table is displayed, the **Date and Time** field, or the **Record Time** field for a real time report, is added as the first and last columns. If the report target record is a PI type record and the data collection interval is defined in units other than minutes, it is possible to select a **Date and Time** field or **Record Time** field time, and then display an appropriate, automatically set up drilldown report. Figure 5-23 shows an example of the **Date and Time** field displayed as a link.

First Previous 1 - 20 OF 25 Next Last					
Date and Time	CPU %	Page Faults/sec	User CPU %	Threads (Total)	Date and Time
09 13 2005 13:00:00	23.6400	147.2421	6.9085	58,568.0000	09 13 2005 13:00:00
09 13 2005 14:00:00	23.4913	132.6078	7.0379	58,585.0000	09 13 2005 14:00:00
09 13 2005 15:00:00	23.3831	136.8365	7.1371	58,534.0000	09 13 2005 15:00:00
09 13 2005 16:00:00	23.4368	134.0805	6.9518	58,516.0000	09 13 2005 16:00:00
09 13 2005 17:00:00	24.4653	188.3525	7.5328	58,553.0000	09 13 2005 17:00:00
09 13 2005 18:00:00	23.2069	129.0676	7.3878	58,512.0000	09 13 2005 18:00:00
09 13 2005 19:00:00	23.6053	135.6857	7.4533	58,713.0000	09 13 2005 19:00:00
09 13 2005 20:00:00	23.4190	133.4091	7.5510	58,571.0000	09 13 2005 20:00:00
09 13 2005 21:00:00	23.1610	131.1478	7.3745	58,573.0000	09 13 2005 21:00:00
09 13 2005 22:00:00	23.1638	128.0626	7.2881	58,487.0000	09 13 2005 22:00:00
09 13 2005 23:00:00	24.4029	189.1710	7.1696	58,557.0000	09 13 2005 23:00:00
09 14 2005 00:00:00	24.0909	146.6974	7.0384	58,546.0000	09 14 2005 00:00:00
09 14 2005 01:00:00	23.3601	126.9726	6.5523	58,462.0000	09 14 2005 01:00:00
09 14 2005 02:00:00	23.3421	126.9453	6.6524	58,466.0000	09 14 2005 02:00:00
09 14 2005 03:00:00	23.3088	126.7266	6.8675	58,481.0000	09 14 2005 03:00:00
09 14 2005 04:00:00	23.3353	126.4405	6.6257	58,458.0000	09 14 2005 04:00:00
09 14 2005 05:00:00	24.6578	191.2363	6.9384	58,551.0000	09 14 2005 05:00:00
09 14 2005 06:00:00	23.7232	141.4132	6.7985	59,023.0000	09 14 2005 06:00:00
09 14 2005 07:00:00	23.4943	129.4535	6.5944	59,134.0000	09 14 2005 07:00:00
09 14 2005 08:00:00	23.5299	128.8303	6.8769	59,130.0000	09 14 2005 08:00:00
First Previous 1 - 20 OF 25 Next Last					

Figure 5-23 Example of a Table Displaying the Date and Time Field as a Link

An automatically set up drilldown report displayed by specifying a time item has the same report definition as the parent report; however, **Start time** in the drilldown report will have the value of the selected **Date and Time** or **Record Time**, and **Report Interval** will be one level more detailed than the parent report. For example, **Report Interval** of the drilldown report will be **Minute** if **Report Interval** of the parent report is **Hour**.



Note: Only historical reports can display drilldown reports from time items.

Displaying Report Properties

You can display report definition information in two ways:

- Click the **Properties** tab in the report window.
- Perform the following procedure:
 - a. In the Navigation frame of the main window, choose the **Reports** link.
 - b. Select a report definition in the Navigation frame, and then select the **Properties** method in the Method frame.

By displaying the properties, you can check the filter conditions for the report, the data collection period for the report, the auto-refresh interval for data displayed in the report, and other information.

Figure 5-24 shows the report window's **Properties** tab.

The screenshot shows a web browser window titled "Performance Reporter - 'System Overview' - Microsoft Internet Explorer". The main content area is titled "System Overview : TA1htmp:svr" and has tabs for "Report" and "Properties", with "Properties" being the active tab. A "Show Options" button is in the top right. Below the tabs are several links: "Name and type", "Field", "Indication settings(Historical)", "Components", "Graph", and "Drilldown".

The "Properties" tab is divided into three main sections:

- Name and type:** Contains three text boxes: "Report name:" with the value "System Overview", "Product:" with the value "Windows(3.0)", and "Report type:" with the value "Historical (Single Agent)".
- Field:** Contains a "Record:" box with the value "System Overview(P1)". Below it are two lists of fields. The "All fields:" list includes: "% Committed Bytes in Use", "% Registry Quota in Use", "% Total DPC Time", "% Total Interrupt Time", and "Active CPUs". The "Selected fields:" list includes: "Date and Time", "CPU %", "Page Faults/sec", "Transition Faults/sec", and "Bytes Total/sec".
- Indication settings(Historical):** Contains a checkbox labeled "Specify when displayed" which is checked. Below it is a "Maximum number of records:" box with the value "1,440". At the bottom is a section titled "Settings for the report display period" with a "Date range:" box containing the text "Within the past hour".

Figure 5-24 Report Window, Sample Properties Tab

Following are descriptions of the window's elements:

Name and type

Report name

Displays the report name (up to 64 characters).

Product

Displays the product name. When multiple Agent data model versions correspond to one product in the used environment, *product-name (version)* is displayed in **Product**.

Report type

Displays the report type (**Realtime (Single Agent)**, **Historical (Single Agent)**, or **Historical (Multiple Agents)**).

Field

Record

Displays a selected record ID.

All fields

Displays all fields belonging to the selected record.

Selected fields

Displays the fields that were selected for display in the report.

Conditional expression

Conditional expression

Displays the condition expressions set as a filter for the report over multiple lines as a list. If no filter is set, then nothing is displayed. If setting conditions are unified, parentheses "()" express the unification.

Indication settings (Historical)

Specify when displayed

This check box determines whether the **Show Options** tab is to be displayed when the report is displayed.

Maximum number of records

Displays the maximum record count that has been set.

Settings for the report display period

- **Date range**

Displays the display target interval for the report. The **Date range** values are **Specify when displayed**, **Within the past hour**, **Within the past 24 hours**, **Within the past 7 days**, **Within the past month**, and **Within the past year**.

- **Report interval**

Displays the data collection interval for the report. The **Report interval** values are **Minute**, **Hour**, **Day**, **Week**, **Month**, and **Year**.

Peak time

- **Field**

Displays the contents of the peak time collection field when this characteristic is set. If this characteristic is not set, **(none)** is displayed.

Indication settings (Realtime)

Specify when displayed

This check box determines whether the **Show Options** tab is to be displayed when the report is displayed.

Indicate delta value

This check box determines whether delta values are displayed or not.

Do not refresh automatically

This check box determines whether a real-time report is auto-refreshed or not.

If selected: Do not perform auto-refresh.

If not selected: Perform auto-refresh.

Initial value

Displays the auto-refresh interval (in seconds) for data displayed in the report.

Minimum value

Displays the minimum auto-refresh interval (in seconds) for data displayed in the report.

Display by ranking

- **Field**

Displays the name of the field set. This is displayed when there are multiple instances for the data used for the report. If this characteristic is not set, **(none)** is displayed.

- **Display number**

Displays the number of ranked items to display. This is displayed when there are multiple instances for the data used for the report. If this component is not set, the display is blank.

In descending order

Displays whether the ranking display is in descending order. This is displayed when there are multiple instances for the data used for the report.

If selected: Descending order

If not selected: Ascending order

Components

Fields

Displays the field names.

Table

This check box determines whether the applicable field is to be displayed in a table.

List

This check box determines whether the applicable field is to be displayed in a list.

Graph

This check box determines whether the applicable field is to be displayed in a graph. If a field is not a numeric field, **N/A** is displayed because it is not possible to display its data in a graph.

Display name

If this component is set, the display name setting is displayed. Up to 24 characters can be displayed. If this component is not set, the display is blank.

Display key

- **Field**

If this component is set, the value of the display key field is displayed. If this component is not set, **(none)** is displayed.

- **In descending order**

This component sets whether the displayed key values are to be listed in descending or ascending order:

If selected: Descending order

If not selected: Ascending order

Graph

Graph types

Displays the type of graph to be displayed as one of the following:

- **Column**
- **Stacked column**
- **Bar**
- **Stacked bar**
- **Pie**
- **Line**
- **Area**
- **Stacked area**

Series direction

Displays whether the graph series is by row or by column as one of the following:

- **By row**
- **By column**

Show areas of missing data

This check box displays whether to show a break in a graph when displaying a part with missing data.

- If checked: Display the data with a break in the graph.
- If not checked: Do not display a break in the graph.

Axis labels

- **X-axis**

If this property is set, the X-axis label is displayed. A maximum of 40 characters can be displayed. If this property is not set, the display is blank.

- **Y-axis**

If this property is set, the Y-axis label is displayed. A maximum of 40 characters can be displayed. If this property is not set, the display is blank.

Data label

- **Data label 1**

If this property is set, data label 1 is displayed. Up to 40 characters can be displayed. If this property is not set, **(none)** is displayed.

- **Data label 2**

If this property is set, data label 2 is displayed. Up to 40 characters can be displayed. If this property is not set, **(none)** is displayed.

Drilldown

Report drilldown

- **Report**

A drilldown report whose report name is specified is displayed. This report can display up to 64 characters. If this report is not set, a blank space is displayed.

Field drilldown

- **Field**

This report displays field names related to field-level drilldown reports.

- **Report**

This report displays report names related to field-level drilldown reports. If this property is not set, **(No report is selected.)** is displayed.

- **Conditional expression**

This report displays display conditions related to field-level drilldown reports. The condition expressions set as a filter for the report are displayed over multiple lines in a list. If no filter is set, nothing is displayed. If setting conditions are unified, parentheses "()" express the unification.



Note:

- The property display contents are the report definition information, not the display setting information. Therefore, even if the display conditions are changed from the **Show Options** tab, the property display information does not change.
 - For details about how to define reports by using the Report Wizard, see [Defining Reports Using the Report Wizard](#). For details about defining reports using commands, see [Defining Reports Using Commands](#) and the *Hitachi Tuning Manager Command Line Interface Guide*.
-

Checking the Properties (Definitions) of Combination Bookmarks

You can check the definition of a combination bookmark on the **Properties** page of the corresponding report window. You cannot check the definitions of the registered reports themselves.

To check the definition of a combination bookmark:

1. In a Performance Reporter window, display the window for the report whose properties (definition) you want to check. For details, see [Generating Reports](#).
2. In the report window, choose the **Properties** tab.

The definition information for the combination bookmark appears on the **Properties** page.



Note: The information displayed on the **Properties** page is the definition information for the combination bookmark, not the display settings. For this reason, changing the display conditions on the **Show Options** page does not affect the information displayed on the **Properties** page.

Setting and Changing Report Display Conditions

You can set or change report display conditions at either of two times: when you define a report, and when you display a report.

- **Display conditions specified when you define a report**

The display conditions set when you define a report are registered permanently in the Performance Reporter system. These conditions are not affected by such operations as opening and closing windows, or starting and shutting down the system. Such display conditions are registered permanently until the `jpcrdef delete` command is used to delete them from the Performance Reporter system.

- **Display conditions specified when you display a report**

You can use the **Show Options** tab in the report window to specify or change the display conditions for a report. These settings are effective only while a report is being displayed in that window. Once you close that window or open another window, the display conditions revert to the defaults for that report.

If you want to set the report display conditions every time reports are displayed, we recommend that you specify that the **Show Options** tab be displayed when defining reports.

Display Conditions Specified When You Define a Report

You can define the report display conditions by using the Report Wizard or by using the `jpcrdef create` command.

The display conditions set when you define a report are registered permanently in the Performance Reporter system. These conditions are not affected by such operations as opening and closing windows, or starting and shutting down the system. Such display conditions are registered permanently until the `jpcrdef delete` command is used to delete them from the Performance Reporter system.

For information about using the Report Wizard to define a report, see [Defining Reports Using the Report Wizard](#). For details about the commands, see the *Hitachi Tuning Manager Command Line Interface Guide*.

Display Conditions Specified When You Display a Report

This section describes how to specify display conditions when you display a report.

Display Conditions Specified When You Display a Report

You can use the **Show Options** tab in the report window to specify or change the display conditions for a report. These settings are effective only while a report is being displayed in that window. Once you close that window or open another window, the display conditions revert to the defaults for that report.

For the **Show Options** tab to be displayed at the time of initial display of a report window, make an appropriate specification in the definition of the report. The actual window that will be displayed depends on the combination of report definition items.

There are three types of **Show Options** tabs, depending on the report definition information:

Specifying a data collection period or collection interval

To set the data collection period or collection interval, set the report definition as follows:

- To define a report using the Report Wizard: Select **Specify when displayed** in **Indication Settings**, or select **Specify when displayed** for **Date range** in **Indication Settings** for the historical report.
- To define a report using commands: In the parameter file to be specified as an argument of the `jpcrdef create` command, edit the following parameter:

Set the `specify-when-displayed` attribute to `TRUE` or omit the `date-range` subelement when you set the `indication-settings` parameter.

If you specify these settings for a report definition, the **Show Options** tab is displayed, as shown in Figure 5-25.

System Overview : TA1gonzul
Description | Close
Show Options

OK

Display report settings

Settings for the report display period

Date range:
Within the past hour
Start time:
11 06 2008 15:53
dd MM yyyy HH:mm
End time:
11 06 2008 16:53
dd MM yyyy HH:mm
Report interval:
Minute

Maximum number of records:
1440
(1 <= N <= 1,440)

Peak time

This option displays the records corresponding to the peak time within each day based upon the selected field.
Field:
(none)

OK

Area for setting the data collection period and interval, etc.

Figure 5-25 Setting the Data Collection Period or Collection Interval with a Report Displayed

The **Settings for the report display period** box allows you to set the parameters for a report.

Date range

Select the target period from **Specify when displayed**, **Within the past hour**, **Within the past 24 hours**, **Within the past 7 days**, **Within the past month**, and **Within the past year**.

Start time

Specify the start time in the specified format. If you enter a value, the **Date range** setting will change to **Specify when displayed**. The display format specified for **Start time** changes depending on the combination of the date format and the `Report interval` value set in `config.xml`. Table 5-9 lists the display formats.

End time

Specify the end time in the specified format. If you enter a value, the **Date range** setting will change to **Specify when displayed**. The display format specified for **End time** changes depending on the combination of the date format and the `Report interval` value set in `config.xml`. Table 5-9 lists the display formats.

Customizing Reports

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Report interval

Specify the report interval. Available options for a PI type record are: **Minute**, **Hour**, **Day**, **Week**, **Month**, and **Year**. The value of the report interval changes depending on the **Date range** setting.

Specify when displayed becomes **Hour**

Within the past hour becomes **Minute**

Within the past 24 hours becomes **Hour**

Within the past 7 days becomes **Day**

Within the past month becomes **Week**

Within the past year becomes **Month**

Maximum number of records

You can specify the maximum record count in the range from 1 to 1440.

Note that, in the Performance Reporter initialization settings file (`config.xml`), you can specify the maximum record count (`maxFetchCount`) in the range from 1 to 2147483647. If you did so, you can specify the maximum record count in the range you specified in the `config.xml` file.

Peak time

Specify a field name for **Field** if you want to display the report only for the time at which the value of the field reached its daily maximum (the peak time).

Field

From the drop-down list, select a field whose values at the peak time are to be displayed. This item is enabled when the record is a single instance record (single-row record) and the hourly interval (**Hour**) is specified for the display interval of the report (**Report interval**).

If the report is a real-time report, the displayed items are as follows:

Indicate delta value

Select this to display the data in the report as delta values. If you select this item and delta values are collected for the record fields displayed in the report, the differences between the previously collected performance data and that collected recently are displayed.

Refresh interval

Do not refresh automatically

Select this to prevent the report display from automatically refreshing.

Refresh interval

Specify the refresh interval (in seconds), for when the report display is automatically refreshed. The value must be no more than 3,600.

Display by ranking

Set this to display reports with the data of a certain field in ascending or descending order, when multi-row records (multi-instance records) are displayed in reports.

Field

Select the field by which the display of the real-time report is sorted when displaying the number of higher or lower items specified for **Display number**.

Display number

Specify the number of higher or lower data items to display in the range from 1 to 100. This item is enabled only when a field is selected for **Field**.

In descending order

Select this to display data in descending order.

After specifying the necessary settings, click **OK** to display the report.

Table 5-9 Display Formats for Start Time and End Time

Report Interval Value	Date Format [dd MM yyyy]	Date Format [MM dd yyyy]	Date Format [yyyy MM dd]
Minute	[dd MM yyyy HH:mm]	[MM dd yyyy HH:mm]	[yyyy MM dd HH:mm]
Hour	[dd MM yyyy HH:00]	[MM dd yyyy HH:00]	[yyyy MM dd HH:00]
Day	[dd MM yyyy]	[MM dd yyyy]	[yyyy MM dd]
Week	[dd MM yyyy]	[MM dd yyyy]	[yyyy MM dd]
Month	[MM yyyy]	[MM yyyy]	[yyyy MM]
Year	[yyyy]	[yyyy]	[yyyy]

Legend:

dd: Indicates the day.

MM: Indicates the month.

yyyy: Indicates the year.

HH: Indicates the hour.

mm: Indicates the minute.

Specifying data filtering conditions

If you want to specify filtering conditions when the report is displayed, specify the following settings for the report definition:

- To define a report using the Report Wizard:
Select **Specify when displayed** in the **Filter** settings.

- To define a report using commands:

In the parameter file to be specified as an argument of the `jpcrdef create` command, edit the following parameter:

- Specify `TRUE` for the `Specify-when-displayed` attribute of the `record - condition-expression - expression` parameter. The hyphens in this expression indicate the tree when you are defining reports. The description `record - condition-expression` means to specify `condition-expression` for the `record` subelement.

When you specify the above settings for a report definition, the **Show Options** tab is displayed as shown in Figure 5-26.

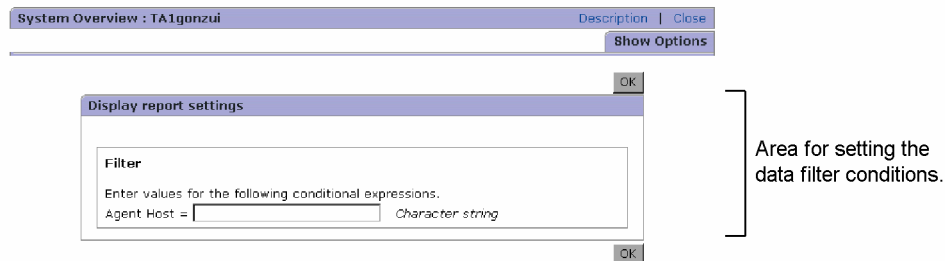


Figure 5-26 Report Window, Show Options Tab, Setting Data Filter Conditions

Specifying the data collection period, collection interval, and data filtering conditions

To set the data collection period, collection interval, and filter conditions, perform the following procedure:

- To define a report using the Report Wizard:
 - Select **Specify when displayed** in **Indication Settings**, or select **Specify when displayed** for **Date range** in **Indication Settings** for the historical report.
 - Select **Specify when displayed** in **Filter**.
- To define a report using commands:

In the parameter file to be specified as an argument of the `jpcrdef create` command, edit the following parameter:

 - Specify `TRUE` for the `specify-when-displayed` attribute of the `indication-settings` parameter. Alternatively, omit the `date-range` subelement of the `indication-settings` parameter.
 - Specify the `record - condition-expression - expression` parameter. Next, specify `TRUE` for the `specify-when-displayed` attribute of the `expression` parameter.

The hyphens in the above expressions indicate the tree when you are defining reports. The description `record - condition-expression` means to specify `condition-expression` for the record subelement.

When you specify these settings for a report definition, the **Show Options** tab is displayed, as shown in Figure 5-27.

Figure 5-27 Report Window, Show Options Tab, Setting Data Collection, Interval or Filters

Specifying the display format of a report

To specify the display format of a report:

1. Display the report window. The Show Options window will be automatically displayed in the report window.
2. Specify items that are required to specify the display settings of reports. The required items are as follows:
 - **Date range:** Select the display interval for the report from the following: **Specify when displayed, Within the past hour, Within the past 24 hours, Within the past 7 days, Within the past month, or Within the past year.**
 - **Start time:** Specify the start time for reports in the specified format. When you enter a value, the **Date range** setting will change to **Specify when displayed**. The display format specified for **Start time** and **End time** changes depending on the combination of the date format and the `Report interval` value specified in the `config.xml` file. Table 5-10 lists the display formats.

- **End time:** Specify the end time for reports in the specified format. When you enter a value, the **Date range** setting will change to **Specify when displayed**. The display format specified for **Start time** and **End time** changes, depending on the combination of the date format and the `Report interval` value specified in the `config.xml` file. Table 5-10 lists the display formats.
- **Report interval:** Specify the interval. Available options for a PI type record are: **Minute**, **Hour**, **Day**, **Week**, **Month**, or **Year**. The value of the report interval changes depending on the **Date range** setting:
 - Specify when displayed** becomes **Hour**
 - Within the past hour** becomes **Minute**
 - Within the past 24 hours** becomes **Hour**
 - Within the past 7 days** becomes **Day**
 - Within the past month** becomes **Week**
 - Within the past year** becomes **Month**
- **Maximum number of records:** Specify the maximum number of records. The value specified for `maxFetchCount` in the `config.xml` file is the upper limit.
- **Field:** Select a field ID from the list. This item can be specified when a record is a single instance record and **Hour** is specified for the **Report interval** setting.
- **Filter:** Specify a condition expression by using integers, decimal values, or character strings of no more than 2,048 bytes.
- **Indicate delta value:** Select this if you want to display delta values for a real-time report. If this is selected and the attribute of the field to be specified does not support delta values, delta values will not be displayed. The obtained values will be displayed.
- **Do not refresh automatically:** Select this if you want to disable auto-refresh for a real-time report. When this is not selected, data is collected automatically from the Agent, and auto-refresh is performed for the real-time report.
- **Refresh interval:** Specify an auto-refresh interval for the real-time report. You can specify a value from the value of **Minimum value** to 3,600. The default value is the value of **Initial value**.
- **Display by ranking**
 - **Field:** From the list, select the field by which the display of the real-time report is sorted.
 - **Display number:** Specify an integer from 1 to 100 for the number of ranked items to display for the real-time report.
- **In descending order:** Select this to display collected data for the real-time report in descending order.



Note: The display format specified for **Start time** and **End time** changes depending on the combination of the date format and the `Report interval` value specified in the `config.xml` file. Table 5-10 lists the display formats.

Table 5-10 Display Formats for Start Time and End Time

Report Interval Value	Date Format [<i>dd MM yyyy</i>]	Date Format [<i>MM dd yyyy</i>]	Date Format [<i>yyyy MM dd</i>]
Minute	[<i>dd MM yyyy HH:mm</i>]	[<i>MM dd yyyy HH:mm</i>]	[<i>yyyy MM dd HH:mm</i>]
Hour	[<i>dd MM yyyy HH:00</i>]	[<i>MM dd yyyy HH:00</i>]	[<i>yyyy MM dd HH:00</i>]
Day	[<i>dd MM yyyy</i>]	[<i>MM dd yyyy</i>]	[<i>yyyy MM dd</i>]
Week	[<i>dd MM yyyy</i>]	[<i>MM dd yyyy</i>]	[<i>yyyy MM dd</i>]
Month	[<i>MM yyyy</i>]	[<i>MM yyyy</i>]	[<i>yyyy MM</i>]
Year	[<i>yyyy</i>]	[<i>yyyy</i>]	[<i>yyyy</i>]

Legend:

dd: Indicates the day.

MM: Indicates the month.

yyyy: Indicates the year.

HH: Indicates the hour.

mm: Indicates the minute.

3. Click the **OK** button. The report window appears.

Changing the Display Format of a Report When the Report Is Displayed

You can change the display format of a report when the report is displayed.

To change the display format:

1. Display the report window.
2. Select the **Show Options** tab in the report window. The Show Options window appears.
3. Specify the settings required to display reports. For the values that must be specified for each item, see [Display Conditions Specified When You Display a Report](#).

Deleting a User-defined Report

To delete a report:

1. In the Navigation frame of the main window, select the **Reports** link. The report tree is displayed.
2. In the report tree, click the folder, in **User Reports**, containing the report you want to delete. The clicked folder is selected, and the list of the reports and folders within is displayed.
3. In the list of reports, click the report you want to delete. The clicked report is selected.
4. In the Method frame, select the **Delete** method. A message box confirming deletion is displayed in the Information frame.
5. To delete the selected report, click **OK**. The selected report is deleted.

Example of Creating a New Report

This section describes how to create a new report by using an example of creating the Average Response Rate of Device File report.

To create the Average Response Rate of Device File report:

1. In the global tasks bar area of the Main Console, click **Go** and then **Performance Reporter**. The main window of Performance Reporter is displayed.
2. In the Navigation frame of the main window, select the **Reports** link. The report tree is displayed.
3. In the Navigation frame of the main window, click **User Reports**.
4. In the Method frame, choose the **New Report** method. The New Report > Name and Type window is displayed in the Information frame.
5. In **Report Name**, enter **Average Response Rate of Device File**. For **Product**, select Windows(5.0).
6. In **Report Type**, select **Historical (Single Agent)**, and then click **Next**. The New Report > Field window is displayed.
7. In **Record**, select **Physical Disk Overview(PI_PHYD)**.
8. In **All fields**, select the following fields: **Date and Time**, **ID**, **Ave Disk Secs/Xfer**, **Ave Disk Secs/Read**, and **Ave Disk Secs/Write**. Click **Next >**. The New Report > Filter window is displayed.
9. Select the field **ID**, = for **Condition**, and **Specify when displayed**. Click **Add**, and then select **AND** and **Simple**. **ID = prompt("")** is displayed in **Conditional expression**. Click **Next >**. The New Report > Indication Settings (Historical) window is displayed.
10. Make sure that **Specify when displayed** is shown for **Date range** and select **Minute** for the **Report interval**.
11. In **Maximum number of records**, specify 1440. Click **Next >**. The New Report > Components window is displayed.
12. Select the **Graph** check box for **Avg Disk Secs/xfer**.
13. In **Display Key**, select **(none)** for **Field**. Click **Next >**. The New Report > Graph window is displayed.
14. Select **Line** for the **Graph type**, and then make sure that **By column** is selected and that **(none)** is shown for both **Data label 1** and **Data label 2**. Click **Finish**. The settings are saved, and the New Report > Graph window closes.
15. In the Navigation frame of the main window, click the **Agents** link, and then select the Windows Agent and a subsystem below the Agent.
16. In the Method frame, select **Display Report**. The Average Response Rate of Device File report is displayed below **User Reports**.

Example of Customizing a Solution Set

The following example describes how to customize the Port Performance Details report of the RAID solution set to create a Port Performance Details report. The report will display a graph that shows average transfers per second.

To customize the Port Performance Details report:

1. In the global tasks bar area of the Main Console, click **Go** and then **Performance Reporter**. The main window of Performance Reporter is displayed.
2. In the Navigation frame of the main window, select the **Reports** link. The report tree is displayed. The **System Reports** area displays a tree of the folders and reports for the solution set.
3. In the Navigation frame of the main window, in **System Reports**, click **RAID, Troubleshooting, Recent Past**, and then **Port Performance Details**. The Port Performance Details report is selected.
4. In the Method frame, choose the **Copy** method. The Copy window is displayed in the Information frame, as is the report tree of the copy destination.
5. Click **OK**. The **Port Performance Details** report is copied to **User Reports**.
6. In the Method frame, choose the **Edit** method. The Edit > Name and Type window is displayed in the Information frame.
7. In **Report Type**, make sure that **Historical (Single Agent)** is selected, then click **Next**. The Edit > Field window is displayed.
8. In **Record**, make sure that the **Port Summary (PI_PTS)** record is selected.
9. In **All fields**, select the following fields if they are not already selected: **Port Number**, **Port Name**, **Max I/O /sec**, **Min I/O /sec**, **Avg I/O /sec**, **Max xfer /sec**, **Min xfer /sec**, and **Avg xfer /sec**. Click **Next >**. The Edit > Filter window is displayed.
10. Select the field **Port Name**, = for **Condition**, and **Specify when displayed**. Click **Add**, and then select **AND** and **Simple**. **Port Name = prompt("")** is displayed in **Conditional expression**. Click **Next >**. The Edit > Indication Settings (Historical) window is displayed.
11. Make sure that **Specify when displayed** is shown for **Date range** and **Minute** for the **Report interval**.
12. In **Maximum number of records**, specify 1440. Click **Next >**. The Edit > Components window is displayed.
13. Select the **Graph** check box for **Min xfer /sec**.
14. In **Display Key**, select (none) for **Field**. Click **Next >**. The Edit > Graph window is displayed.

15. Select **Line** for the **Graph type**, and then make sure that **By column** is selected and that **(none)** is shown for both **Data label 1** and **Data label 2**. Click **Finish**. The settings are saved, and the Edit > Graph window closes.
16. In the Navigation frame of the main window, click the **Agents** link, and then select the RAID Agent and a subsystem below the Agent.
17. In the Method frame, select **Display Report**. The **Port Performance Details** report is displayed below **User Reports**.
18. Click the **Port Performance Details** report.
19. Select the **Date range**, **Max records**, and **Port name**, and then click **OK**. The Port Performance Details report is displayed.

Example of Creating a Report When Filter Conditions Are Connected by OR

The following example describes how to create an I/O Response Time report that displays a line graph showing the I/O Response time trend for a particular device file. Agent for Platform (Windows) collects the data about the device file.

To create the I/O Response Time report:

1. In the global tasks bar area of the Main Console, click **Go** and then **Performance Reporter**. The main window of Performance Reporter is displayed.
2. In the Navigation frame of the main window, select the **Reports** link. The report tree is displayed.
3. In the Navigation frame of the main window, click **User Reports**.
4. In the Method frame, choose the **New Report** method. The New Report > Name and Type window is displayed in the Information frame.
5. In **Report Name**, enter `I/O Response Time`. For **Product**, select **Windows(4.0)**.
6. In **Report Type**, select **Historical (Single Agent)**, and then click **Next**. The New Report > Field window is displayed.
7. In **Record**, select **Physical Disk Overview(PI_PHYD)**.
8. In **All fields**, select the following fields: **Avg Disk Bytes/Xfer**, **% Disk Read Time**, **% Disk Time**, **% Disk Write Time**, **Avg Disk Bytes/Read**, **Avg Disk Bytes/Write**, **Avg Disk Queue Length**, **Avg Disk Read Queue Length**, **Avg Disk Secs/Read**, **Avg Disk Secs/Write**, **Avg Disk Secs/Xfer**, **Avg Disk Write Queue Length**, and **ID**. I/O response time is equivalent to the **Avg Disk Secs/Xfer** field. Click **Next >**. The New Report > Filter window is displayed.
9. Select the field **ID**, **=** for **Condition**, and **Specify when displayed**. Click **Add**, and then select **AND** and **Simple**. **ID = prompt("")** is displayed in **Conditional expression**.
10. Select the field **Disk Bytes/sec**, **>=** for **Condition**, and **Specify when displayed**. Click **Add**, and then select **OR** and **Simple**. **ID = prompt("") OR Disk Bytes/sec >= prompt("")** is displayed in **Conditional expression**.
11. Click **Next >**. The New Report > Indication Settings (Historical) window is displayed.
12. Select the **Specify when displayed** check box.
13. Make sure that **Specify when displayed** is shown for **Date range** and **Hour** for the **Report interval**.
14. In **Maximum number of records**, specify `1440`. Click **Next >**. The New Report > Components window is displayed.

15. I/O response time is equivalent to the **Avg Disk Secs/Xfer** field. Select the **Graph** check box for **Avg Disk Secs/Xfer**.
16. In **Display Key**, select **(none)** for **Field**. Click **Next >**. The New Report > Graph window is displayed.
17. Select **Line** for the **Graph type**, and then make sure that **By column** is selected. Enter **I/O Response Time** for **Y-axis**, and then select **ID** for **Data label 1** and **(none)** for **Data label 2**. Click **Finish**. The settings are saved, and the New Report > Graph window closes.
18. In the Navigation frame of the main window, click the **Agents** link and then select the Windows Agent and a subsystem below the Agent.
19. In the Method frame, select **Display Report**. The I/O Response Time report is displayed below **User Reports**.

Example of Creating a Line Graph (Single Field, Multiple Instances)

The following example describes how to customize the CPU Status (Multi-Agent) report of the Windows solution set to create a CPU Status (Multi-Agent) report. The report displays a line graph (single field, multiple instances) showing CPU usage.

To customize the CPU Status (Multi-Agent) report to display a line graph (single field, multiple instances):

1. In the Navigation frame of the main window, select the **Reports** link. The report tree is displayed. The **System Reports** area displays a tree of the folders and reports for the solution set.
2. In the Navigation frame of the main window, in **System Reports**, click **Windows, Operating System, Status Reporting, Daily Trend**, and then **CPU Status (Multi-Agent)**. The CPU Status (Multi-Agent) report is selected.
3. In the Method frame, choose the **Copy** method. The Copy window is displayed in the Information frame, as is the report tree of the copy destination.
4. Click **OK**. The CPU Status (Multi-Agent) report is copied to **User Reports**.
5. In the Method frame, choose the **Edit** method. The Edit > Name and Type window is displayed in the Information frame.
6. In **Report Type**, make sure that **Historical (Multiple Agents)** is selected, and then click **Next**. The Edit > Field window is displayed.
7. In **Record**, make sure that the **System Overview (PI)** record is selected.
8. In **All fields**, select the following fields: **CPU %**, **User CPU %**, **Privileged CPU %**, and **System Calls/sec**. Click **Next >**. The Edit > Filter window is displayed.
9. Select the field **Agent Host**, and **=** for **Condition**. Click **Next >**. The Edit > Indication Settings (Historical) window is displayed.
10. Make sure that **Specify when displayed** is shown for **Date range** and **Hour** for the **Report interval**.
11. In **Maximum number of records**, specify 1440. Click **Next >**. The Edit > Components window is displayed.
12. Select the **Graph** check box for **CPU %**. (Note that at least one **Graph** check box must be selected to display a graph.)
13. Click **Next >**. The Edit > Graph window is displayed.
14. Select **Line** for the **Graph type**, and then make sure that **By column** is selected, **CPU %** is selected for Y-axis, and that **Agent Instance** is shown for **Data label 1** and **(none)** for **Data label 2**. Click **Finished**. The settings are saved, and the Edit > Graph window closes.

15. In the Navigation frame of the main window, click the **Agents** link and then select **Multiselect, Windows** below Products, and multiple Agents below **Windows**.
16. In the Method frame, select **Display Report**. The **CPU Status (Multi-Agent)** report is displayed below **User Reports**.

Monitoring Operations Using Alarms

In a Tuning Manager series program, if you set threshold values for the performance data to be collected, you can set alarms to notify you when performance data exceeds a threshold.

This chapter describes how to use the GUI to set up alarms and how to set them to notify you of problems. For details on how to use commands to accomplish these tasks, see the *Hitachi Tuning Manager Agent Administration Guide*.

- ☐ [Overview of Alarms](#)
- ☐ [Process Flow for Setting and Operating Alarms](#)
- ☐ [Procedures before Setting Alarms](#)
- ☐ [Setting Alarms](#)
- ☐ [Operating Alarms](#)
- ☐ [Notes on Alarms](#)

Overview of Alarms

You can configure a Tuning Manager series program to notify you when the performance data monitored by using an Agent exceeds a threshold you have set. Use this function if you want to raise alarms about performance information.

The definition of how a system behaves when data reaches a threshold is called an **alarm**, and a set of alarms is called an **alarm table**. The alarm tables are located in unique **folders**, one of which exists for each type of Agent. These folders are displayed in the immediately lower hierarchical level of the Alarms tree that is displayed when you select the **Alarms** link in the Navigation frame of the Performance Reporter main window.

When the data reaches a threshold, the Agent reports the fact by issuing an **alarm event**. Upon receiving the alarm event, a Tuning Manager series program performs tasks that are called **actions**. The actions that a Tuning Manager series program can perform are as follows:

- Notifying users, such as the system administrator, by email
- Executing commands such as restoration programs
- Sending SNMP traps

By associating an alarm table with an Agent, you can detect when any thresholds are exceeded. Associating an alarm table with an Agent is called **binding**. You can bind only one alarm to each Agent. However, you can bind the same alarm to multiple Agents.

Process Flow for Setting and Operating Alarms

This section describes how to set and operate alarms and it includes a process flow.

Reference materials:

- For details on the commands in Tuning Manager series programs used for setting and operating alarms, see the *Hitachi Tuning Manager Command Line Interface Guide*.
- For details on the solution set alarms, see the following manuals:
 - *Hitachi Tuning Manager Hardware Reports Reference*
 - *Hitachi Tuning Manager Operating System Reports Reference*
 - *Hitachi Tuning Manager Application Reports Reference*

Setting and Operating Alarms

You can set and operate alarms by using either the Alarms window or commands of Performance Reporter. For details on how to do this by using commands, see the *Hitachi Tuning Manager Agent Administration Guide*.

Figure 6-1 shows an example of the Alarms window of Performance Reporter.

You can set an alarm in the following ways:

- Define a new alarm table and alarms. You can create a new alarm table for your system environment, and then define the alarms. Later, you can add new alarms to the table.
- Customize an existing alarm table or alarms. You can use any of the following methods:
 - **Use a solution set.** A solution set is a set of alarms that is included with an Agent for which necessary information has been preset. When you use a solution set, the alarms that are specified to be active in the solution set are enabled when the Agent starts.
 - **Customize a solution set.** You can copy a solution set and then customize it to match your monitoring objectives.
 - **Customize an existing alarm table or alarms.** You can copy and then customize an already defined alarm table or alarms.

To operate the alarms, associate (or bind) the alarm table you defined above with the Agent.



Note: By using the `jpcalarm` command to create an alarm definition file, you can create a maximum of 50 alarms at once. This is useful, for example, when setting alarms in batch on multiple servers in a large-scale system.



Note: If you use Internet Explorer 6.0 to perform operations for the Alarms window of Performance Reporter, do not use the mouse wheel to select an item from the drop-down list. If you use the wheel to scroll the drop-down list, an error (KAVJS0037-E) might occur. If this error occurs, retry the operation.

Process Flow for Setting and Operating Alarms

The figure below shows the process flow for setting and operating alarms.

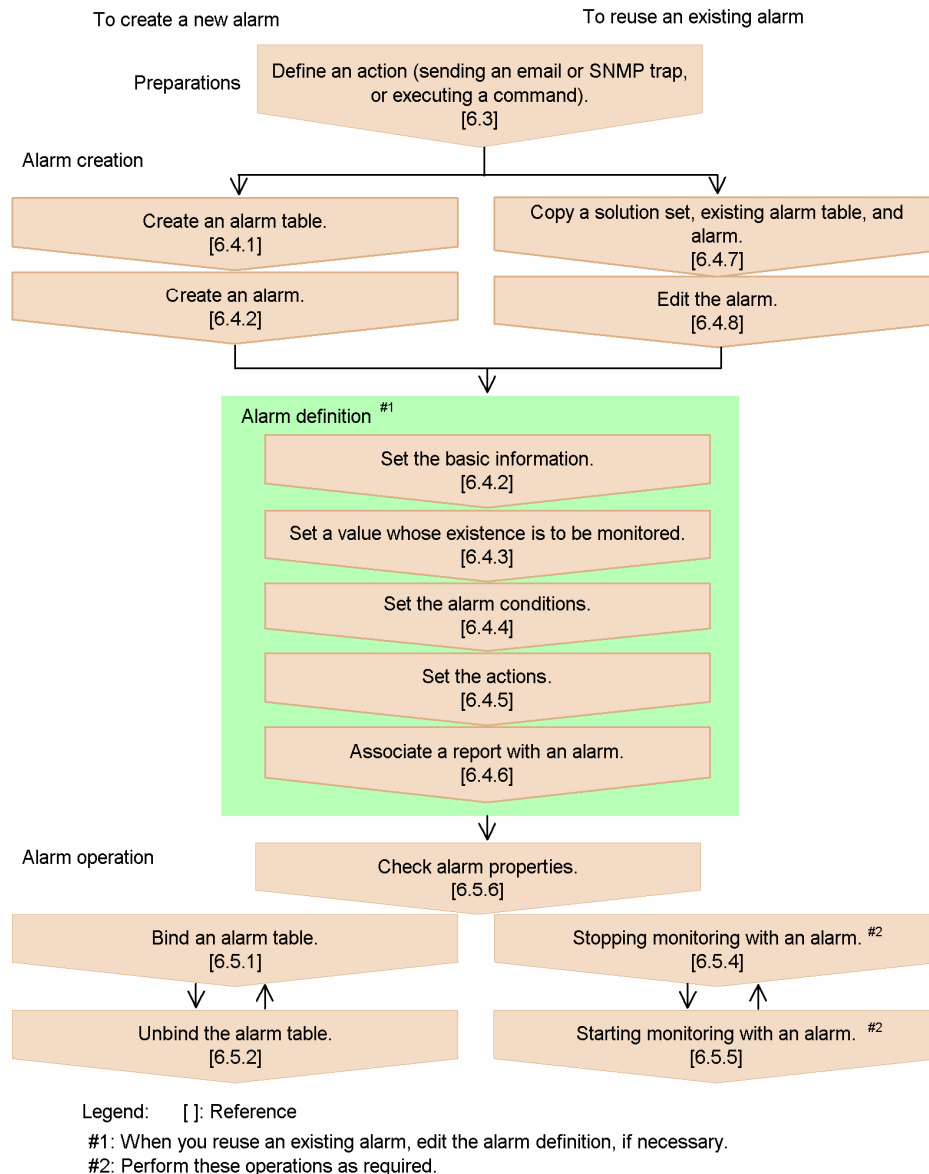


Figure 6-1 Process Flow for Setting and Operating Alarms

Procedures before Setting Alarms

This section describes the setting procedures to follow before setting alarms.

Before setting an alarm, you must define the action that will be executed when the corresponding alarm event occurs. You can define this action by changing the **Action Handler** and **Trap Generator** properties from the Performance Reporter GUI.

Configuring the email Sender

To send a notification email when an alarm event occurs in an Agent, you need to configure the email sender.

To configure the email sender:

1. Log in to the Tuning Manager server with a user who has the Admin (application management) permission.
The main window of the Main Console is displayed.
2. In the global tasks bar area, choose **Go** and then **Performance Reporter**.
The main window of Performance Reporter is displayed.
3. In the Navigation frame of the Performance Reporter main window, select the **Services** link.
The Services window appears.
4. In the Navigation frame, click the **Machines** folder.
This folder displays the folders that show the hosts where Tuning Manager series programs are installed.
5. Select the Action Handler service on the host that will send the email.
The name of the icon indicating the Action Handler service begins with **PH**.
6. In the Method frame, select **Properties**.
The Properties window appears.
Specify the values of the properties as follows:

Email in Capabilities

Specify whether to send an email. You can select **Yes** or **No**.

Yes: An email is sent when an alarm event is issued.

No: No email is sent when an alarm event is issued.

SMTP Host in Mail

Specify the host name or IP address of the SMTP server to send email from. You can use a maximum of 100 bytes of alphanumeric characters and hyphens.

SMTP Sender in Mail

Specify the email address of the sender. You can use a maximum of 100 bytes of symbols and alphanumeric characters.

Mail Subject in Mail

Specify the email subject. You can use a maximum of 100 bytes of characters. The following table describes the variables you can specify.

Table 6-1 Variables that Can Be Specified for Mail Subject

Variable	Description
%AIS	The alarm name specified for Alarm name
%ANS	The name of the Agent to which this alarm table is bound
%CVS[n][.p]	The measurement value of performance data n The position (order) of the conditional expression when more than one conditional expression is specified. If 0 or a value greater than the number of conditional expressions is specified, the measurement value of the field specified for the first conditional expression is displayed. p The number of decimal places to display (rounded)
%HNS	The name of the host on which the Agent to which the alarm table is bound is running
%MTS	The message text that was specified for Message
%PTS	The product name specified for Product
%SCS	The alarm condition that triggered the output of the message
%SCT	The system time of the host on which the Agent whose alarm was evaluated is running

By default, %SCS: %PTS %AIS on %HNS is specified.

Charset in Mail

Specify the character encoding of the email to be sent. You can select `iso-2022-jp` or `utf-8`.

Protocol in Mail

Specify the protocol to use when the email is sent. You can select `IPv6` or `IPv4`. The Tuning Manager server prioritizes the selected protocol for use.

- Click the **OK** button.

The values specified in step 5 are enabled.

Configuring the Host to Execute Commands

To automatically execute commands so that you can be notified when an alarm event occurs in an Agent, you must set the property of the Action Handler service on the host that will execute the commands in the Properties window of the Services window in Performance Reporter, as follows (An Action Handler service is indicated by an icon whose name begins with **PH.**):

- **Script in Capabilities:** Specify **Yes**.

The Action Handler service you select in **Action handler** of the **Command** field in the New Alarm > Action Definitions window is used when the commands are executed. By default, the used Action Handler service is the one that resides on the same host as the Agent bound to this alarm table event (indicated as **LOCAL** on the **Command** tab).

Configuration for Sending an SNMP Trap

To send an SNMP trap so that you can be notified when an alarm event occurs in an Agent, you must set the property of the Trap Generator service that will issue the SNMP trap in the Properties window of the Services window in Performance Reporter by performing the following procedure:

To specify settings for sending an SNMP trap:

1. Log in to the Tuning Manager server with a user who has the Admin (application management) permission.

The main window of the Main Console is displayed.

2. In the global tasks bar area, choose **Go** and then **Performance Reporter**.

The main window of Performance Reporter is displayed.

3. In the Navigation frame of this window, select the **Services** link.

The Services window appears.

4. In the Navigation frame, click the **Collection Manager** folder.

This folder displays folders that show the hosts on which Tuning Manager series programs are installed.

5. Select the Trap Generator service on the host that will send the email.

The name of the icon indicating the Trap Generator service begins with **PC**.

6. In the Method frame, select the **Properties** method.

The Properties window appears. Specify the value of the property as follows:

ADD A DESTINATION in **ADD OR DELETE A TRAP DESTINATION**

Specify the host name or IP address of the destination to which the SNMP trap will be sent. You can use a maximum of 75 bytes of alphanumeric characters and hyphens.

7. Click the **OK** button.

The trap destination setting for the specified host is added to **Trap Destinations**. Specify the values of the properties as follows:

Retry Count in Trap Destinations

Specify the number of retries. You can specify an integer in the range from 0 to 32,767.

Retry Interval in Trap Destinations

Specify the interval between retries (in seconds). You can specify an integer in the range from 1 to 32,767.

Trap Port in Trap Destinations

Specify the port number of the destination. You can specify an integer in the range from 1 to 32,767.

Enabled in Trap Destinations

Specify whether to enable the destination. You can select **Yes** or **No**.



Note: If you want to delete the settings for a host to which an SNMP trap is sent, select the host name from **DELETE A DESTINATION** in **ADD OR DELETE A TRAP DESTINATION**, and then click the **OK** button. The settings will be deleted from **Trap Destinations**.

Setting Alarms

Creating an Alarm Table

To create a new alarm table:

1. Log in to the Tuning Manager server with a user who has the Admin (application management) permission.
The main window of the Main Console is displayed.
2. In the global tasks bar area, choose **Go** and then **Performance Reporter**.
The main window of Performance Reporter is displayed.
3. In the Navigation frame of the Performance Reporter main window, select the **Alarms** link.
The Alarms window appears.
4. In the Navigation frame, select the folder of the Agent in which to create the alarm table.
The selected folder is marked with a check mark. Alarm tables cannot be created immediately under the **Alarms** folder. You must create them in the folder of the Agent.
5. In the Method frame, select the **New Alarm Table** method.
In the Information frame, the New Alarm Table > Main Information window appears.
6. In the **General Settings** area, select a product (a data model), and then enter the alarm table name.

During this step, you can create an alarm in the newly created alarm table by specifying basic information such as the alarm name. For details on how to create alarms, see [Creating an Alarm \(Specifying the Basic Information\)](#).

Alarm table name: You can use a maximum of 64 bytes of alphanumeric characters, spaces, and the following symbols: % - () _ . / @ []

For example, in Agent for Platform (Windows), which is for the inventory management system, if you want to create an alarm table for monitoring by using data model version 6.0, specify the following settings:

Product: Specify `Windows(6.0)`.

Alarm table name: Specify `Inventory Control System(Win)`.

Make sure that you select a data model version that matches the data model version of the Agent to which this alarm table is bound. If Agents of the same type exist and their data model versions differ, we recommend that you select the oldest data model version.

To check the data model version of an Agent:

- a. In the Agent tree of the Navigation frame, click the Agent to display in the report.
- d. In the Method frame, click **Properties**. The Service Properties window is displayed.
- e. In this window, click the Agent. The data model version is displayed at the bottom of the Information frame.

Creating an Alarm (Specifying the Basic Information)

To create a new alarm in an alarm table:

1. Log in to the Tuning Manager server with a user who has the Admin (application management) permission.
The main window of the Main Console is displayed.
2. In the global tasks bar area, choose **Go** and then **Performance Reporter**.
The main window of Performance Reporter is displayed.
3. In the Navigation frame of the Performance Reporter main window, select the **Alarms** link.
The Alarms window appears.
4. In the Navigation frame, select the folder of the Agent in which to create an alarm table.
The selected folder is marked with a check mark.
5. In the Navigation frame, select the alarm table in which to create an alarm.
The selected alarm table is marked with a check mark.
6. In the Method frame, select the **New Alarm** method.
In the Information frame, the New Alarm > Main Information window appears.
7. In the **General Settings** area of the New Alarm > Main Information window, specify the basic information for the alarm.

Product

The product (data model) you selected in the Navigation frame is displayed.

Alarm table name

The alarm table name you selected in the Navigation frame is displayed.

Alarm name

You can use a maximum of 20 bytes of alphanumeric characters, spaces, and the following symbols: % - () _ . / @ []

Alarm message

You can either enter a maximum of 255 bytes of characters or omit this item.

You can display information related to the alarm by specifying a variable. The following table lists and describes the variables you can specify.

Table 6-2 Variables that Can Be Specified

Variable	Description
%AIS	Represents the alarm name set in Alarm name .
%ANS	Represents the name of the Agent to which this alarm table is bound.
%ATS	Represents the name of the alarm table for which this alarm is defined.
%CVS[n][.p]	Represents the measurement value that triggered the alarm report (that satisfied the conditional expression). n# Specifies the position of the field as 1 or a greater numeric value when more than one conditional expression is specified in the New Alarm > Alarm Conditions window or the Edit > Alarm Conditions window. If 0 or a value greater than the number of conditional expressions is specified, the measurement value in the first field is displayed. p# Specifies the number of decimal places to be displayed (rounded).
%HNS	Represents the name of the host where the Agent to which this alarm table is bound is running.
%PTS	Represents the product name set in Product .
%SCS	Represents the alarm condition that triggered output of the message.
%SCT	Represents the system time on the host where the Agent whose alarm was evaluated is running.

#: Only a maximum of five digits can be specified for the value. If you specify six or more digits, only the first five digits are used and displayed in the alarm notification message.



Note:

If the length of the message text exceeds 255 bytes after variables are replaced by values, the Agent Collector service outputs the following message when the alarm is reported:

KAVE00184-W The number of characters after expanding the variable exceeds the maximum for the value field. (service=service-ID, alarm table=alarm-table-name, alarm=alarm-name)

If this message appears, adjust the character string to be specified in the message text and the number of digits to be specified for %CVS so the message text length is no more than 255 bytes.

Monitor whether the value exists

Specifies that a given field is to be monitored for the presence of a value and that the alarm is to be issued when no value exists in the field. This function can be used to issue an alarm when a critical program is not running (whether or not the processing being executed can be monitored). This option can be used for all products. By default, this option is not selected.

This option can be selected only when a new alarm is being created.

Product displays the product (the data model) that you selected in the Navigation frame. **Alarm table name** displays the name of the alarm table that you selected in the Navigation frame.

For example, to define an alarm to monitor the usage of the processor, specify the following settings (see Figure 6-2):

Alarm name: CPU Usage

Alarm message: The CPU is at %CVS% utilization



Note: If you have selected **Monitor whether the value exists** in the alarm definition, the value specified in the conditional expression does not exist in the collected data when the alarm is reported. In this case, if you specify the variable %CVS in the message or the Mail Subject, the variable is replaced with an empty string.

8. In the **Advanced settings** area of the New Alarm > Main Information window, specify the monitoring time and damping of the alarm.

Enable alarm

Specifies that the alarm is to become active immediately after it has been created. By default, this check box is selected.

Always notify

Specifies that the alarm is always to be reported when a conditional expression is satisfied.

When this check box is selected, whether any conditional expressions are satisfied is monitored each time the alarm is evaluated. If a conditional expression indicating an Abnormal value or Warning value is satisfied, the alarm is issued. If no conditional expressions are satisfied (i.e., the conditions are all normal), the alarm is not issued.

Also, when this option is selected, changes to the Agent's status are not monitored, so no Agent events are issued.

When this option is not selected, the alarm is issued only when there has been a change in status since the previous evaluation. For example, if the status during the previous evaluation was abnormal (red), no alarm is issued if the status of the current evaluation is still abnormal (red).

By default, this check box is not selected.

Evaluate all data

Specifies that all collected data for multi-row (multi-instance) records is to be evaluated.

When this check box is not selected, the alarm is issued only for the first data evaluated for the record that has the worst status. By default, this check box is not selected.

The following table shows how alarm evaluation (notification) is executed for each record type depending on whether **Always notify** and **Evaluate all data** are selected:

Table 6-3 Alarm Evaluation (Notification) Depending on Whether “Always notify” or “Evaluate all data” Is Selected

Conditional expression	Record type	Always notify	Evaluate all data	Alarm evaluation (notification)
When Monitor whether the value exists is not selected	Single-row record ^{#1}	N	N	If the abnormal condition is satisfied and the previous alarm was not abnormal (red), then the system sends an abnormal (red) alarm. If no data satisfies the abnormal condition, but the warning condition is satisfied and the previous alarm was not a warning (yellow), then the system sends a warning (yellow) alarm. If none of the above conditions are satisfied and the previous alarm was abnormal (red) or a warning (yellow), then the system sends a normal (green) alarm.
		N	Y	
		Y	N	If either the abnormal or the warning condition is satisfied, the system sends an alarm indicating abnormality (or warning condition), regardless of the previous alarm.
		Y	Y	
	Multi-row record ^{#2}	N	N	If one data item satisfies the abnormal condition and the previous alarm was not abnormal (red), then the system sends an abnormal (red) alarm for that data item. If no data satisfies the abnormal condition but one data item satisfies the warning condition, and the previous alarm was not a warning (yellow), then the system sends a warning (yellow) alarm for that data item. If none of the collected data satisfies either of the above conditions and the previous alarm was abnormal (red) or a warning (yellow), then the system sends a normal (green) alarm. Note: All the collected data might not be evaluated because alarm evaluation terminates when a data item satisfying the condition is found.
		N	Y	

Conditional expression	Record type	Always notify	Evaluate all data	Alarm evaluation (notification)
		Y	N	When data that satisfies the abnormal condition is found, the system sends an alarm on the basis of that data regardless of the previous alarm notification. When data that satisfies the abnormal condition is not found, but data that satisfies the warning condition is found, the system sends an alarm on the basis of that data regardless of the previous alarm notification. Note: All the collected data might not be evaluated because alarm evaluation terminates when a data item satisfying the condition is found.
		Y	Y	The system sends an alarm indicating abnormality (or the warning condition) for each data item that satisfies either the abnormal or the warning condition. Note: Because all data is evaluated, multiple alarms might be sent for the same interval.
When Monitor whether the value exists is selected	Multi-row record #2	N	N	The system checks for a value specified in the New Alarm > Alarm Conditions window or the Edit > Alarm Conditions window (which defines conditional expressions), based on all the collected data. If there is no such value (that is, no specified condition is satisfied), then the system sends an abnormal (red) alarm. Note: The system sends an alarm only once, indicating that processing is disabled. If no collected data is found, no alarm is evaluated.
		N	Y	
		Y	N	The system checks for a value specified in the New Alarm > Alarm Conditions window or the Edit > Alarm Conditions window (which defines conditional expressions), based on all the collected data. If there is no such value (that is, no specified condition is satisfied), then the system sends an abnormal (red) alarm. Note: The system sends an alarm each time. If no collected data is found, no alarm is evaluated.
		Y	Y	

Legend:

Y: Checked

N: Not checked

#1

A single-row record is a single-instance record.

#2

A multi-row record is a multi-instance record.

Monitoring time range

Specifies the time range during which the collected data is to be monitored.

Always monitor

Specifies that alarms are always to be monitored, 24 hours a day.

By default, this check box is selected.

Start

Specify an alarm monitoring start time (local time[#]).

This option can be specified when **Always monitor** is not selected.

By default, the current time is displayed.

The permitted value range is 00:00 to 23:59.

End

Specifies an alarm monitoring end time (local time[#]).

This option can be specified when **Always monitor** is not selected.

By default, the current time is displayed.

The permitted value range is 00:00 to 23:59.

If Standard Time is changed to Daylight Saving Time (DST) while you are performing operations and the start or end time of DST is within the monitoring time range, the following effects might occur:

The time when DST starts: Alarms might not be issued. For example, alarms for 2:00 AM to 2:59 AM are not issued because the system recognizes the time after 1:00 AM as 3:00 AM due to the transition to DST.

The time when DST ends: Duplicate alarms might be issued. For example, alarms for 0:00 AM to 0:59 AM are issued redundantly because the system recognizes the time after 1:00 AM as 0:00 AM.

Damping

Specifies whether the alarm is to be issued when the threshold is exceeded the specified number of times while evaluating alarms the specified number of times.

Report alarm when the following damping condition is reached.

Specifies that the alarm is to be issued when alarms occur at least as often as the specified occurrence frequency.

By default, this check box is not selected.

occurrence(s) during

Specify the number of times alarms are to be evaluated and the number of times the threshold has to be exceeded before the alarm is issued. Use the up and down buttons to specify the number of times the threshold has to be exceeded for **occurrence(s) during** and to specify the number of times alarms are to be evaluated for **interval(s)**.

These items can be specified only when **Report alarm when the following damping condition is reached.** is selected. The default is 1 for both fields.

The permitted values are integers in the range from 1 to 32,767.

Depending on whether **Always notify** is selected, an alarm is issued as follows:

If **Always notify** is not selected: The status of an alarm is evaluated based on its occurrence frequency. If the conditions are satisfied, the alarm is issued. The status of an alarm that is reported might be different from the data threshold because the result of evaluation based on the occurrence frequency affects the status of the alarm.

If **Always notify** is selected: Data whose status is Warning or Abnormal is reported if the warning or abnormal condition is satisfied based on the occurrence frequency during certain intervals. The result of evaluation based on the occurrence frequency does not affect the status of the alarm. If you specified the same value for both **occurrence(s) during** and **interval(s)**, the timing for reporting the alarm will change.

The following table lists and describes the occurrence frequency and the timing for reporting alarms.

Table 6-4 Occurrence Frequency and the Timing for Reporting Alarms

Occurrence frequency	Timing for reporting alarms
n/m	The alarm is reported when the threshold is exceeded n times during m intervals. Subsequently, the alarm is reported every time the threshold is exceeded n times during m evaluations of the alarm.
n/n	The alarm is reported when the threshold is exceeded once. Subsequently, the alarm is reported every n times the threshold is exceeded.

The following table shows the differences between the specifications of **Always notify** and **Evaluate all data** when the occurrence frequency is specified.

Table 6-5 Alarm Evaluation Depending on Specifications of “Always notify” and “Evaluate all data”

Always notify	Evaluate all data	Alarm evaluation (notification)
N	N	Specifies whether the alarm status is to be changed when the threshold is exceeded the specified number of times while evaluating alarms the specified number of times. The alarm is issued only when the alarm status has changed from the previously reported alarm status. The alarm status of the data satisfying the highest severity condition of the data collected when an alarm was issued is reported in an alarm. Note :Because the alarm status is based on the result of evaluating the occurrence frequency, the alarm status and the threshold of the reported data might differ.

Always notify	Evaluate all data	Alarm evaluation (notification)
N	Y	Specifies whether the alarm status is to be changed when the threshold is exceeded the specified number of times while evaluating alarms the specified number of times. The alarm is issued only when the alarm status has changed from the previously reported alarm status. If the alarm has the warning or abnormal status, the alarm status of all data satisfying the alarm condition at the time the alarm is issued is reported. Note :Because the alarm status is based on the result of evaluating the occurrence frequency, the alarm status and the threshold of the reported data might differ.
Y	N	Specifies whether the alarm is to be issued when the threshold is exceeded the specified number of times while evaluating alarms the specified number of times. You can use this combination of settings to suppress the occurrence frequency of alarms. The data satisfying the highest severity condition of the data collected when an alarm was issued is reported in the alarm.
Y	Y	Specifies whether the alarm is to be issued when the threshold is exceeded the specified number of times while evaluating alarms the specified number of times. You can use this combination of settings to suppress the occurrence frequency of alarms. All data satisfying the warning or abnormal condition at the time an alarm is issued is reported in the alarm.

Legend:

Y: Checked

N: Not checked

For example, to define an alarm table to monitor the usage of the processor, and to monitor the target 24 hours a day and notify you when the threshold is exceeded two times during three monitoring intervals, specify the following settings (see Figure 6-3):

Enable alarm: selected

Always monitor: selected

Report alarm when the following damping condition is reached.:
selected

2 **occurrence(s) during** 3 **Interval(s)**



Note: The damping setting is valid even if you specify the monitoring time range. For example, if you set the alarm to be issued when the threshold is exceeded two times during three intervals and a monitoring time range from 09:00 to 21:00, and then the threshold is exceeded two times during that day, if the threshold is again exceeded even once after 9:00 the following day, the alarm will be issued.

9. Click the **Next >** button.

The next window and the available alarm conditions change depending on whether you selected **Monitor whether the value exists**.

- If **Monitor whether the value exists** has been selected:
You are guided to the Alarm Conditions window. Go to [Specifying a Value Whose Existence is to Be Monitored](#) to specify the conditional expression for monitoring to check any field for the value.
- If **Monitor whether the value exists** has not been selected:
You are guided to the Alarm Conditions window. Go to [Specifying the Alarm Conditions](#) to specify the alarm conditions.

Figure 6-2 New Alarm > Main Information Window

Figure 6-3 Example of Specifying the Advanced Alarm Settings (Such as the Start and End Times and Damping Condition)

Specifying a Value Whose Existence is to Be Monitored

To specify a value whose existence is to be monitored:

1. Specify the value whose existence is to be monitored.

Record

Select the record from the drop-down list. The list only contains multi-instance records.

Field

Select the field from the drop-down list. The field located at the top of the drop-down list is displayed by default.

This item is enabled when a selection is made in **Record**, and fields that correspond to the selected record are displayed in the drop-down list.

Description button

Displays a new window containing the record's description and its fields.

Value

Specifies the value to be monitored in the field as an integer, a decimal number, or a character string of a maximum of 127 bytes. It is case sensitive. If a program name is specified, the extension is not needed.

The specifiable values depend on the field. For details, see the chapter that describes records in the *Hitachi Tuning Manager Hardware Reports Reference*, *Hitachi Tuning Manager Operating System Reports Reference*, or *Hitachi Tuning Manager Application Reports Reference*.

For example, to monitor whether a particular process is running for Agent for Platform (Windows), specify the following settings (see Figure 6-4):

Record: Process Detail (PD)

Field: Program

Value: *name-of-the-program-to-be-monitored* (The program name does not require its extension and is case sensitive).

2. Click the **Next >** button.



Note: Fields of data type `time_t`, `timeval`, or `utime` are not displayed for **Field** because they cannot be used in the conditional expressions of an alarm.

Figure 6-4 New Alarm > Alarm Conditions Window

Specifying the Alarm Conditions

To specify the alarm conditions:

1. Specify the alarm conditions.

Record

Select the target record for specifying a conditional expression from the drop-down list.

Field

Select the target field for specifying a conditional expression from the drop-down list. This item is enabled when a selection is made in **Record**, and fields that correspond to the selected record are displayed in the drop-down list.

Fields whose data type is `time_t`, `timeval`, or `utime` are not displayed in the drop-down list because they cannot be specified for an alarm conditional expression.

The field located at the top of the drop-down list is displayed by default.

Description button

Displays a new window containing the description of the record and its fields.

Condition

Select the operand to be used for specifying the conditional expression from the drop-down list. This item is enabled when a selection is made in **Record**.

The following table lists and describes the operands that can be selected:

Table 6-6 Operands that Can Be Selected for Conditional Expressions

Operand	Description
=	The value in Field is equal to the value in Value.
<	The value in Field is less than the value in Value. For a character string field, comparisons are made in ascending order of the ASCII codes.
<=	The value in Field is less than or equal to the value in Value. For a character string field, comparisons are made in ascending order of the ASCII codes.
>	The value in Field is greater than the value in Value. For a character string field, comparisons are made in ascending order of the ASCII codes.
>=	The value in Field is greater than or equal to the value in Value. For a character string field, comparisons are made in ascending order of the ASCII codes.
<>	The value in Field does not equal the value in Value.

The default is =.

Abnormal value

Specify the threshold value that is to be used as the reference for determining an Abnormal-condition alarm during alarm evaluation. You can specify an integer, a decimal number, or a character string of a maximum of 750 bytes. This is the value in the abnormal conditional expression. The values that can be specified depend on the field. For the values that can be specified, see the chapter that describes records in the *Hitachi Tuning Manager Hardware Reports Reference*, *Hitachi Tuning Manager Operating System Reports Reference*, or *Hitachi Tuning Manager Application Reports Reference*.

You can specify the asterisk (*) wildcard character in a character string. For example, if you specify *item-name*="*AAA*", monitoring would be of all character strings that contain AAA.

Warning value

Specify the threshold value that is to be used as the reference for determining a Warning-condition alarm during alarm evaluation. You can specify an integer, a decimal number, or a character string of a maximum of 750 bytes. This is the value in the warning conditional expression. The values that can be specified depend on the field. For the values that can be specified, see the chapter that describes records in the *Hitachi Tuning Manager Hardware Reports Reference*, *Hitachi Tuning Manager Operating System Reports Reference*, or *Hitachi Tuning Manager Application Reports Reference*.

You can specify the asterisk (*) wildcard character in a character string. For example, if you specify *item-name*="*AAA*", monitoring would be for all character strings that contain AAA.

For example, to monitor the usage of a processor for Agent for Platform (Windows) by issuing a warning alarm when the usage of the processor exceeds 80% and issuing an abnormal alarm when it exceeds 90%, specify the following settings (see Figure 6-5):

Record: System Overview (PI)

Field: CPU%

Condition: >

Abnormal value: 90

Warning value: 80

2. Click the **Add** button.

Unless you have specified settings for both **Abnormal value** and **Warning value**, you cannot add conditional expressions. The conditional expressions are added to both **Abnormal condition** and **Warning condition**.

You can specify multiple conditional expressions. Multiple conditional expressions are combined with AND operators, and the alarm is issued when all of the expressions are satisfied.

Note that, if you select a conditional expression that has already been added to **Abnormal condition** or **Warning condition**, and then specify the alarm condition, clicking the **Update** button overwrites the selected conditional expression.

The following explains **Abnormal condition**, **Warning condition**, and the buttons displayed to their right:

Abnormal condition

Lists the abnormal conditional expressions that have been set. To add conditional expressions here, set **Record**, **Field**, **Condition**, **Abnormal value**, and **Warning value**, and then click the **Add** button. To change a conditional expression, select it, and then click the **Update** button.

A maximum of five abnormal conditional expressions with a maximum length of 749 bytes each can be stored.

Warning condition

Lists the warning conditional expressions that have been set. To add conditional expressions here, set **Record**, **Field**, **Condition**, **Abnormal value**, and **Warning value**, and then click the **Add** button. To change a conditional expression, select it, and then click the **Update** button.

A maximum of five warning conditional expressions with a maximum length of 749 bytes each can be stored.

Edit button

Displays the conditional expression selected in Abnormal condition and Warning condition in **Record**, **Field**, **Condition**, **Abnormal value**, and **Warning value** for editing. You cannot select more than one conditional expression at a time. This button is enabled only when at least one conditional expression is set in **Abnormal condition** and **Warning condition**.

Delete button

Deletes selected conditional expressions from **Abnormal condition** and **Warning condition**.

Delete All button

Deletes all conditional expressions from **Abnormal condition** and **Warning condition**.

3. Click the **Next >** button.

You are guided to the New Alarm > Action window. Go to [Specifying the Actions](#).

New Alarm > Alarm Conditions

Cancel < Back Next > Finish

Record: System Overview (PI) Description

Field: CPU % Description

Condition: >

Abnormal value: 90 *Decimal fraction*

Warning value: 80 *Decimal fraction*

Add Update

Abnormal condition:	Warning condition:
CPU % > "90.000"	CPU % > "80.000"

Edit

Delete

Delete All

Cancel < Back Next > Finish

Figure 6-5 New Alarm > Alarm Conditions Window

Specifying the Actions

Specify the actions to be performed by the system when the status of the alarm changes. The actions the system can perform are as follows:

- Sending an email
- Executing any command
- Sending an SNMP trap

New Alarm > Actions

Cancel < Back Next > Finish

Actions to be executed

Action	Abnormal	Warning	Normal
Email	☐	☐	☐
Command	☐	☐	☐
SNMP	☐	☐	☐

Report to be displayed

System/Monthly Trend/CPU Trend (Multi-Agent) Browse Delete

Cancel < Back Next > Finish

Figure 6-6 New Alarm > Action Window

**Notes:**

- You cannot select **Warning** if you selected **Monitor whether the value exists** in the **General Settings** area of the New Alarm > Main Information window.
- You cannot select **Normal** if you selected **Always notify** in the **Advanced settings** area of the New Alarm > Main Information window.
- You can combine multiple actions.
- If you want an email to be sent, settings are required beforehand. (See [Configuring the email Sender.](#))
- If you want a command to be executed, settings are required beforehand. (See [Configuring the Host to Execute Commands.](#))
- If you want an SNMP trap to be sent, settings are required beforehand. (See [Configuration for Sending an SNMP Trap.](#))

Sending Emails

To send an email when an alarm event occurs:

1. In the New Alarm > Action window, select **Email**.
2. Select **Abnormal**, **Warning**, or **Normal** as the trigger for sending the email.
3. Click the **Next >** button.

The **Email Settings** area appears.

4. Specify the address, body, and other properties of the email.

Email address

Specify the email addresses of the parties to be notified with a maximum of 127 bytes of alphanumeric characters.

If you specify multiple email addresses, separate them with commas (,).

Action handler

Select the Action Handler service that will use the email notification function from the drop-down list. The Action Handler service name (service ID) that is displayed is the default.

If the Action Handler to be used is not included in the drop-down list, display the desired Action Handler's properties in the Services window, and in **Capabilities** set the property value for **Email** to Yes.

Variables

Displays variables that you can select to be set in the message text of the notification email. Select the desired variables from the displayed list, and then click the **Add Variable** button to add the selected variables to **Email body** as the message text for the email.

The following table lists and describes the variables that are displayed in **Variables**:

Table 6-7 Variables that Are Displayed in Variables

Item name	Variable name	Description
Date and time	%SCT	Specifies the system time on the host where the Agent whose alarm was evaluated is running.
Agent	%ANS	Specifies the name of the Agent to which the alarm table is bound.
Host	%HNS	Specifies the name of the host where the Agent to which the alarm table is bound is running.
Status	%SCS	Specifies the alarm condition that triggered output of the message.
Alarm name	%AIS	Specifies the alarm name that was set in Alarm name in the New Alarm > Main Information window or the Edit > Main Information window.
Alarm table name	%ATS	Specifies the alarm table name that was set in Alarm table name in the New Alarm > Main Information window or the Edit > Main Information window.
Message	%MTS	Specifies the message text that was set in Message in the New Alarm > Main Information window or the Edit > Main Information window.
Product	%PTS	Specifies the product name that was set in Product in the New Alarm > Main Information window or the Edit > Main Information window.
Measurement value	%CVS[n][.p]	Specifies the measurement value that triggered the alarm issuance (that satisfied a conditional expression). n [#] Specifies, as an integer, the position of the field when more than one conditional expression is specified in the New Alarm > Alarm Conditions window or the Edit > Alarm Conditions window. 1 is specified for the first field. If 0 or a value greater than the number of conditional expressions is specified, the measurement value of the first field is displayed. p [#] Specifies the number of decimal places to be displayed (rounding).

#: Only a maximum of five digits can be specified for the value. If you specify six or more digits, only the first five digits are used and displayed in the message of the alarm notification.

Add Variable button

Adds the variables selected from **Variables** to **Email body**.

Email body

Specify the message text for the notification email with a maximum of 1,000 bytes of characters. The following standard text is already set in **Email body**:

Date:%SCT, Host:%HNS, Product:%PTS, Agent:%ANS,
Alarm:%AIS(%ATS), State:%SCS, Message:%MTS

**Note:**

If the length of the message text exceeds 1,000 bytes after variables are replaced by values, the Agent Collector service outputs the following message when the alarm is reported:

KAVE00184-W The number of characters after expanding the variable exceeds the maximum for the value field. (service=service-ID, alarm table=alarm-table-name, alarm=alarm-name)

If this message appears, adjust the character string to be specified in the message string and the number of digits specified for %CVS so the message text length is no more than 1,000 bytes.

For example, suppose you want to send the email under the following conditions:

- Email address: Send the email to T.Hitachi@Dept01.Hitachi.com.
- Action handler: Send the email through the Action Handler service with the host name WepAP.
- Email body: Send an email that contains the message "*date/time, host-name, product-name*".

In this case, specify the following settings (see Figure 6-7):

Email address: T.Hitachi@Dept01.Hitachi.com

Action handler: PH1WepAP

Email body: Date:%SCT Host:%HNS Product:%PTS

5. Click the **Finish** button.

The settings are completed.

New Alarm > Action Definitions

Cancel < Back Finish

Email Settings

Email address: T.Hitachi@Dept01.hitachi.com

Action handler: PH1pr-test
("PH1" + executing host name)

Variables

Date/Time (%SCT)
Agent name (%ANS)
Host name (%HNS)
Status (%SCS)

Add Variable

Email body:

Date: %SCT
Host: %HNS
Product: %PTS

Cancel < Back Finish

Figure 6-7 Edit > Action Definitions Window

Executing Any Command

To execute any command when an alarm event occurs:

1. In the New Alarm > Action window, select **Command**.
2. Select **Abnormal**, **Warning**, or **Normal** as the trigger for executing the command.
3. Click the **Next >** button.

The **Command Definition** area appears.

4. Specify the name, arguments, and other properties of the command to be executed.

Command name

Specify the name of the command (script) to be executed with a maximum of 511 bytes of alphanumeric characters. Except for the commands stored in the following directories, specify commands (scripts) using their full paths or the relative path of the current directory of a service:

- Action Handler service installation directory
- Path set in the PATH environment variable

To specify a relative path, use the Services window to check the current directory of the Action Handler service.

Action handler

Select the Action Handler service that will execute the command (script) from the drop-down list. LOCAL is displayed as the default, and it represents the host on which the Agent to which the alarm table is bound is running.

If the service name (service ID) of the Action Handler to be used is not included in the drop-down list, use the Services window to display the properties of the desired Action Handler service, and then set Yes in **Script** under **Capabilities**.

Variables

Displays the variables that you can select to be set as command arguments.

Select desired variables from the displayed list of variables and then click the **Add Variable** button to add the variables to **Command arguments** as the command arguments.

The variables that can be set are the same ones that are described in Variables under Email Settings.

Add Variable

Adds the variables selected from **Variables** to **Command arguments**.

Command arguments

Specify the parameters to be passed to the command (script) that will be executed with a maximum of 2,047 bytes of alphanumeric characters.

To issue JP1 events to a logical host in a logical host environment, add the `-r` logical-host-name option. If this option is omitted, JP1 events will be registered in the physical host.



Note:

If the length of the command argument exceeds 2,047 bytes after variables are replaced by values, the Agent Collector service outputs the following message when the alarm is reported:

KAVE00184-W The number of characters after expanding the variable exceeds the maximum for the value field. (service=service-ID, alarm table=alarm-table-name, alarm=alarm-name)

If this message appears, adjust the character string to be specified in the command argument and the number of digits specified for `%CVS` so the command argument length is no more than 2,047 bytes.

For example, suppose you want to execute the command under the following conditions:

- You want to execute the command `/usr/bin/LogOutput` to output log data.
- You want to execute the command through the Action Handler service with the host `WepAP`.

- You want to pass the date/time, host name, and message text to the command as parameters.

In this case, specify the following settings (see Figure 6-8):

Command name: /usr/bin/LogOutput

Action handler: PH1WepAP

Command arguments: Date:%SCT Host:%HNS %MTS



Note:

- You cannot use the following symbols in a character string that is passed to a command as a parameter:

< >

If you include these symbols in a character string, characters that appear before or after these symbols might be removed.

- You cannot redirect the standard output of a command to a file or other destination.
-

5. Click the **Finish** button.

The settings are completed.

New Alarm > Action Definitions

Cancel < Back Finish

Command Definition

Command name: /usr/bin/LogOutPut

Action handler: PH1pr-test

("PH1" + executing host name or "LOCAL" (Execute via the alarm monitor host))

Variables

Date/Time (%SCT)
Agent name (%ANS)
Host name (%HNS)
Status (%SCS)

Add Variable

Command arguments:

Cancel < Back Finish

Figure 6-8 Example of Setting a Command

Sending an SNMP trap When an Alarm Occurs

To send an SNMP trap when an alarm event occurs:

1. In the New Alarm > Action window, select **SNMP**.
2. Select **Abnormal**, **Warning**, or **Normal** as the trigger for sending the SNMP trap.
3. Click the **Finish** button.

The settings are completed.

For details about Management Information Base (MIB) objects of the SNMP trap to be sent, see the Appendix in the *Hitachi Tuning Manager Agent Administration Guide*.



Note: The SNMP trap is issued from the server, to which you logged in, on which Collection Manager (the Trap Generator service) is running.

Notes on Executing Actions

The following are cautionary notes on executing actions:

1. Program required for sending emails

To send emails, a mail server that conforms to SMTP is required.

2. Executable files when executing commands

- In Windows:

When executing commands, you can run files with the following extensions:

- EXE: Executable files
- COM: Executable (command) files
- BAT: Batch files

If you want to execute internal commands such as `DEL` or `DIR`, you must make a batch file and then execute the commands in batch.

Note that you can only specify program files that are accessible from the system account when the commands are executed. You cannot run files that are located in a network folder.

- In UNIX:

When executing commands, you can execute the types of files listed below. Note, however, that these files must have execution attributes added.

- Executable files
- Shell script files

Note that you can only specify program files that are accessible by users with root user permissions when the commands are executed. To run files that are located in an NFS-mounted directory, you must make those files accessible by users with root user permissions on the host.

3. Accounts for executing commands

- In Windows:

You must use a system account to execute commands (note that the account for the Action Handler service is also a system account).

Therefore, any resources that are viewed or updated by using the program must be accessible from a system account.

- In UNIX:

You must use an account with root user permissions to execute commands (note that the account for the Action Handler service has root user permissions).

Therefore, any resources that are viewed or updated by using the program must be accessible from an account with root user permissions.

4. Environment variables that are available when commands are executed

- In Windows:

The system environment variables that were in effect when the services of the Tuning Manager series programs started are available when commands are executed.

The profile information is not loaded when commands are executed.

- In UNIX:

The environment variables that were associated with root user permissions when the services of the Tuning Manager series programs started are available when commands are executed.

The profile information is not loaded when commands are executed. However, for details on `umask`, see 6.

5. Current directory during command execution

- In Windows:

During command execution, the current folder is the Action Handler service folder
(*Tuning-Manager-server-installation-folder*\jplpc\bin\action).

- In UNIX:

During command execution, the current directory is the Action Handler service directory (/opt/jplpc/bin/action).

6. Umask for the files created during command execution

- In Windows:

Umask is not applicable to the Windows environment.

- In UNIX:
When a command is executed, `umask` is set to `000` (the file permissions become `777`). You must respecify `umask` by executing an appropriate script file or program.

7. Other notes on executing commands

- In Windows:
 - You cannot run Win16-bit applications.
 - You cannot run applications that display windows or dialog boxes.
However, you can execute the command `net send` to display a dialog box, because the dialog box is displayed by the Messenger service of Windows, not by the command `net send`.
 - You cannot run applications that utilize the Windows messaging mechanism, DDE (Dynamic Data Exchange).
 - You cannot run applications that require interactive operations.
 - You cannot run resident programs that do not terminate.
 - You cannot run files with extensions that are associated with applications.
 - You cannot run programs that are located in network folders.
 - Do not specify programs on removable disks that are not ready for use.
 - In the startup settings of the Windows services, do not allow services to interact with the desktop.
 - You cannot retrieve information from the standard output or standard error output of executed programs.
- In UNIX:
 - You cannot run applications that require interactive operations.
 - You cannot run programs that involve `stty`, `tty`, `tset`, or `script` commands, which require interactive environments.
 - You cannot run resident programs that do not terminate.
 - You cannot run programs that do not have execution attributes added.
 - Do not specify programs on removable disks that are not ready for use.
 - You cannot retrieve the information from the standard output or standard error output of executed programs.

Associating a Report with an Alarm

To display a report when a defined alarm occurs, associate the report with the alarm in the New Alarm > Action window.

Before specifying the associated report:

You need to create the desired report in the Reports window before specifying it as an associated report. For details on how to create reports, see [Working with Reports from Performance Reporter](#) or [Customizing Reports](#).

To associate a report with an alarm:

1. In the **Report to be displayed** area of the New Alarm > Action window, click the **Browse** button.

The New Alarm > Action > Select a report window appears.

2. From the Reports tree, select a report to be associated with the alarm.

The selected report is marked with a check mark.

In the Reports tree, the only reports that are displayed are those that are for the same product as the alarm you are creating and also have a data model version that is the same as that of the alarm or earlier.

3. Click the **OK** button.

The report is associated with the alarm (see Figure 6-9).

4. Click the **Finish** button.

For details about displaying a report associated with an alarm, see [Displaying Reports with Performance Reporter](#).

Action	Abnormal	Warning	Normal
Email	☐	☐	☐
Command	☐	☐	☐
SNMP	☐	☐	☐

Report to be displayed
System/Monthly Trend/CPU Trend (Multi-Agent)

Figure 6-9 New Alarm > Action Window

Copying an Alarm Table or Alarm

This section describes how to copy alarm tables or alarms.

Copying an Alarm Table

To copy a solution set or alarm table:

1. Log in to the Tuning Manager server with a user who has the Admin (application management) permission.
The main window of the Main Console is displayed.
2. In the global tasks bar area, choose **Go** and then **Performance Reporter**.
The main window of Performance Reporter is displayed.
3. In the Navigation frame of the Performance Reporter main window, select the **Alarms** link.
The Alarms window appears.
4. In the Navigation frame, select the alarm table to copy.
The selected alarm table is marked with a check mark.
5. In the Method frame, select **Copy**.
In the Information frame, the Copy > Input Name (Alarm Table) window appears.
6. Enter the new alarm table name (see Figure 6-10).

New alarm table name

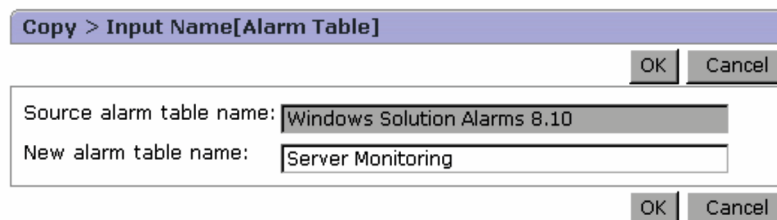
You can use a maximum of 64 bytes of alphanumeric characters, spaces, and the following symbols: % - () _ . / @ [] . Note that you cannot specify an alarm table name that begins with PFM.

7. Click the **OK** button.

The alarm table selected in step 3 is copied to the same location as the original alarm table.

Supplemental information:

The alarm table cannot be copied to a folder different from that of the original alarm table.



Copy > Input Name[Alarm Table]

OK Cancel

Source alarm table name: Windows Solution Alarms 8.10

New alarm table name: Server Monitoring

OK Cancel

Figure 6-10 Copy > Input Name (Alarm Table) Window

Copying an Alarm

When you want to add an alarm to an alarm table, you can copy an existing alarm.

To copy an alarm:

1. Log in to the Tuning Manager server with a user who has the Admin (application management) permission.

The main window of the Main Console is displayed.

2. In the global tasks bar area, choose **Go** and then **Performance Reporter**.

The main window of Performance Reporter is displayed.

3. In the Navigation frame of the Performance Reporter main window, select the **Alarms** link.

The Alarms window appears.

4. In the Navigation frame, select the alarm to copy.

The selected alarm is marked with a check mark.

5. In the Method frame, select **Copy**.

In the Information frame, the Copy > Input Name (Alarm) window appears.

6. Enter the new alarm name (see Figure 6-11).

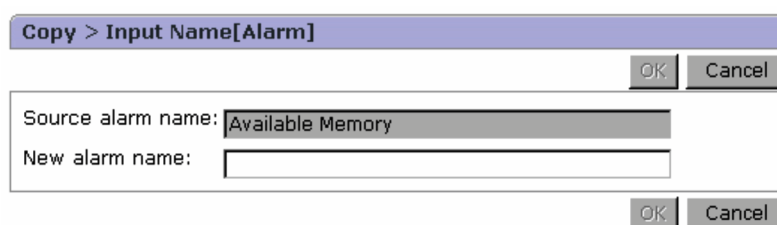
New alarm name

You can use a maximum of 20 bytes of alphanumeric characters, spaces, and the following symbols: % - () _ . / @ []

7. Click the **OK** button.

The alarm selected in step 3 is added.

Supplemental information: The alarm can only be copied into the alarm table of the original alarm.



Copy > Input Name[Alarm]

Source alarm name: Available Memory

New alarm name:

OK Cancel

Figure 6-11 Copy > Input Name (Alarm) Window

Editing an Alarm

To edit the definition of an existing alarm:

1. Log in to the Tuning Manager server with the Admin (application management) permission.
2. In the global tasks bar area, choose **Go** and then **Performance Reporter**.
The main window of Performance Reporter is displayed.
3. In the Navigation frame of the Performance Reporter main window, click the **Alarms** link to open the Alarms window.
4. In the Navigation frame, select the alarm to edit. The selected alarm is marked with a check mark.
5. In the Method frame, select **Edit**.
In the Information frame, the Edit > Main Information window appears.
6. Edit the definition of the alarm.

The subsequent steps are similar to those for creating a new alarm. For procedural details, see [Creating an Alarm \(Specifying the Basic Information\)](#) to [Specifying the Actions](#).

Supplemental information: When you edit existing alarms, you cannot modify the settings for **Product**, **Alarm table name**, or **Alarm name**.

Deleting an Alarm Table or Alarm

You can delete alarm tables or alarms that you no longer need.

Deleting an Alarm Table

To delete an alarm table:

1. Log in to the Tuning Manager server with the Admin (application management) permission.
2. In the global tasks bar area, choose **Go** and then **Performance Reporter**.
The main window of Performance Reporter is displayed.
3. In the Navigation frame of the Performance Reporter main window, click the **Alarms** link to open the Alarms window.
4. In the Navigation frame, select the alarm table to delete from the folder of the Agent. The selected alarm table is marked with a check mark.
5. In the Method frame, select **Delete**.
6. In the confirmation dialog, click the **OK** button.

The alarm table selected in step 3 is deleted.

Supplemental information: You can delete alarm tables even when they are active (bound to an Agent). Note that you cannot delete alarm tables whose names begin with PFM.

Deleting an Alarm

To delete an alarm:

1. Log in to the Tuning Manager with the Admin (application management) permission.
2. In the global tasks bar area, choose **Go** and then **Performance Reporter**.
The main window of Performance Reporter is displayed.
3. In the Navigation frame of the Performance Reporter main window, click the **Alarms** link to open the Alarms window.
4. In the Navigation frame, select the alarm to delete from the folder of the Agent. The selected alarm is marked with a check mark.
5. In the Method frame, select **Delete**.
6. In the confirmation dialog, click the **OK** button.
The alarm selected in step 3 is deleted.

Supplemental information: You can delete alarm tables even when they are active (bound to an Agent). If you delete all the alarms in an alarm table, the alarm table itself is also deleted.

Exporting Alarm Tables

To export one or more alarm tables:

1. Log in to the Tuning Manager server with a user who has the Admin (application management) permission.
2. In the global tasks bar area, choose **Go** and then **Performance Reporter**.
The main window of Performance Reporter is displayed.
3. In the Navigation frame of the Performance Reporter main window, click the **Alarms** link to open the Alarms window.
4. From the Alarms tree in the Navigation frame, select the targets to be exported.
The report is exported according to the selected target as follows:
 - If you select the root **Alarms**: All the folders and alarm tables under **Alarms** are exported.
 - If you select a folder: The selected folder and alarm tables under it are exported.
 - If you select an alarm table: The selected alarm table is exported.
5. In the Method frame, select **Export**.
6. In the Download File window, click the **Save** button.
7. In the Save As window, specify the export destination and the file name.
The target selected in step 3 is output to the file specified here.
8. Click the **Save** button to export the target selected at step 3.

Importing Alarm Tables

To import alarm tables:

1. In the Navigation frame of the Performance Reporter main window, select the **Alarms** link.

The Alarms window appears.

2. In the Method frame, select **Import**.

The Import window appears (see Figure 6-12).

3. Click the **Browse** button of **Import file name**.

The Select File window appears.

4. Select the definition file of the alarms to be imported.

The root, folders, and alarm tables included in the definition file selected here are imported.

5. Click the **OK** button.

A message box used to confirm the replacement appears.

6. If you want to replace the definition file of the alarm table, click the **OK** button in the message box.

The alarm tables are imported.



Note: If importing an alarm table overwrites an already bound alarm table, that alarm table is unbound. If necessary, rebind the alarm table to its Agent.

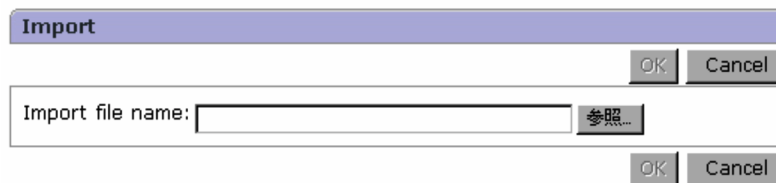


Figure 6-12 **Import Window**

Operating Alarms

This section explains how to operate alarms in the Performance Reporter window.

Associating an Alarm Table with an Agent

To enable Performance Reporter to receive alarm events from an Agent, you must associate an alarm table with the Agent. Such an association is called **binding**.

If you bind an alarm table to an Agent, all conditional expressions for each alarm in the alarm table are evaluated by the Agent, and you receive alarm notifications when those conditions are met or when the status changes back to normal.

If you modify an alarm defined in an already bound alarm table, conditional expressions are automatically evaluated by using the changed values.



Note: You can bind each alarm table to multiple Agents. However, you can bind only one alarm table to each Agent. If you bind an alarm table to an Agent that already has another alarm table bound to it, the new alarm table replaces the old one.

To bind an alarm table to an Agent:

1. Log in to the Tuning Manager server with Admin (application management) permission.
2. In the global tasks bar area, choose **Go** and then **Performance Reporter**.
The main window of Performance Reporter is displayed.
3. In the Navigation frame of the Performance Reporter main window, select the **Agents** link to open the Agents window.
4. In the **Display format** drop-down list in the Navigation frame, select **Products**.

The Agents tree, which is organized by product, appears.

5. In the Navigation frame, select the Agent to bind the alarm table to.
The selected Agent is marked with a check mark. If you select **Multiselect**, you can select multiple Agents.
6. In the Method frame, select the **Bind Alarm Table** method.
In the Information frame, the Bind Alarm Table to Agents (Select Alarm Table) window appears.
7. Select the alarm table to bind to the Agent.
The selected alarm table is marked with a check mark (see Figure 6-13). You cannot select multiple alarm tables.



Note: You can bind alarms to Agents only on an alarm table basis. You cannot bind alarms to Agents separately.

8. Click the **OK** button.

The alarm table selected in step 6 is bound to the Agent selected in step 4.

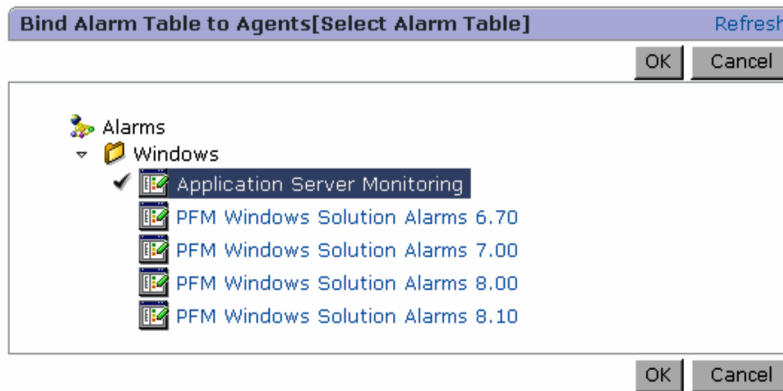


Figure 6-13 Bind Alarm Table to Agents (Select Alarm Table) Window

Unbinding an Alarm Table from an Agent

Unbinding an alarm table from an Agent stops all of the monitoring defined in the alarm table.

If you want to temporarily stop or resume evaluating an alarm without changing the alarm definition or unbinding the alarm table from the Agent, see [Stopping Monitoring with an Alarm](#) and [Starting Monitoring with an Alarm](#).

To unbind an alarm table:

1. Log in to the Tuning Manager server with a user who has the Admin (application management) permission.
The main window of the Main Console is displayed.
2. In the global tasks bar area, choose **Go** and then **Performance Reporter**.
The main window of Performance Reporter is displayed.
3. In the Navigation frame of the Performance Reporter main window, select the **Agents** link.
The Agents window appears.
4. Select **Products** from the **Display format** drop-down list in the Navigation frame.
The Agents tree, which is organized by product, appears.
5. In the Navigation frame, select the Agent to unbind the alarm table from.

The selected Agent is marked with a check mark. If you select **Multiselect**, you can select multiple Agents.

6. In the Method frame, select the **UnBind Alarm Table** method.
The message box used to confirm the unbinding of the alarm table appears.
7. If you want to unbind the alarm table, click the **OK** button in the message box.
The alarm table is unbound from the Agent selected in step 4.

Displaying the Agents Bound to an Alarm Table

You can check which Agents are bound to an alarm table.

To display the Agents bound to an alarm table:

1. From the Alarms tree in the Navigation frame, select the alarm table for which you want to display bound Agents.
2. In the Method frame, select the **Show Bound Agents** method.
A list of the Agents bound to the selected alarm table appears in the Information frame.

Stopping Monitoring with an Alarm

You can temporarily stop or start monitoring with an alarm without unbinding the alarm from its Agent.

If you want to stop the monitoring and also unbind an alarm definition from its Agent, see [Unbinding an Alarm Table from an Agent](#).

To stop monitoring with an alarm:

1. Log in to the Tuning Manager server with a user who has the Admin (application management) permission.
The main window of the Main Console is displayed.
2. In the global tasks bar area, choose **Go** and then **Performance Reporter**.
The main window of Performance Reporter is displayed.
3. In the Navigation frame of the Performance Reporter main window, select the **Alarms** link.
The Alarms window appears.
4. In the Navigation frame, select the alarm table for which to stop monitoring from the folder of the Agent.
The selected alarm table is marked with a check mark.
5. In the Method frame, select **Activate**.
The Activate window appears.
6. Change the setting of **Activate**.

Clear the **Activate** check box for the alarm for which to stop monitoring (see Figure 6-14).

- Click the **OK** button to stop monitoring with the alarm.

Alarm name	Activate
Available Memory	☐
CPU Usage	☐
Disk Space	☐

Figure 6-14 Active Setting Window

Starting Monitoring with an Alarm

You can temporarily stop or start monitoring with an alarm without unbinding the alarm from the Agent.

To start monitoring with an alarm:

- Log in to the Tuning Manager server with the Admin (application management) permission.
- In the global tasks bar area, choose **Go** and then **Performance Reporter**. The main window of Performance Reporter is displayed.
- In the Navigation frame of the Performance Reporter main window, select the **Alarms** link to open the Alarms window.
- In the Navigation frame, select the alarm table for which to start monitoring from the folder of the Agent. The selected alarm table is marked with a check mark.
- In the Method frame, select **Activate**.
- In the Activate window, change the setting of **Activate**. Check **Activate** for the alarm for which monitoring is to start (see Figure 6-15).
- Click the **OK** button to start monitoring with the alarm.

Alarm name	Activate
Available Memory	☒
CPU Usage	☒
Disk Space	☒

Figure 6-15 Active Setting Window 2

Displaying Alarm Properties (Definition Contents)

This section explains how to check alarm properties. You can check alarm properties from any of the following windows:

- The Alarms window
Here, you can check the properties of all the alarms.
- The Agents window
Here, you can check the properties of the alarms contained in an alarm table bound to an Agent.
- The Event Monitor window
Here, you can check the properties of the alarms that issued alarm events.

Only users who have the Admin (application management) permission can display alarm properties from the Alarms window.

Checking Alarms from the Alarms Window

To display alarm properties from the Alarms window:

1. In the Navigation frame of the Performance Reporter main window, select the **Alarms** link.
The Alarms window appears.
2. In the Navigation frame, select the alarm for which to display properties from the folder of the Agent.
3. In the Method frame, select **Properties**.

The Properties window appears.

Click **Main Information**, **Alarm Conditions**, **Action**, or **Action Definitions** on the menu bar to jump to the corresponding information (see Figure 6-16).

Properties

Close

Main Information

Alarm Conditions

Actions

Action Definitions

Main Information

General settings

Product:

Windows(4.0)

Alarm table name:

Application Server Monitoring

Alarm name:

Available Memory

Alarm message:

☐ Monitor whether the value exists

Advanced settings

☒ Enable alarm
 ☐ Always notify
 ☐ Evaluate all data

Monitoring time range

☒ Always monitor

Start:

End:

Damping

☐ Report alarm when the following damping condition is reached.

occurrence(s) during Interval(s)

Figure 6-16 Properties Window

Checking Alarms from the Agents Window

To display alarm properties from the Agents window:

1. In the Navigation frame of the Performance Reporter main window, select the **Agents** link.

The Agents window appears.

2. In the Navigation frame, select the Agent whose alarm properties you want to check from the Agents tree.

3. In the Method frame, click the **Display Alarm Status** method.

The Display Alarm Status window appears.

Checking Alarms from the Event Monitor Window

To display alarm properties from the Event Monitor window:

1. From the toolbar of the Performance Reporter main window, select **Event Monitor**.

The Event Monitor window appears as a separate window.

2. From the **View** drop-down list, select **Alarm events**.

The alarm events are listed.

3. Select the icon of the alarm whose properties you want to display.

The Alarm Properties window is displayed as a separate window.

Notes on Alarms

This section provides cautionary notes on alarms.

Notes on Creating Alarms

Time for Evaluating the Alarm

If monitoring conditions for multiple records are specified for an alarm and the monitoring interval and offset (start time) differ among records, the alarm is only evaluated when the collection schedules for all records match. If necessary, revise the collection interval setting.

Saving the Records to be Evaluated by the Alarm

You do not have to save the records that you selected for the alarm conditions in the Store database.

Limitation on the Number of Alarms

You can create a maximum of 50 alarms in each alarm table.

Setting an Alarm to Monitor Whether a Value Exists

If you have selected **Monitor whether the value exists**, values specified in the conditional expression do not exist in the collected data when an alarm is reported. In this case, note that even if you specify the variable `%CVS` in the message or the `Mail Subject`, the variable is replaced with an empty string.

How the Number of Alarms Affects the Number of Agent Connections

In a Tuning Manager series program, the Tuning Manager server receives the alarms issued by Agents and then handles them sequentially, for example, by storing them in a Store database (Master Store). When alarms occur frequently or are issued by many Agents at the same time, the Tuning Manager server processing might be delayed. In this case, unhandled alarms are accumulated in the memory of the Tuning Manager server host, which might cause the memory usage to increase or the system performance to degrade.

We therefore recommend that you consider how frequently an alarm will occur when you define it, to avoid exceeding the maximum number of alarm occurrences that the Tuning Manager server can handle in a particular interval of time. We also recommend that you determine the maximum number of Agents that you will allow to connect to the Tuning Manager server in advance. Note that no more than 50 Agents can be connected to one Tuning Manager server.

How the Number of Alarm Occurrences Affects System Resources

If multiple alarms for which actions are set are issued at the same time, those actions consume system resources when they are executed. This might make the system unstable.

Specifying Alarm Damping

When monitoring records whose values can fluctuate temporarily, such as CPU usage, we recommend that you specify **Damping** for **Advanced settings** of the Alarm Wizard - Main Information window.

For example, suppose you create an alarm that issues alarm events when a threshold is exceeded twice during three monitoring intervals, using the following abnormal and warning thresholds. The tables below describe when alarm events are issued.

- Abnormal threshold: CPU% > 90%
- Warning threshold: CPU% > 80%

Examples are given below.

Table 6-8 When the Abnormal Threshold Is Exceeded Twice During Three Intervals

Interval	1	2	3
CPU usage (status)	56% (normal)	95% (abnormal)	93% (abnormal)
Number of times warning threshold is exceeded	0	1	2
Number of times abnormal threshold is exceeded	0	1	2
Alarm event issued	None	None	Abnormal

In this case, an abnormal alarm event is issued after the third interval. Although the warning threshold was also exceeded twice during the three intervals, the abnormal event is issued because it has a higher severity level.

Table 6-9 When the Warning and Abnormal Thresholds Are Exceeded Once Each During Three Intervals

Interval	1	2	3
CPU usage (status)	31% (normal)	84% (warning)	93% (abnormal)
Number of times warning threshold is exceeded	0	1	2
Number of times abnormal threshold is exceeded	0	0	1
Alarm event issued	None	None	Warning

In this case, a warning alarm event is issued after the third interval. The abnormal alarm event is not issued because the abnormal threshold was exceeded only once.

Table 6-10 When the Status During the Latest Interval Is Normal but the Number of Times the Warning or Abnormal Threshold Was Exceeded Satisfied the Damping Condition

Interval	1	2	3	4
CPU usage (status)	96% (abnormal)	84% (warning)	93% (abnormal)	30% (normal)
Number of times warning threshold was exceeded during the past three intervals	1	2	3	2
Number of times abnormal threshold was exceeded during the past three intervals	1	1	2	1
Alarm event issued	None	Warning	Abnormal	None

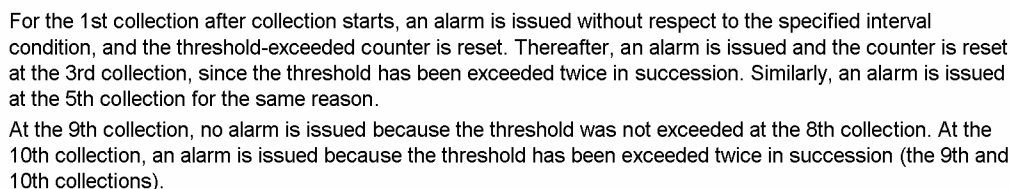
In this case, a warning alarm event is issued after the second interval, and an abnormal alarm event is issued after the third interval. If the status returned to normal, no alarm event is issued after the fourth interval. This is because, even though the warning threshold was exceeded twice during the second and third intervals, the status is neither the warning status nor the abnormal status during the fourth interval. Whether an alarm event is issued after the fifth interval depends on the status during that interval:

Status during the fifth interval

- Normal
A normal alarm event is issued.
- Warning
A warning alarm event is issued.
- Abnormal
Because the last alarm event issued was an abnormal event, no alarm event is issued.

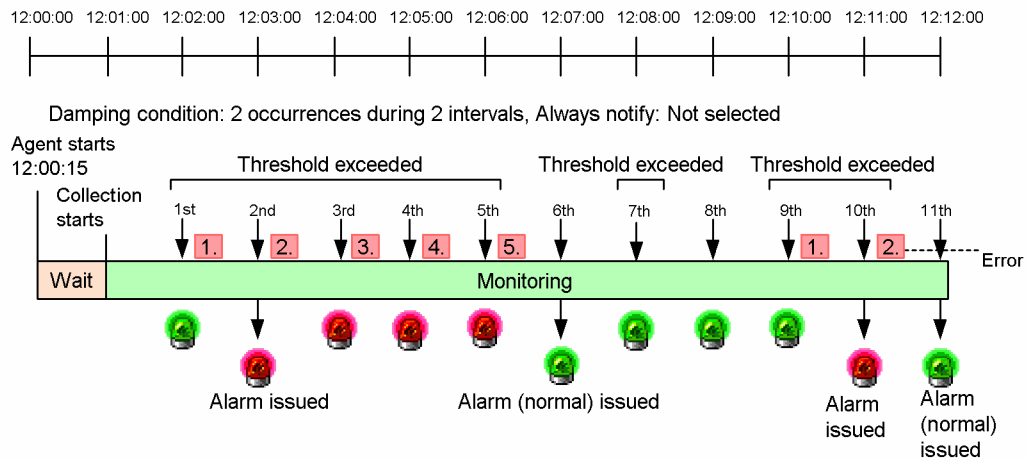
This section uses sample cases to explain the relationship between the alarm damping condition settings and the issuance of alarm events.

In this case, an alarm event is issued the first time that the threshold is exceeded. Thereafter, an alarm event is issued each time the threshold has been exceeded n times in succession. When the threshold is not exceeded before the threshold-exceeded counter has reached n , an alarm event is not issued, but when the threshold has been exceeded n times in succession again, an alarm event is issued again. The counter is also reset when an alarm is issued.



The alarm damping condition is n/n and "Always notify" is not selected

An alarm event is issued when the number of times that the threshold is exceeded during n intervals reaches n . When the threshold is not exceeded before the threshold-exceeded counter has reached n , an alarm event is not issued, but when the number of times that the threshold is exceeded during n intervals reaches n again, an alarm event is issued again. However, the counter is not reset by the occurrence of an alarm or a normal alarm.



An alarm is issued the second time that the threshold is exceeded. Since "Always notify" is not selected, the threshold-exceeded counter is not reset.

At the 3rd collection, although the threshold has been exceeded twice in succession (the 2nd and 3rd collections), no alarm is issued because the previous status was red, indicating abnormal.

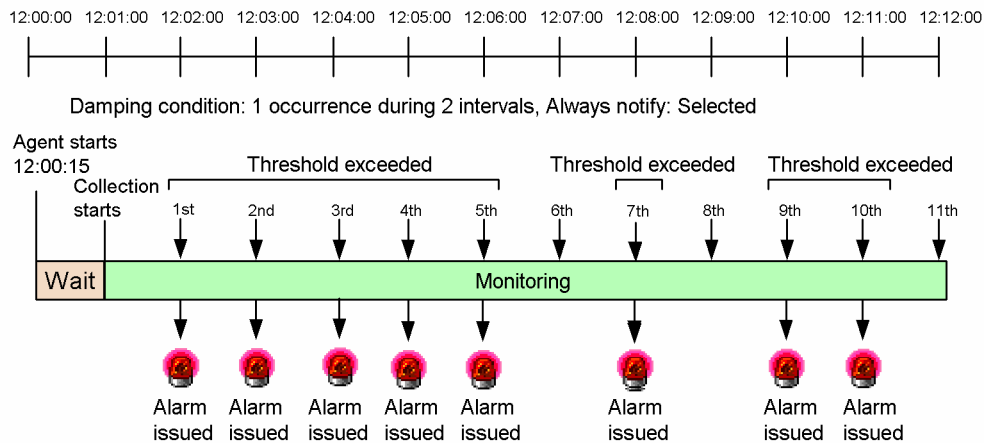
At the 6th collection, the threshold is not exceeded and a green (normal) alarm is issued, since the previous status was red (abnormal).

At the 10th collection, the threshold is again exceeded. This time, a red (error) alarm is issued because the threshold was exceeded when the status at the 9th collection was green (normal).

Figure 6-18 Alarm Event When the Alarm Damping Condition Is n/n (n = n) (the "Always notify" Option Is Not Selected)

The alarm damping condition is n/m and "Always notify" is selected

In this case, the evaluation centers on whether the number of times that the threshold has been exceeded during the last m intervals has reached n . If the data in the last data collection is normal, no alarm event is issued. When the **Always notify** option is selected, there is no normal status. Therefore, an alarm event is issued only when the data in the last data collection is at the error level or warning level. The threshold-exceeded counter is reset when an alarm is issued.



An alarm is issued the first time that the threshold is exceeded. Because the "Always notify" option is selected, the threshold-exceeded counter is reset. Thereafter, the threshold is exceeded for each collection until the 5th. In each case, an alarm is issued and the counter is reset. At the 6th collection, the threshold is not exceeded and no alarm is issued.

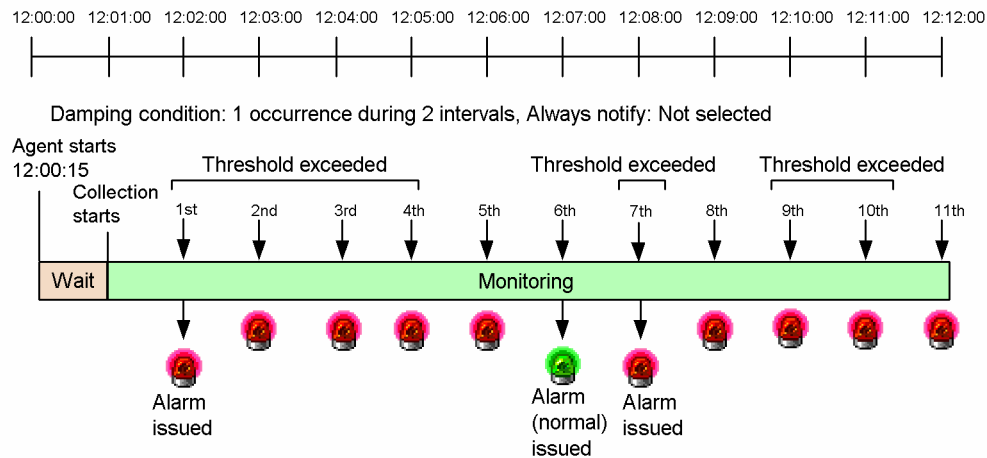
At the 7th collection, an alarm is issued because the threshold has been exceeded once during the last two intervals (the 6th and the 7th). Similarly, at the 9th collection, an alarm is issued for the same reason.

At the 10th collection, although the counter was reset at the 9th collection, an alarm is issued because the counter value has increased.

Figure 6-19 Alarm Event When the Alarm Damping Condition Is n/m ($n < m$) (the "Always notify" Option Is Selected)

The alarm damping condition is n/m and "Always notify" is not selected

In this case, evaluation centers on whether the number of times the threshold has been exceeded during the last m intervals has reached n . If the data in the last collection is normal, no alarm event is issued even when the number of times that the threshold has been exceeded during the last m intervals has reached n . In fact, the opposite occurs: The status changes to normal if the number of times that the threshold has been exceeded has not reached n . In addition, when an alarm or normal alarm is issued, the threshold-exceeded counter is not reset.



At the 1st collection, an alarm is issued because the number of times that the threshold has been exceeded is already 1. The counter is not reset because the "Always notify" option is not selected.

At the 5th collection, although the threshold has been exceeded once during the last two intervals (the 4th and the 5th), an alarm is not issued because the previous status was red, indicating abnormal.

At the 6th collection, because the threshold has not been exceeded during the last two intervals and the previous status was red (abnormal), a green (normal) alarm is issued.

At the 7th collection, because the threshold has been exceeded once during the last two intervals and the previous status was green (normal), a red (abnormal) alarm is issued.

Figure 6-20 Alarm Event When the Alarm Damping Condition Is n/m ($n < m$) (the "Always notify" Option Is Not Selected)

Notes on Evaluating Alarms

- Limitation on the number of alarm evaluations
If multi-instance records are collected by an Agent, a maximum of 32,767 instances can be handled during a collection. When alarms are bound to an Agent, a maximum of 32,767 instances are evaluated. Additional instances cannot be evaluated.
- Interval for evaluating an alarm
Alarms are evaluated at fixed intervals. This interval is different for each record of the Agent. For details on the alarm evaluation interval for each record, see the chapter explaining records (descriptions of each record) in any of the following manuals:

- *Hitachi Tuning Manager Hardware Reports Reference*
- *Hitachi Tuning Manager Operating System Reports Reference*
- *Hitachi Tuning Manager Application Reports Reference*

To modify the alarm evaluation interval, follow the procedure below:

- In the Navigation frame of the Performance Reporter main window, select the **Services** link.
 - Select the Agent that the alarm is bound to.
 - In the Method frame, select **Properties**.
 - Expand the `Detail Records` or `Interval Records` folder.
 - Change the value of the **Collection Interval** property.
 - The record (performance data) collection interval changes to the value you set.
- Differences in alarm evaluations for various combinations of alarm conditions

The details of an alarm evaluation depend on the alarm conditions and the type of record to be evaluated. The following table describes the differences among alarm evaluations for various combinations of alarm conditions.

Table 6-11 Differences among Alarm Evaluations for Various Alarm Conditions

Conditional expression	Record type	Always	All	Alarm evaluation (notification)
Monitor whether the value exists is not selected	Single-row record ^{#1}	N	N	If the abnormal condition is satisfied, and the previously reported alarm was not abnormal (red), the abnormal (red) alarm is reported.
		N	Y	- If the abnormal condition is not satisfied, but the warning condition is, and the previously reported alarm was not a warning (yellow), the warning (yellow) alarm is reported. - If neither of the above cases is satisfied, and the previously reported alarm was abnormal (red) or a warning (yellow), the normal (green) alarm is reported.
		Y	N	If either the abnormal or warning condition is satisfied, the abnormal or warning alarm is reported, regardless of any previously reported alarms.
		Y	Y	

Conditional expression	Record type	Always	All	Alarm evaluation (notification)
	Multi-row record ^{#2}	N	N	▪ If one instance is found that satisfies the abnormal condition, and the previously reported alarm was not abnormal (red), the abnormal (red) alarm is reported for that instance. ▪ If no instance is found that satisfies the abnormal condition, one instance is found that satisfies the warning condition, and the previously reported alarm was not a warning (yellow), the warning (yellow) alarm is reported for that instance. ▪ If none of the collected instances matches either of the above cases, and the previously reported alarm was abnormal (red) or a warning (yellow), the normal (green) alarm is reported. Note: As soon as any instance is found that satisfies the condition, the alarm evaluation ends. Therefore, not all of the collected instances are always evaluated.
		N	Y	▪ If, after all of the collected instances are evaluated, one or more instances are found that satisfy the abnormal condition, and the previously reported alarm was not abnormal (red), the abnormal (red) alarm is reported for each of those instances. ▪ If, after all of the collected instances are evaluated, no instance is found that satisfies the abnormal condition, one or more instances are found that satisfy the warning condition, and the previously reported alarm was not a warning (yellow), the warning (yellow) alarm is reported for each of those instances. ▪ If none of the collected instances matches either of the above cases, and the previously reported alarm was abnormal (red) or a warning (yellow), the normal (green) alarm is reported. Note: Because all of the instances are evaluated, more than one alarm might be reported during an interval.
		Y	N	▪ As soon as one instance is found that satisfies the abnormal condition, the abnormal alarm is reported based on that instance, regardless of any previously reported alarms. ▪ As soon as one instance is found that satisfies the warning condition, if no instance has been found that satisfies the abnormal condition, the warning alarm is reported based on that instance, regardless of any previously reported alarms. Note: As soon as any instance is found that satisfies the condition, the alarm evaluation ends. Therefore, not all of the collected instances are always evaluated.

Conditional expression	Record type	Always	All	Alarm evaluation (notification)
		Y	Y	For each instance that satisfies either the abnormal or warning condition, the abnormal or warning alarm is reported. Note: Because all of the instances are evaluated, more than one alarm might be reported during an interval.
Monitor whether the value exists is selected	multi-row record ^{#2}	N	N	All of the collected instances are checked to determine if values specified in conditional expressions of Alarm Wizard - The value whose existence is to be monitored exist, and, if this value is not found (the condition is not satisfied), the abnormal (red) alarm is reported.
		N	Y	Note: The alarm that notifies you of no operation is reported only once. If no instances are collected, the alarm is not evaluated.
		Y	N	All of the collected instances are checked to determine if values specified in conditional expressions or Alarm Wizard - The value whose existence is to be monitored exist, and, if this value is not found (the condition is not satisfied), the abnormal (red) alarm is reported.
		Y	Y	Note: The alarm is reported every time. If no instances are collected, the alarm is not evaluated.

Legend:

Always: Indicates whether **Always notify** is selected

All: Indicates whether **Evaluate all data** is selected

Y: Used (selected)

N: Not used (not selected)

#1

A single-row record is a single-instance record.

#2

A multi-row record is a multi-instance record.

The alarm evaluation method is explained for various alarm conditions below.

When you specify a value whose existence is to be monitored:

When you specify a value whose existence is to be monitored, all fields in the specified records of type PD or PI are evaluated to check for the specified value. If the value is not found, the alarm is reported once per interval.

When you specify alarm conditions:

When you specify alarm conditions, if the type of record to be evaluated during this alarm is PD, multiple records are collected in one interval. By default, as soon as an instance is found that satisfies the conditional expression, the alarm is reported and the evaluation ends. Therefore, not all the performance data is always evaluated. To evaluate performance data of the PD record type during an alarm, select **Evaluate all data** in **Advanced settings** of the **Alarm Wizard - Main Information** window.

- Differences among alarm evaluations that depend on damping

In addition to the differences among alarm evaluations for various alarm conditions, if you set up **Damping**, other differences are added to the alarm evaluation. The following table describes the differences among alarm evaluations for various alarm conditions when damping is specified.

Table 6-12 Differences Among Alarm Evaluations When Damping Is Specified

Damping	Always	All	Alarm evaluation (notification)
Y	N	N	▪ The alarm is reported only when the status of the alarm changes from the previously reported status. ▪ The status of the alarm is reported based on the instance that indicates the highest severity at the time of reporting. Note: Because the status of the alarm is determined by evaluating the damping condition, the status of the alarm might not match the threshold value of the reported instance.
Y	N	Y	▪ The alarm is reported only when the status of the alarm changes from the previously reported status. ▪ If the alarm has the warning or abnormal status, the status of the alarm is reported based on all of the instances that satisfy the status condition when the alarm is reported. Note: Because the status of the alarm is determined by evaluating the damping condition, the status of the alarm might not match the threshold value of the reported instance.
Y	Y	N	The instance that indicates the highest severity at the time of reporting the alarm is reported.
Y	Y	Y	All of the instances that satisfy the warning or abnormal condition at the time of reporting the alarm are reported.

Legend:

Always: Indicates whether **Always notify** is selected

All: Indicates whether **Evaluate all data** is selected

Y: Used (selected)

N: Not used (not selected)

The following table describes the differences in when alarms are reported.

Table 6-13 The Timing of Alarm Notification

Damping	When the alarm is reported
n/m	The alarm is reported when the threshold is exceeded n times during m intervals. Subsequently, the alarm is reported every time the threshold is exceeded n times during m evaluations of the alarm.
n/n (See Note)	The alarm is reported every n times the threshold is exceeded. This is useful, for example, when you do not want threshold-exceeded alarms to be reported successively.



Note: If **Always notify** is selected and the threshold is exceeded at the first collection, an alarm will be issued regardless of the interval.

Notes on Operation

An Agent started in stand-alone mode cannot monitor performance data with alarms or execute actions for alarm events.

If the Tuning Manager server or the Action Handler service at the connection destination is stopped, the Agent cannot execute actions. If you want actions to be executed, make sure that the Tuning Manager server or the Action Handler service at the connection destination is running.

Monitoring Agents

When using Tuning Manager series programs, the stable operation of Agents, which collect and manage performance data from the monitored targets, is necessary. You can use Performance Reporter to remotely monitor the operating statuses of Agents.

This chapter describes how to monitor operations of each Agent by using Performance Reporter.

Note that the operating procedures described in this chapter assume that the Performance Reporter main window is displayed. For details on how to start Performance Reporter, see [Launching Performance Reporter](#).

- [Monitoring by Using the Agents Tree](#)
- [Monitoring Agent Operations](#)

Monitoring by Using the Agents Tree

You can monitor Agent operations in the Agents window of Performance Reporter. The Agents window displays the Agent products connected to the Tuning Manager server by using a tree-like arrangement. In this window, you can check the operating statuses of Agents by using their icons.

The following figure shows an example of the Agents window of Performance Reporter.

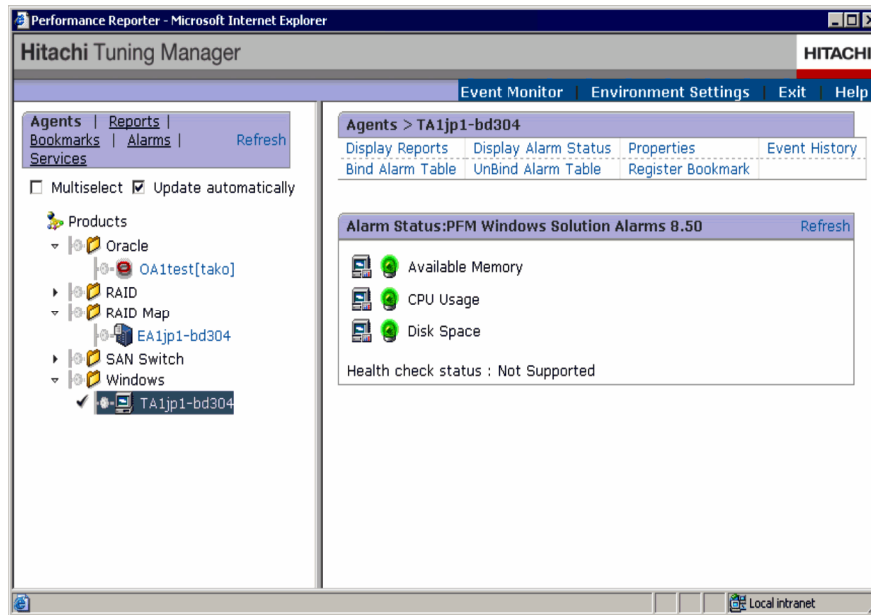


Figure 7-1 Example of the Agents Window

The icons in the Agents tree that appear in the Navigation frame on the left side of the window indicate the operating status of each Agent. You can display related reports and check the alarm status and event history by selecting an Agent in the Agents tree.

The items in the Agents tree are grouped on an Agent basis by using folders.

The following table describes the components of the Agents tree.

Table 7-1 Components of the Agents Tree

Component	Description
Root ()	This indicates a root node of the Agents tree. The root appears with the name Products . You cannot change the root name.

Component	Description
Folder ()	This component is used to categorize Agents.
Agent ()	This indicates Agents connected to the Tuning Manager server. Names of Agents appear as service IDs. For details on service IDs, see the <i>Hitachi Tuning Manager Agent Administration Guide</i>.

Supplemental information: Agents that are not registered in the Tuning Manager server system are stored in the **Unknown** folder. For details on how to register Agents, see the *Hitachi Tuning Manager Installation Guide*.

Monitoring Agent Operations

You can check the status of each Agent by clicking its icon in the Agents tree displayed in the Navigation frame of the Agents window.

In addition to monitoring, the following operations are available for any Agents selected in the Agents tree:

- Displaying the status of alarms
- Displaying related reports
- Displaying event history
- Displaying properties

Each procedure is described below.

Checking Statuses of Agents

You can check statuses of Agents by clicking their icons in the Agents tree displayed in the Navigation frame of the Agents window.

To check the statuses of Agents:

1. In the Navigation frame of the Performance Reporter main window, click the **Agents** link.

The Agents window appears.

2. Check the icons displayed in the Agents tree.

The following tables describe the statuses indicated by the folder or Agent icons:

Table 7-2 Statuses Indicated by Folder Icons

Icon	Description
	This icon indicates that all Agents in the folder are normal.
	This icon indicates that at least one Agent in the folder has the warning status.
	This icon indicates that at least one Agent in the folder has the abnormal status.
	This icon indicates the operating statuses of the Agents in the folder. [#]



Note: The folder icon indicates the most severe status level among those of the Agents in the folder. The severity levels, starting from the most severe, are abnormal, warning, and normal.

For a description of the icons that indicate the health check statuses, see Table 7-4.

Table 7-3 Statuses Indicated by Agent Icons

Icon	Description
	This icon indicates the normal or not started status (status unknown).
	This icon indicates the warning status.
	This icon indicates the abnormal status.
	This icon indicates the operating status of the Agent. #

For a description of the icons that indicate the health check statuses, see Table 7-4.

Table 7-4 Health Check Statuses Indicated by Icons

Icon	Description
	Not Supported#
	Running#
	Incomplete#
	Stopped#
	Unconfirmed#
	Host Not Available#

For details on the status indicated by each health check event icon, see the *Hitachi Tuning Manager Agent Administration Guide*.

Checking the Status of Alarms

You can check the status of alarms defined in the alarm tables bound to each Agent. You can also display reports that are bound to alarms.



Note: You cannot display the status of alarms if no alarm table is bound to the Agent. For details on how to bind an alarm table to an Agent, see [Associating an Alarm Table with an Agent](#).

To check the status of alarms:

1. In the Navigation frame of the Performance Reporter main window, choose the **Agents** link.

The Agents window appears.

2. In the Agents tree of the Navigation frame, select the Agent for which you want to check the alarm status.

The selected Agent is marked with a check mark.

3. Select the **Display Alarm Status** method in the Method frame.

The Alarm Status window appears.

A list of alarms appears that displays alarms defined in the alarm table that is bound to the Agent selected in step 2.

You can check the status of alarms by examining the colors of the alarm icons.

The status of alarms indicated by icon colors are as follows:

-  (green): This color indicates the normal status.
-  (yellow): This color indicates the warning status.
-  (red): This color indicates the abnormal status.
- : Always displays, regardless of the alarm status. It applies only when **Always notify** is selected in the alarm definition.



Note: The color of an alarm icon changes based on the thresholds and other conditions that you specify in the Alarms window. For details on these settings, see [Setting Alarms](#) or the *Hitachi Tuning Manager Agent Administration Guide*.

Report icons (for example, ) appear to the left of alarms if you have bound a report to the alarms. Click the report icon to display related reports.

For details about binding reports to alarms, see [Associating an Alarm Table with an Agent](#).

A message indicating the health check status also appears. For status details, see the *Hitachi Tuning Manager Agent Administration Guide*.

Displaying Reports

Items that display the performance data collected in each Agent in graphical formats, such as graphs and tables, are called **reports**. You can display various reports for each Agent in the Agents window of Performance Reporter.

Templates, called **solution sets**, are available for reports to be displayed, and you can also create your own reports for any purpose. For details about displaying and creating reports, see [Working with Reports from Performance Reporter](#) or [Customizing Reports](#).

Displaying Event History

You can view histories of the following types of events that occurred in the Tuning Manager server system:

- Agent events: Events that indicate changes in Agent status
- Alarm events: Events that indicate alarms that occurred in Agents
- Health check events: Events that indicate changes in the health check status of Agents

You can check the event history for each Agent in the Event History window. You can also output event history data to a text file in CSV or HTML format. For details, see [Displaying the Event History](#).

Displaying Agent Properties

You can display the properties of each Agent (Agent Collector service) to view settings such as those for data collection intervals and collecting conditions. You cannot change these property settings.

To check Agent properties:

1. In the Navigation frame of the Performance Reporter main window, click the **Agents** link to open the Agents window.
2. In the Agents tree of the Navigation frame, select the Agent whose properties you want to display.

The selected Agent is marked with a check mark.

3. In the Method frame, choose the **Properties** method.

The Service Properties window appears.

This tree appears at the top of the Information frame. The properties of the node selected in the tree appear at the bottom of the Information frame, allowing you to view the settings for data collection intervals and conditions.

Displayed property settings differ depending on Agents. For details on property settings, see the appendix in the *Hitachi Tuning Manager Agent Administration Guide*.

Displaying Events

This chapter describes how to use Performance Reporter to display events issued by Agents.

Note that the operating procedures described in this chapter assume that the Performance Reporter main window is displayed. For details on how to start Performance Reporter, see [Launching Performance Reporter](#).

- [Displaying the Latest Events](#)
- [Displaying the Event History](#)
- [Outputting the Event History](#)

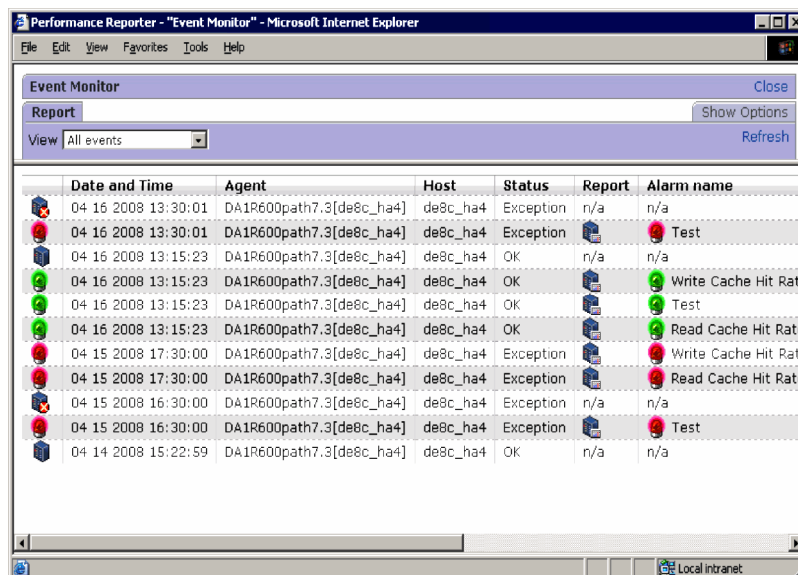
Displaying the Latest Events

You can check the latest events information in the Event Monitor window of Performance Reporter. In this window, you can check the following three types of event information:

- Agent events
Events that indicate changes in Agent status
- Alarm events
Events that indicate alarms that occurred in Agents
- Health check events
Events issued in response to changes in the health check status

In the Event Monitor window, you can monitor the status changes of Agents in real time because the display information is periodically updated automatically. You can also set the display conditions to display only events that occurred in specific Agents and color code events according to their status.

The following figure shows an example of a displayed Event Monitor window.



Date and Time	Agent	Host	Status	Report	Alarm name
04 16 2008 13:30:01	DA1R600path7.3[de8c_ha4]	de8c_ha4	Exception	n/a	n/a
04 16 2008 13:30:01	DA1R600path7.3[de8c_ha4]	de8c_ha4	Exception		Test
04 16 2008 13:15:23	DA1R600path7.3[de8c_ha4]	de8c_ha4	OK	n/a	n/a
04 16 2008 13:15:23	DA1R600path7.3[de8c_ha4]	de8c_ha4	OK		Write Cache Hit Rate
04 16 2008 13:15:23	DA1R600path7.3[de8c_ha4]	de8c_ha4	OK		Test
04 16 2008 13:15:23	DA1R600path7.3[de8c_ha4]	de8c_ha4	OK		Read Cache Hit Rate
04 15 2008 17:30:00	DA1R600path7.3[de8c_ha4]	de8c_ha4	Exception		Write Cache Hit Rate
04 15 2008 17:30:00	DA1R600path7.3[de8c_ha4]	de8c_ha4	Exception		Read Cache Hit Rate
04 15 2008 16:30:00	DA1R600path7.3[de8c_ha4]	de8c_ha4	Exception	n/a	n/a
04 15 2008 16:30:00	DA1R600path7.3[de8c_ha4]	de8c_ha4	Exception		Test
04 14 2008 15:22:59	DA1R600path7.3[de8c_ha4]	de8c_ha4	OK	n/a	n/a

Figure 8-1 Example of the Event Monitor Window

Displaying the Latest Events Information

Events are listed in chronological order in the Event Monitor window.

To check the latest events information in the Event Monitor window:

1. From the Menu-bar frame of the Performance Reporter main window, select **Event Monitor**.

The Event Monitor window appears as a separate window.

2. From the **View** menu in the Event Monitor window, select an event type you want to display.

Select the type of event you want to display in the Event Monitor window from among the following five items:

- **All events**
- **Agent events**
- **Alarm events**
- **Health check events**
- **health check statuses**

The default is **All events**.

Selecting an event type lists the appropriate events. However, when you select **health check statuses**, only the icon, Agent, host name, and status are displayed (see Figure 8-2).

The following table describes the items displayed in the Event Monitor window.

Table 8-1 Display Items of the Event Monitor Window

Display Item	Description
Agent event	These events indicate the status of Agents. They are issued when the status of the Agent bound to the alarm table changes. The meanings of the icons are shown below. These meanings change depending on the Agent type. ▪ : Normal or not started status (unknown status) ▪ : Warning status ▪ : Abnormal status Note: If you select Always notify in the alarm definition, no Agent events are issued, because the status changes of Agents are not monitored.

Display Item	Description
Alarm event	These events indicate the occurrence of alarms. They are issued when a warning or abnormal threshold is reached. The meanings of the icon colors are as follows:  (green): Normal status  (yellow): Warning status  (red): Abnormal status  #: Warning or abnormal status
Health check event	These events are issued in response to changes in the health check status. The meanings of the icons are as follows:  : Not Supported  : Running  : Incomplete  : Stopped  : Unconfirmed  : Host Not Available
Date and Time	This item displays the system time of the Agent that issued the event, in the format corresponding to the locale. For details, see the <i>Hitachi Tuning Manager Server Administration Guide</i> .
Agent	This item displays the service ID of the Agent that issued the event.
Host	This item displays the operating host name of the Agent that issued the event.
Status	The meanings of the statuses are as follows: For Agent events and alarm events: - OK: Normal - Exception: Abnormal - Warning: Warning - Inactive: Not started or an unknown status For health check events and health check statuses: - Not Supported: The Agent does not support the health check function. - Running: The services of the Agent are running normally. - Incomplete: Some functionality of the Agent is unavailable. - Stopped: The services of the Agent have stopped. - Unconfirmed: The health check function cannot confirm the status of the host. - Host Not Available: The host has stopped.

Display Item	Description
Report	This item indicates whether a report associated with an event exists. - n/a: Reports about Agent events do not exist. –: Reports about alarm events do not exist : Reports exist (in Windows). : Reports exist (in UNIX).
Alarm name	This item displays the icons and detected alarm names:  (green): Normal event  (yellow): Warning event  (red): Abnormal event  #: Abnormal or warning event n/a is displayed for Agent events and health check events. If you click the icon, the Alarm Properties window is displayed, and you can check the contents of the alarm definition.
Alarm table	This item displays the detected alarm table name. n/a is displayed for Agent events and health check events.
Message	For Agent events: The messages output from Agents are displayed. The main messages that are displayed are as follows: - Startup: The Agent product has started. - Shutdown: The Agent product has stopped. - State change: The state of the Agent product has changed. - Heartbeat timeout: The Agent Collector service has changed to the busy or stop state. - Heartbeat detected: The Agent Collector service has recovered from the busy or stop state. When Heartbeat timeout is displayed, check the state of the Agent product. When other messages are displayed, no actions are required, because no messages indicate abnormality.

Display Item	Description
Message (continued)	For alarm events: The message text specified in the alarm wizard is displayed. The main messages that are displayed are as follows: - Alarm updated/deleted: The alarm definition has been updated or deleted. - Alarm deactivated: The alarm has changed to the inactive state. - Alarm cleared: The alarm was unbound. - Alarm expired: The current time exceeded the alarm evaluation time range. - Heartbeat timeout: The Agent Collector service has changed to the busy or stop state. - Heartbeat detected: The Agent Collector service has recovered from the busy or stop state. For health check events: The message text is displayed in the format <code>HC: health-check-status</code>. This area displays message text describing the status of the Agent, followed by the status of the service. For details on the display conventions for message text and examples of messages, see the <i>Hitachi Tuning Manager Agent Administration Guide</i>.

The message is displayed only when you select **Always notify** in the alarm definition.

Multi-instance records operate as follows:

- When any value at the warning or abnormal level is detected in a target instance:

The user-defined message specified in the alarm definition is displayed in the message text. Additionally, the instance value for which a value over the threshold was detected is displayed if the measured value of the performance data is specified to be displayed in the message text.

- When conditions return to normal from the abnormal or warning level:

Although normal events are issued, nothing is displayed in the message text because all the instance values become normal and the value that caused the event to occur is not determined.

3. Click **Close** on the upper right of the window to close the window.

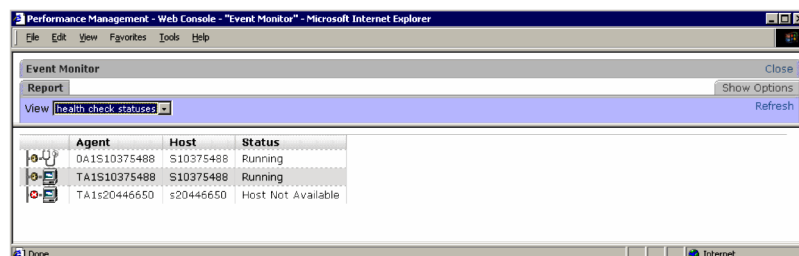


Figure 8-2 Example of the Event Monitor Window with "Health Check Status" Selected

Displaying a Report Associated with an Alarm

If an alarm event is issued within the system of a Tuning Manager series program, the report associated with the alarm can be displayed from the Event Monitor window.

To display a report associated with an alarm:

1. From the Menu-bar frame of the Performance Reporter main window, select **Event Monitor**.

The Event Monitor window appears as a separate window. If a report associated with an alarm exists, the report icon (in the case of Agent for Platform,  or ) is displayed in the **Report** column.

2. Click the report icon of the event whose report you want to display.

The alarm report window appears as a separate window. To close the report window or the Event Monitor window, click the **Close** button on the upper right of that window.

Displaying Alarm Properties

In the Event Monitor window, you can click the icon for an alarm event (the Alarm icon) to display the Alarm Properties window.

In the Alarm Properties window, you can check the contents of the alarm definition bound to the Agent in which the alarm event, which is displayed in the Event Monitor window, occurred.

To display alarm properties:

1. From the Menu-bar frame of the Performance Monitor main window, select **Event Monitor**.

The Event Monitor window appears as a separate window.

2. From the **View** menu of the Event Monitor window, select **Alarm events**.
3. Click the alarm icon for an alarm event.

The Alarm Properties window appears as a separate window, so you can check the contents of the alarm definition (see Figure 8-3). By selecting one of the following items, you can jump to the view area for the corresponding settings:

Main Information

Jump to the view area for the main information.

Alarm Conditions

Jump to the view area for the alarm conditions.

Actions

Jump to the view area for the settings of the action to be executed.

Action Definitions

Jump to the view area for the action definitions.

If you want to close the Alarm Properties window or the Event Monitor window, click the **Close** button on the upper right of that window.



Note: Users who have the Admin (application management) permissions can also display the Alarm Properties window from the Alarms window. For details on how to check the alarm properties from the Alarms window, see [Displaying Alarm Properties \(Definition Contents\)](#).

Properties Close

Main Information Alarm Conditions Actions Action Definitions

Main Information

General settings

Product: Windows(3.0)

Alarm table name: Application Server Monitoring

Alarm name: CPU Usage

Alarm message: CPU is at %CVS% utilization

☐ Monitor whether the value exists

Advanced settings

☒ Enable alarm ☐ Always notify ☐ Evaluate all data

Monitoring time range

☒ Always monitor

Start:

End:

Damping

☒ Report alarm when the following damping condition is reached.

occurrence(s) during Interval(s)

Figure 8-3 Example of the Properties Window

Specifying the Display Conditions for the Event Monitor Window

You can specify the display conditions for the Event Monitor window, such as the event display period and the maximum number of events to display.

To specify the display conditions:

1. From the Menu-bar frame of the Performance Reporter main window, select **Event Monitor**.

The Event Monitor window appears as a separate window (with the window for the **Report** tab displayed).

2. Click the **Show Options** tab in the Event Monitor window.

The **Show Options** window for this tab appears (see Figure 8-4).

3. Specify the display conditions.

Specify display conditions for the following items, if necessary:

Filter Settings

If you want to display events that occurred in all the Agents, select **Display all agents**. This is selected by default.

If you want to display only the events of specific Agents, clear **Display all agents**, and then use the move buttons (/) to move the Agents for which events are to be displayed into **Visible agents** and to move those for which they are not to be displayed into **Hidden agents**.

Note that, if you clear **Display all agents**, no events will be displayed unless you specify at least one Agent in **Visible agents**.

Color Settings

You can color code the events to be displayed in the Event Monitor window according to their status (normal, warning, or abnormal). By default, **Event color scheme** is set to **None** (no events are color coded).

When you color code the events, select the color (**Pastel colors** or **Bright colors**) to be used from the **Event color scheme** drop-down list.

Event Settings

You can specify the maximum number of events (records) to be displayed in the Event Monitor window. To specify this value, enter an integer from 1 to 999 in **Maximum number of events to display**. The default is 256.

4. Click the **OK** button.

Check the settings, and then return to the window for the **Report** tab. In this window, events are displayed according to the display conditions that were specified.



Note: The display conditions specified during this operation are available only during the current session. When you log off, the settings for the display conditions are not saved. They are reset to their initial values.

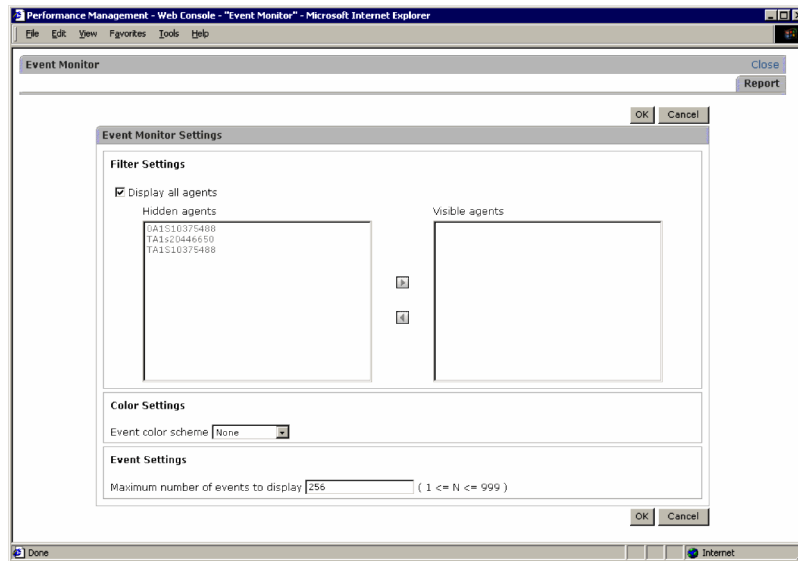


Figure 8-4 Example of the Event Monitor Window (the Show Options Tab)

Displaying the Event History

The information on previous events that occurred in a Tuning Manager server system can be checked from the Event History window of Performance Reporter.

The Event History window is displayed on a per Agent basis. You can filter the information displayed in the Event History window by specifying the date range for the data, an alarm name, the maximum number of records, and so on.

Displaying the Event History

To check the information on previous events that occurred in a Tuning Manager server system:

1. In the Navigation frame of the Performance Reporter main window, select the **Agents** link.

The Agents window appears.

2. In the Navigation frame of the Agents window, select the Agent whose event history you want to display.

If you want to select more than one Agent, select **Multiselect**. Selected Agents are marked with check marks.



Note: If you do not select an Agent, the histories of events that occurred in all the Agents are displayed.

3. In the Method frame of the Agents window, select the **Event History** method.

The Event History window appears as a separate window (with the window for the **Show Options** tab displayed) (see Figure 8-5).

4. Specify the individual items in **Settings for the report display period**.

Specify display conditions for the following items, if necessary:

Date range

To specify the date range for the data you want to display as an event history, select the appropriate range from the **Date range** drop-down list. You can select the following values:

- **Specify when displayed**
- **Within the past hour**
- **Within the past 24 hours**
- **Within the past 7 days**
- **Within the past month**
- **Within the past year**

The default is **Within the past 24 hours**.

When you select something other than **Specify when displayed**, the dates and times corresponding to the **Start time** and **End time** are automatically set.

Start time and End time

If you select **Specify when displayed** in **Date range**, specify the **Start time** and **End time** of the date range for displaying the event.

Specify the **Start time** and **End time** in a display format corresponding to the locale. For details, see the explanation of the format of the date to be specified in the initialization settings file (`config.xml`) in the *Hitachi Tuning Manager Server Administration Guide*.

The range of dates and times you can specify is from 1971/01/01 00:00 to 2035/12/31 23:59. For the **End time**, you should specify a date and time that follow the **Start time** you specified.

Note that, when you select something other than **Specify when displayed**, the appropriate date and time are automatically set. Additionally, if you change the date and time that are displayed automatically, the setting for the **Date range** changes to **Specify when displayed**.

5. Specify the **Maximum number of records**.

Specify the display conditions for the following items, if necessary:

Maximum number of records

The maximum number of events to be displayed as an event history in the window for the **Report** tab can be any integer from 1 to 1440. The default is 1000.

Additionally, in the initialization settings file (`config.xml`) of Performance Reporter, you can specify the maximum number of records (`maxFetchCount`) by using a value from 1 to 2147483647. In this case, you can specify the maximum number of records within the range of values you specified in the `config.xml` file.

6. Specify the items in **Filter**.

Specify the display conditions for the following items, if necessary:

Alarm Name

The alarm name of an event to be displayed can be a maximum of 2,048 bytes of characters. Specifying an alarm name in this item enables events during which the alarm occurs to be displayed.

By default, asterisks (*) are wildcards.

Alarm Table

An alarm table name of an event to be displayed can be a maximum of 2,048 bytes of characters. Specifying an alarm table name in this item enables you to display events that occurred and that are for alarms of the alarm table.

By default, asterisks (*) are wildcards.

Message

The string included in the text of a message can be a maximum of 2,048 bytes of characters. Specifying a string in this item enables you to display events that output a message text that contains the string.

By default, asterisks (*) are wildcards.

7. Click the **OK** button.

The Event History window appears (with the window for the **Report** tab displayed) (see Figure 8-6). Table 8-2 describes the items displayed in the Event History window.

Table 8-2 Display Items of the Event History Window

Display Items	Description
Date and Time	This item displays the system date and time of the Agent host that issued the event in the format corresponding to the locale. For details, see the <i>Hitachi Tuning Manager Server Administration Guide</i> .
Agent	This item displays the service ID of the Agent that issued the event.
Host	This item displays the operating host name of the Agent that issued the event.
StateEx	The meanings of the statuses are as follows: For Agent events and alarm events: ▪ OK: Normal ▪ Exception: Abnormal ▪ Warning: Warning ▪ Inactive: Not started or an unknown status For health check events: ▪ Not Supported: The Agent does not support the health check function. ▪ Running: The services of the Agent are running normally. ▪ Incomplete: Some functionality of the Agent is unavailable. ▪ Stopped: The services of the Agent have stopped. ▪ Unconfirmed: The health check function cannot confirm the status of the host. ▪ Host Not Available: The host has stopped.
Alarm Name	This item displays the alarm names of the event source.
Alarm Table	This item displays the alarm table name of the event source.
Message	For Agent events: The main messages that are displayed are as follows: - Startup: The Agent product has started. - Shutdown: The Agent product has stopped. - State change: The state of the Agent product has changed. - Startup: The Agent service was started. - Shutdown: The Agent service was stopped. - State change: The state of the Agent product has changed. - Heartbeat timeout: The Agent Collector service has changed to the busy or stop state.

Display Items	Description
Message (continued)	- Heartbeat detected: The Agent Collector service has recovered from the busy or stop state. If Heartbeat timeout is displayed, check the state of the Agent product. If another message is displayed, no action is required because the message does not indicate an abnormality. For alarm events: The message text specified in the alarm wizard is displayed. The main messages that are displayed are as follows: - Alarm updated/deleted: The alarm definition has been updated or deleted. - Alarm deactivated: The alarm has changed to the inactive state. - Alarm cleared: The alarm was unbound. - Alarm expired: The current time exceeded the alarm evaluation time range. - Heartbeat timeout: The Agent Collector service has changed to the busy or stop state. - Heartbeat detected: The Agent Collector service has recovered from the busy or stop state. For health check events: The message text is displayed in the format HC: <i>health-check-status</i>. This area also displays message text describing the status of the Agent, followed by the status of the service. For details on the display conventions for message text and examples of messages, see the <i>Hitachi Tuning Manager Agent Administration Guide</i>.

Multi-instance records operate as follows:

- When any value at the warning or abnormal level is detected in a target instance:

The user-defined message specified in the alarm definition is displayed in the message text. Additionally, the instance value for which a value over the threshold was detected is displayed if the measured value of the performance data is specified to be displayed in the message text.

- When conditions return to normal from the abnormal or warning level:

Although normal events are issued, nothing is displayed in the message text because all the instance values become normal and the value that caused the event to occur is not determined.

8. Click **Close** on the upper right of the window to close it.

The Event History window closes.

Supplemental information:

- If no displayable events exist, a message indicating this fact is displayed.
- The display conditions specified during this operation are available only while the Event History window is displayed. The settings are not saved.



Note: If the number of records exceeds the maximum allowed number of records, only the maximum number of records are displayed, starting with the oldest one.

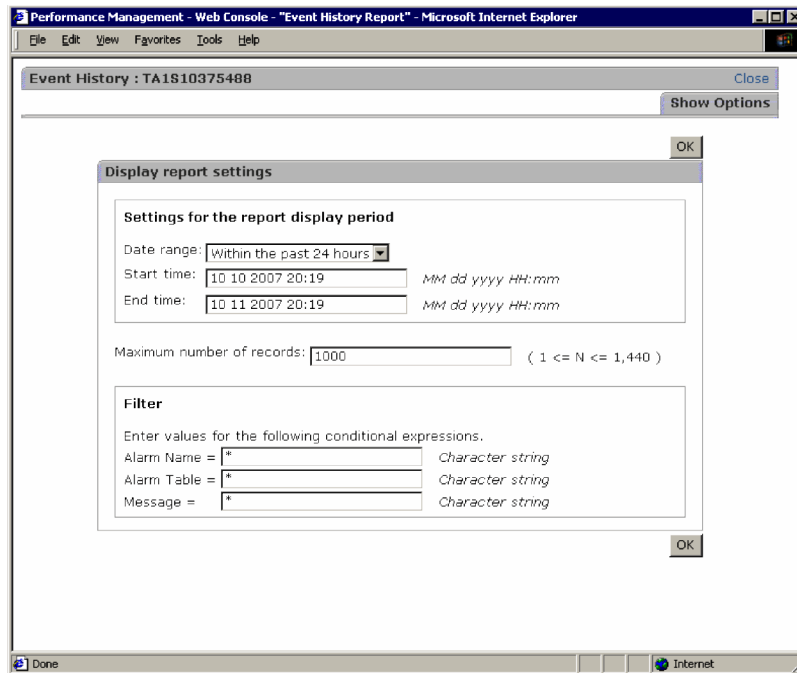


Figure 8-5 Example of the Event History Window (the Show Options Tab)

Date and Time	Agent	Host	StateEx	Alarm Name	Alarm Table
10 11 2007 20:16:00	TA1S10375488	S10375488	OK	n/a	n/a
10 11 2007 20:16:00	TA1S10375488	S10375488	OK	CPU Usage	Application Server Monitoring
10 11 2007 20:14:00	TA1S10375488	S10375488	Exception	n/a	n/a
10 11 2007 20:14:00	TA1S10375488	S10375488	Exception	CPU Usage	Application Server Monitoring
10 11 2007 20:11:00	TA1S10375488	S10375488	OK	n/a	n/a
10 11 2007 20:11:00	TA1S10375488	S10375488	OK	CPU Usage	Application Server Monitoring
10 11 2007 18:41:00	TA1S10375488	S10375488	Exception	n/a	n/a
10 11 2007 18:41:00	TA1S10375488	S10375488	Exception	CPU Usage	Application Server Monitoring
10 11 2007 18:39:00	TA1S10375400	S10375400	OK	n/a	n/a
10 11 2007 18:39:00	TA1S10375488	S10375488	OK	CPU Usage	Application Server Monitoring
10 11 2007 17:38:01	TA1S10375488	S10375488	Exception	n/a	n/a
10 11 2007 17:38:01	TA1S10375488	S10375488	Exception	CPU Usage	Application Server Monitoring
10 11 2007 15:39:00	TA1S10375488	S10375488	OK	n/a	n/a
10 11 2007 15:39:00	TA1S10375488	S10375488	OK	CPU Usage	Application Server Monitoring
10 11 2007 15:22:00	TA1S10375488	S10375488	Exception	n/a	n/a
10 11 2007 15:22:00	TA1S10375488	S10375488	Exception	CPU Usage	Application Server Monitoring
10 11 2007 10:45:31	TA1S10375488	S10375488	Running	n/a	n/a
10 11 2007 10:41:10	TA1S10375488	S10375488	OK	n/a	n/a
10 11 2007 09:50:08	TA1S10375488	S10375488	Running	n/a	n/a
10 11 2007 09:48:53	TA1S10375488	S10375488	OK	n/a	n/a

Figure 8-6 Example of the Event History Window

Outputting the Event History

This section describes how to output the event history in CSV or HTML format.

Outputting the Event History in CSV Format

To output event history data to a text file in CSV format:

1. In the Navigation frame of the Performance Reporter main window, select the **Agents** link to open the Agents window.
2. From the Navigation frame in the Agents window, select an Agent whose data you want to output in CSV format.

To select more than one Agent, select **Multiselect**. Selected Agents are marked with check marks.



Note: If you do not select an Agent, the histories of events that occurred in all the Agents are displayed.

3. In the Method frame of the Agents window, select the **Event History** method.
4. From the Event History window, select **Export** on the menu bar.
5. From the output destination dialog box, specify where the file is to be saved and the file name, and then click the **Save** button.

The event history data is output to the file.

Outputting the Event History in HTML Format

You can display event history data in a print-ready or file save format.

To output event history data in HTML format:

1. In the Navigation frame of the Performance Reporter main window, select the **Agents** link to open the Agents window.
2. From the Navigation frame in the Agents window, select an Agent whose data you want to output in HTML format.

To select more than one Agent, select **Multiselect**. Selected Agents are marked with check marks.



Note: If you do not select an Agent, the histories of events that occurred in all the Agents are displayed.

3. In the Method frame of the Agents window, select the **Event History** method.
4. From the Event History window, select **Print** on the menu bar.
5. Print or save the report by using your browser. When you save the report, use the option that saves the complete Web page.

Analyzing a Performance Bottleneck

This chapter describes how to analyze performance bottlenecks by using Tuning Manager server reports, and it provides an example analysis procedure.

- [Reviewing Key Points for Analyzing Performance Bottlenecks](#)
- [Example Analysis Procedure](#)

Reviewing Key Points for Analyzing Performance Bottlenecks

An environment that is integrated by storage consolidation contains many servers and storage subsystems, which can present challenges when identifying performance bottlenecks. For example, it can be difficult to determine which servers use particular storage and which ports are shared by certain servers. However, by understanding the relationship between the configuration of a monitored system and the analysis procedure and procedure policies, you can successfully use the Tuning Manager server to identify and troubleshoot performance degradation.

Understanding the Relationship Between the System Configuration and the Analysis Procedure

You can only analyze performance information if you understand the configuration of the system that you are monitoring. To illustrate, Figure 9-1 provides an example system configuration that a Tuning Manager server is monitoring.

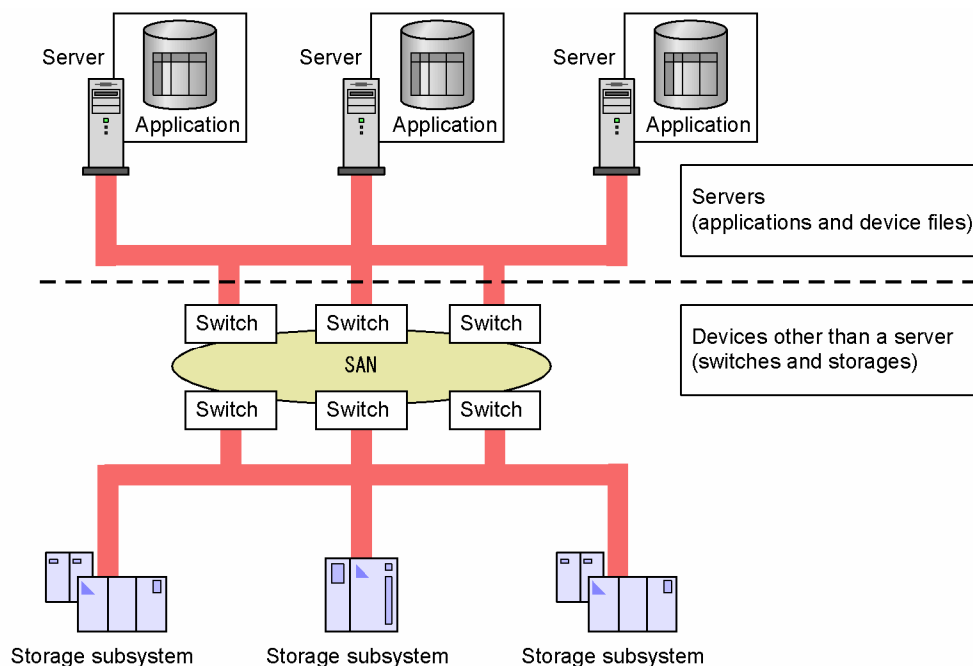


Figure 9-1 Example System Configuration that Is Monitored by a Tuning Manager Server

Typically, the locations where performance bottlenecks occur fall into two basic categories:

- Servers (on which applications and device files, for example, are installed)
- Devices other than a server (switches and storage subsystems, for example)

If a performance bottleneck occurs in one of your applications, analyze the performance information in the following order:

1. Analyze the performance information for the server on which the application is running.

If you find the cause of the performance bottleneck, the analysis ends. If you do not find the cause, you can assume that the cause is a device other than a server.

2. Analyze the performance information related to the storage subsystems that the application uses.

Analyze each item of storage-related performance information for the storage port and array group until you are able to determine the cause of the performance bottleneck.

For details on key points for analyzing performance bottlenecks and the analysis procedure, see Table 9-1.

Analysis Procedure Considerations

In performance bottleneck analysis, it is important to determine the order in which resources should be analyzed. Figure 9-2 shows the resources to which performance bottleneck analysis can be applied.

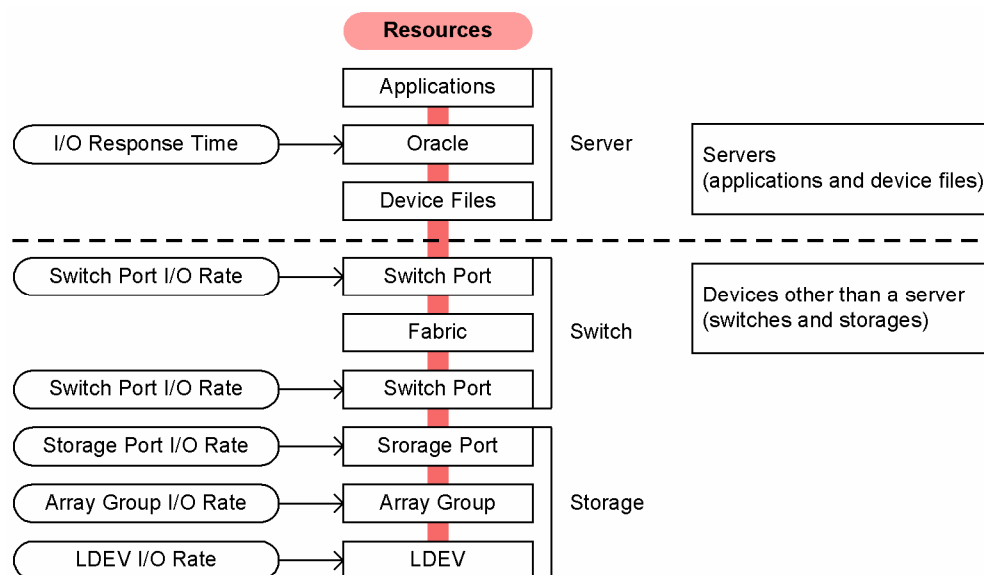


Figure 9-2 Resources to which Performance Bottleneck Analysis Can Be Applied

Table 9-1 describes performance bottleneck analysis policies and the corresponding analysis procedures.

Table 9-1 Guidelines for Analyzing a Performance Bottleneck

Guideline	Procedure		Location
Check whether the performance bottleneck is occurring on a server: 1. Check the server on which the application is running. 2. Check the resources, other than the server, used by the application. Also, use the I/O performance having the most effect on application performance to determine the cause.	1	Display a list of device files used by the server on which the application is running.	Identify the Host Name Based on the Oracle Instance Check the I/O Response Time
	2	Check the I/O performance (especially I/O Response Time) for all the device files used by the server. Determine the condition by checking the I/O performance. You can assume that a performance bottleneck occurred on a server in the following cases: ▪ A value changed rapidly. ▪ When viewed relatively, a value is extremely high.	
If you do not find any performance bottlenecks on the servers, continue by checking other locations. Because storage ports shared by multiple servers are subject to performance bottlenecks, check storage ports. For this check, use the I/O performance of the shared resources to determine the cause.	3	Check the I/O performance of storage ports for device files.	Check Storage Port Performance
	4	If the I/O performance of the server on which the application is running is not a problem, check whether any other servers access the same storage port.	Check Connected Server Performance
	5	Check the I/O performance of the other servers.	
	6	Identify any servers placing a heavy load on the storage port.	
	7	If the I/O performance of the storage port is not a problem, check the I/O performance of the array group.	
	8	Check whether any other servers access the same array group.	
	9	Identify any servers placing a heavy load on the array group.	

Example Analysis Procedure

This section provides an example of a performance bottleneck analysis procedure. The example is based on the items described in the previous sections. Figure 9-3 shows the configuration of the system to be monitored in the example.

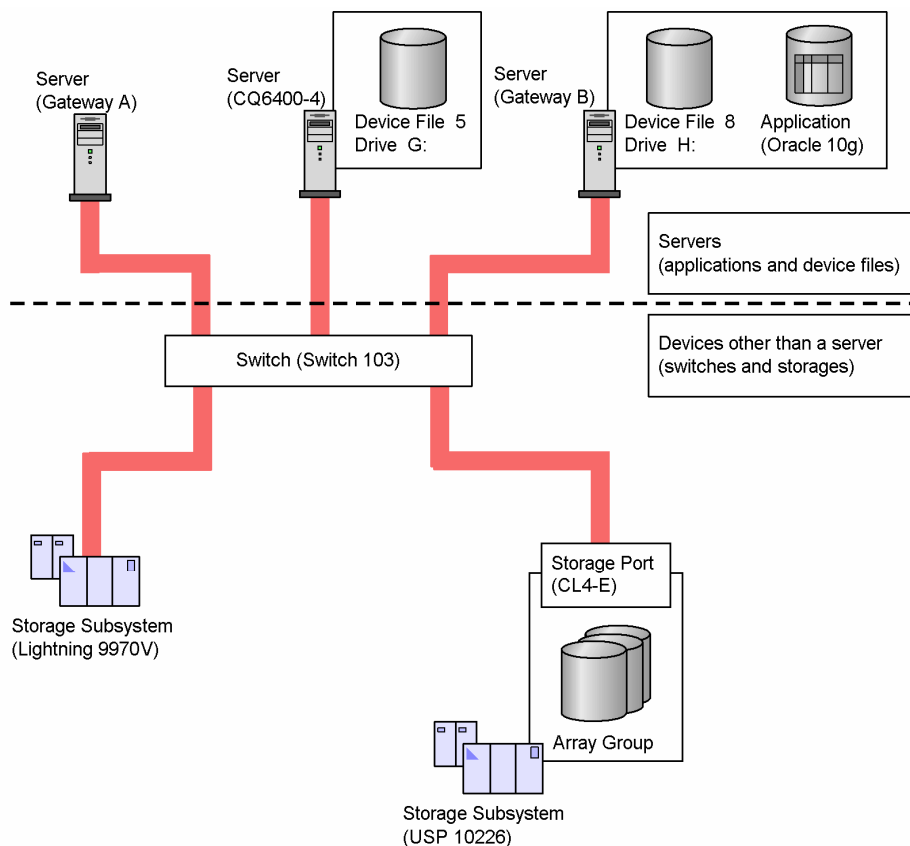


Figure 9-3 Configuration of the System to Be Monitored

Table 9-2 lists the components of the system to be monitored in the example.

Table 9-2 Components of the System to Be Monitored

Component	Name
Server	- Gateway A - Gateway B - CQ-6400-4
Switch	Switch 103
Storage	- Lightning9970V - USP 10226

Analyzing the Performance Bottleneck

The following procedures are used to analyze the performance bottleneck.

Identify the Host Name Based on the Oracle Instance

1. In the title area of the application area, click the **Create** button.
The **Create report window** window appears.
2. In the **Create report window** window, specify a time period during which system operation was stable, and then click the **Save** button to save the report window.
3. In the title area of the application area, click the **Create** button.
The **Create report window** window appears.
4. In the **Create report window** window, specify the time period during which the problem occurred, and then click the **Save** button to save the report window.
5. In the explorer area, choose **Resources** and then **Applications**.
6. In the navigation area, choose **Oracle**.
Oracle instances are listed in the information area (correlation view). You can see that an instance named **HTM** is running on Gateway B.
7. In the explorer area, choose **Resources** and then **Hosts**.
8. In the navigation area, select **Gateway B**.
The configuration and capacity information about the resources related to Gateway B is displayed in list format in the information area (correlation view).
9. Click the **Correlation Wizard** button.
The Correlation Wizard - Gateway B window appears.
10. Select the check boxes of the resource types you want to analyze, and then, from the drop-down list, select the metric to be analyzed for each resource.
11. For **Primary report window**, specify the report window you saved in step 2.
12. For **Secondary report window**, specify the report window you saved in step 4.
13. Click the **>Next** button.
The capacity and performance information for the metrics that you chose for the selected resources is displayed for the time periods specified in **Primary report window** and **Secondary report window**. Compare the data for the normal operating period to the data for the abnormal operating period to see which metric values for the resources show significant differences.

Check the I/O Response Time

1. Redisplay the Main Console window. In the information area (correlation view), choose the **Device Files** tab, and then click the **Performance Summary** button.

The Performance Summary - Device Files window appears. This window displays the performance data for the time displayed in this window.

2. If you want to change the time frame to the time frame in which the problem occurred, click the displayed time.

The Edit - Report Window window appears.

3. Specify a time period that includes the occurrence of the problem, and then click the **OK** button.

The information displayed in the Performance Summary - Device Files window changes to the performance data for the time at which the problem occurred.

In the performance information list displayed in the Performance Summary - Device Files window, choose the **I/O Response Time** header.

4. The rows are sorted in descending order of the I/O Response Time values. You can see that the I/O Response Time value for device file 8 is the largest.
5. Redisplay the Main Console window, and then, in the navigation area, choose **Device Files**.

6. In the information area (Correlation View), choose **Device File 8**.

Device file 8, which was hidden, is displayed in the navigation area. Also, a report about device file 8 is displayed in the report area.

7. Click the IOPS graph that is displayed as a thumbnail in the information area (Embedded Custom Charts).

The thumbnail is displayed as a full size graph.

8. Check the performance data trends.
9. In the global tasks bar area, choose **Go** and then **Performance Reporter** to check more detailed trend information.
10. In the Information frame, choose **User Reports**.

A list of predefined reports appears.

11. Select **I/O Response Time**.

The Show Options window appears. For details on how to define the reports that are displayed here, see [Example of Creating a Report When Filter Conditions Are Connected by OR](#).

12. In the Show Options window, specify the values shown in Table 9-3.

Table 9-3 Settings in the Show Options Window for Checking IDs

Item		Settings
Settings for the report display period	Start Time	To clarify how the performance information changed, specify times before and after the deterioration in Oracle performance seemed to begin.
	End Time	
	Report Interval	Minute
Filter	ID	8 Note: Since you found in step 2 that the I/O Response Time value for device file 8 was the largest of the device files used for Gateway B, specify 8.
	Disk Bytes/sec	0 Note: The Main Console and Performance Reporter manage different IDs. In this specification, you know that the device file ID in the Main Console is 8, but do not know the ID in Performance Reporter. To display a list of the device file IDs managed by Performance Reporter, specify 0 for Disk Bytes/sec.

I/O Response History appears for all device files on Gateway B.

In the displayed report, check the ID of device file 8.

This example assumes that the ID of device file 8 (checked above) is 8ΔH: (Δ indicates a space).

13. In the Show Options window, specify the values shown in Table 9-4.

Table 9-4 Settings in the Show Options Window for Checking the I/O Response Time

Item		Settings
Settings for the report display period	Start Time	To clarify how the performance information changed, specify times before and after the deterioration in Oracle performance seemed to begin.
	End Time	
	Report Interval	Minute
Filter	ID	8ΔH: Note: Since you found in step 8 that the ID of device file 8 used for Gateway B was 8ΔH:, specify 8ΔH:.
	Disk Bytes/sec	99999999 Note: To display the I/O Response Time value only for device file 8, specify a value that exceeds the maximum possible performance value for the relevant environment. 99999999 is specified here.

I/O Response History appears for device file 8 on Gateway B. You must check whether the increase in the I/O Response Time value was caused by shared resources (ports and array groups).

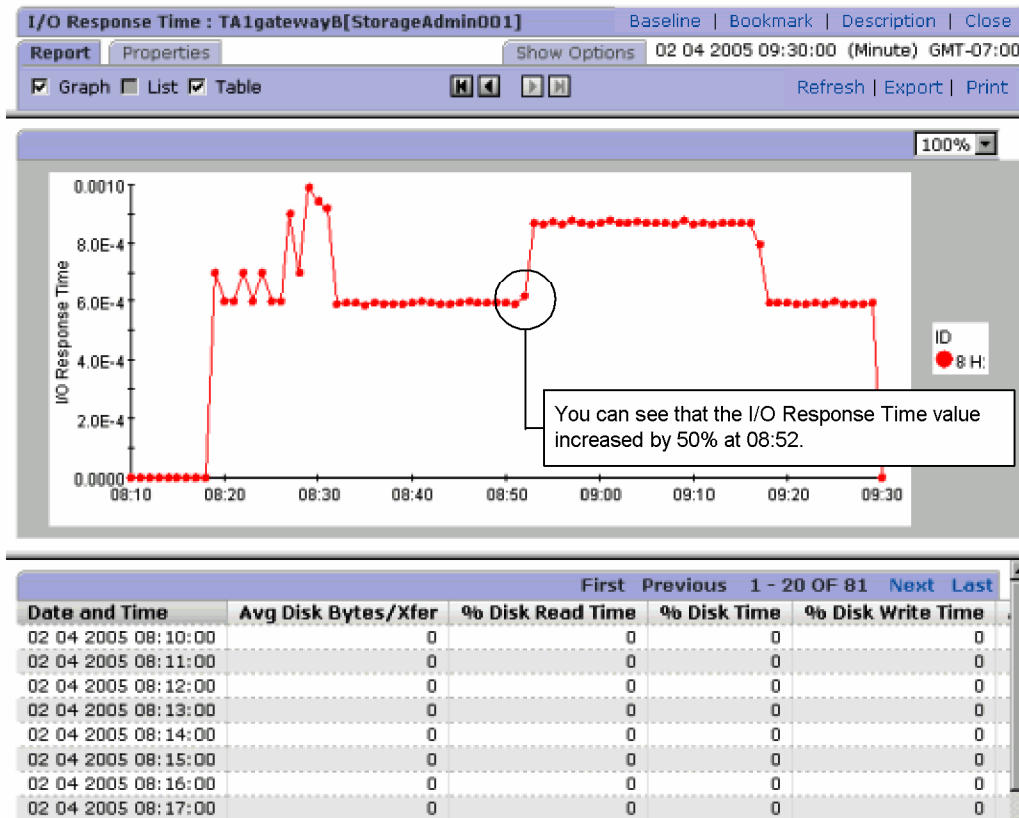


Figure 9-4 I/O Response History for Device File 8 on Gateway B

Check Storage Port Performance

To check the performance of the storage port:

1. Redisplay the Main Console window. In the information area (correlation view), choose the Ports tab and then **CL4-E**, which is the port for device file 8.

Information about CL4-E appears in the report area.

2. Click the IOPS graph that is displayed as a thumbnail in the information area (Embedded Custom Charts).

The thumbnail is displayed as a full size graph.

3. Check the performance data trends.
4. Click the **Performance Reporter** button to check more detailed trend information.

Performance Reporter starts.

5. In the Information frame, choose **User Reports**.

The predefined report list appears.

6. Choose **I/O Rate**.

The Show Options window appears. For details on how to define reports displayed in this window, see [Example of Creating a Report When Filter Conditions Are Connected by OR](#).

7. In the Show Options window, specify the values shown in Table 9-5.

Table 9-5 Settings in the Show Options Window for Checking the Storage Port Performance

Item		Settings
Settings for the report display period	Start Time	To clarify how the performance information changed, specify times before and after the deterioration in Oracle performance seemed to begin.
	End Time	
	Report Interval	Minute
Filter	Port Name	CL4-E

Xfer Rate History for CL4-E appears. You need to determine the server that caused the increase in the Transfer Rate value for CLL4-E.

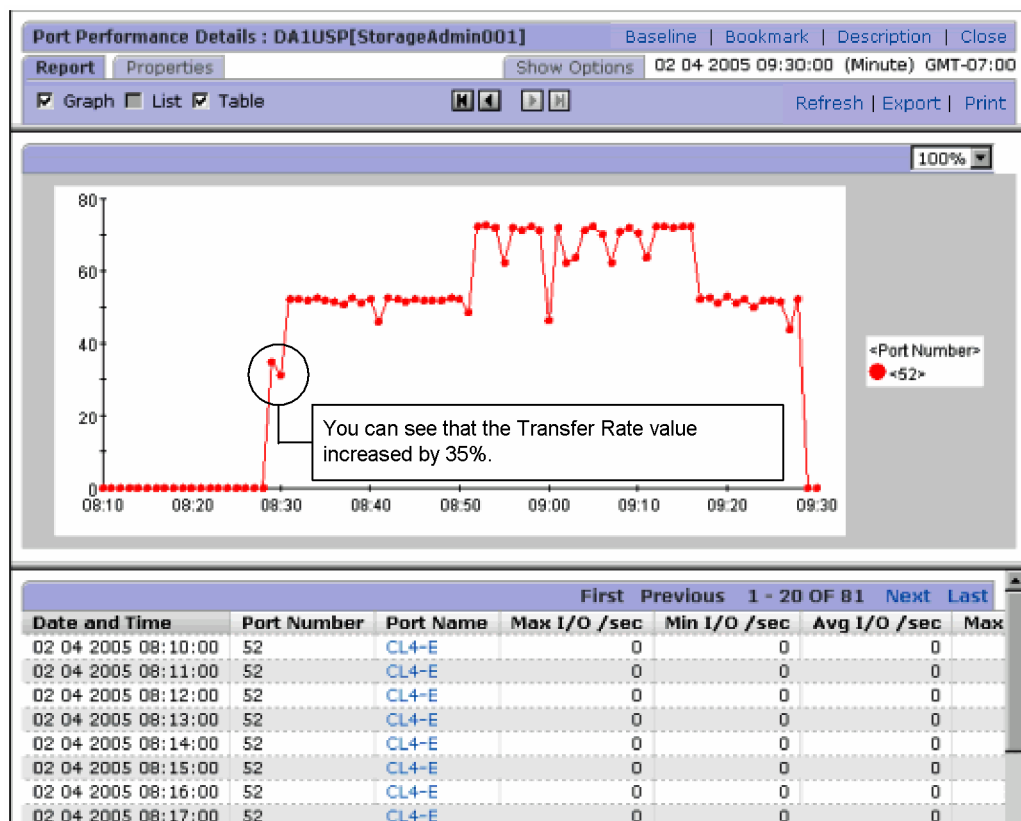


Figure 9-5 Xfer Rate History for CL4-E

Check Connected Server Performance

1. Redisplay the Main Console window. In the information area (correlation view), choose the **Hosts** tab.
All the device files that use CL4-E are listed.
2. Click the **Performance Summary** button.
The Performance Summary - CL4-E window appears. This window displays the performance data for the time displayed in this window.
3. If you want to change the time frame to the time frame in which the problem occurred, click the displayed time.
The Edit - Report Window window appears.
4. Specify a time frame that includes the occurrence of the problem, and then click the **OK** button.
The information displayed in the Performance Summary - CL4-E window changes to the performance data for when the problem occurred.
5. Choose **Transfer** in the table header for the performance data list displayed in the Performance Summary - CL4-E window.
Data is sorted in descending order of Transfer values. After sorting data in the **Transfer** column in descending order, you can see that the Transfer value for device file 5 in CQ6400-4 is the largest.
6. Redisplay the Main Console window, and then click the **Performance Reporter** button.
Performance Reporter starts.
7. In the Navigation frame, choose **Windows**.
8. In the Information frame, choose **User Reports**.
A list of predefined reports appears.
9. Select **Connected Server Performance**.
The Show Options window appears. For details on how to define the reports to be displayed here, see [Example of Creating a Report When Filter Conditions Are Connected by OR](#).
10. In the Show Options window, specify the values shown in Table 9-3.



Note: Specify 5 for the Filter ID.

Transfer Rate History appears for all device files on CQ6400-4.

In the displayed report, check the ID of device file 5.

This example assumes that the ID of device file 5 (checked above) is 5ΔG: (Δ indicates a space).

11. In the Show Options window, specify the values shown in Table 9-6.

Table 9-6 Settings in the Show Options Window for Checking the Transfer Rate History

Item		Settings
Settings for the report display period	Start Time	To clarify how the performance information changed, specify times before and after the deterioration in Oracle performance seemed to begin
	End Time	
	Report Interval	Minute
Filter	ID	5GA: Note: Because you found in step 6 that the ID of device file 5 used for CQ6400-4 was 5AG:, specify 5AG:.
	Disk Bytes/sec	99999999 Note: To display the Transfer Rate History value only for device file 5, specify a value that exceeds the maximum possible performance value for the relevant environment. 99999999 is specified here.

Transfer Rate History for CQ6400-4 appears.

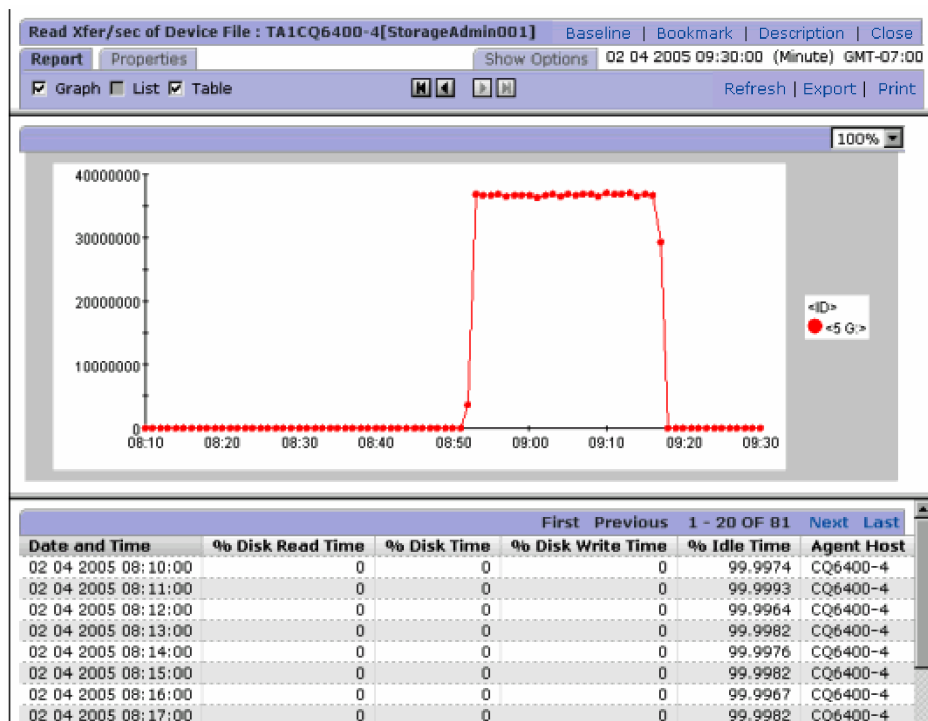


Figure 9-6 Transfer Rate History for CQ6400-4

You can see that the I/O value for CQ6400-4 rose sharply. This means that the performance deterioration on Gateway B was caused by a rapid increase in I/O by CQ6400-4, which was using the same port as Gateway B.



Restrictions on the Tuning Manager Series

This appendix describes the restrictions on the Tuning Manager series.

Information Displayed in the Main Console

The metrics displayed in the Main Console are a part of the data that Agents collect. To view data that is not displayed in the Main Console, use Performance Reporter. For details about data collected by Agents, see the following manuals:

- *Hitachi Tuning Manager Hardware Reports Reference*
- *Hitachi Tuning Manager Operating System Reports Reference*
- *Hitachi Tuning Manager Application Reports Reference*

Performance Data in an HP-UX Environment

In an HP-UX environment, the following data cannot be reported, and **n/a** is displayed instead of the actual data:

- Read IOPS
- Write IOPS
- Read Transfer
- Write Transfer

Performance Data of Agents in an AIX Environment

In an AIX environment, the following data cannot be reported, and **n/a** is displayed instead of the actual data:

- Read IOPS
- Write IOPS
- Disk Queue Length (Queue length of I/O requests to the disk)

Performance Data for the Thunder9200

For the Thunder9200, the following data cannot be reported, and **n/a** is displayed instead of the actual data:

- Storage port performance
 - Max IOPS (Maximum IOPS on the port)
 - Min IOPS (Minimum IOPS on the port)
 - IOPS (IOPS on the port)
 - Max Transfer (Maximum transfer on the port)
 - Min Transfer (Minimum transfer on the port)
 - Transfer (Transfer on the port)
- Array group performance
 - Transfer (Transfer on the disk)
 - Read Transfer (Read transfer on the disk)
 - Write Transfer (Write transfer on the disk)
- LDEV performance
 - Transfer (Transfer on the disk)
 - Read Transfer (Read transfer on the disk)
 - Write Transfer (Write transfer on the disk)
 - I/O Response Time
 - Read I/O Response Time
 - Write I/O Response Time
- Cache performance
 - Cache Usage
 - Cache Free
 - Cache %
- Processor performance
 - Busy Rate (Operating rate of the processor)
 - Max Busy Rate (Maximum operating rate of the processor)

Performance Data for the Lightning 9900 Series

For the Lightning 9900 series, the following data cannot be reported, and **n/a** is displayed instead of the actual data:

- Array group performance
 - Write Hit Rate
- LDEV performance
 - Write Hit Rate
 - I/O Response Time
 - Read I/O Response Time
 - Write I/O Response Time

Performance Data for the Universal Storage Platform V/VM Series, Hitachi USP, and Lightning 9900V Series

For the Universal Storage Platform V/VM series, Hitachi USP, and Lightning 9900V series, the following data cannot be reported, and **n/a** is displayed instead of the actual data:

- Array group performance
 - Write Hit Rate
- LDEV performance
 - Write Hit Rate

Configuration Information for the Thunder 9500V Series

For an environment where LUN Management has not been installed, the information about the host storage domain cannot be reported, and **no data** is displayed instead of the actual information.

Agent Restrictions

This section describes the restrictions that apply to Agents when using the Main Console.

Managing Agents

You cannot add, delete, or update Agents during Tuning Manager server polling. Perform these operations after the polling has finished.

Consult the system administrator for the polling schedule, interval, and period.

Restrictions Regarding the Combination of Agents

Depending on the combinations and versions of Agents to be monitored, a Tuning Manager server might not be able to display parts of the information. Before operating a Tuning Manager server, check the restrictions regarding the combination of Agents.

Required Agent for Displaying Server Information with Tuning Manager Server

Agent for Server Systems must be installed so that the Tuning Manager server can display server information.

When Agent for Server Systems is not monitoring a server, the following restriction applies to the Tuning Manager server:

- In the Resource Tree, the network resources (**Whole Network**, **Subnetwork**, **Server**, **Filesystems**, and **Device Files**) are not displayed.

Monitoring of LDEVs Whose Logical Paths Are Not Set

The Main Console can display the information of LDEVs whose logical paths are not set only when (i) the version of Agent for RAID is 5.1 or later, and (ii) the settings for acquiring such information were specified during setup of the instance environment.

For details on how to set up the instance environment of Agent for RAID, see the *Hitachi Tuning Manager Installation Guide*.

Disk Performance Metrics Collected by Agent for Server System

In a Windows 2000 environment where Agent for Server System is operating, the disk performance metrics for the disks whose disk names begin with `Harddisk` in the Windows 2000 Performance Monitor are displayed as **no data** in the Tuning Manager server window.

Restrictions When Using a Core License Version of Device Manager

If you are using a core license version of Device Manager, data for the metric **Label** cannot be acquired. Instead of the correct data, **no data** will be displayed.

Contacting Technical Support

If you require support, please contact your administrator first. A Tuning Manager server records extensive information in server-based logs. Your administrator might be able to identify further information related to your problem.

If you are unable to obtain answers to your questions or require further support, gather the following related information before contacting the Support Center:

- Error code(s) and message(s) displayed in your browser
- Relevant screen captures (if possible)
- A record of actions leading to the error or unexpected event

The Hitachi Data Systems customer support staff is available 24 hours a day, seven days a week. If you need technical support, please call:

- United States: (800) 446-0744
- Outside of the United States: (858) 547-4526

Functional Differences Between Tuning Manager Server Version 6.0 and 5.9

This appendix describes the functional differences between Tuning Manager server version 6.0 and Tuning Manager server version 5.9.

Newly Supported and Changed Functions in Tuning Manager Server Version 6.0

Table B-1 describes the newly supported and changed functions in Tuning Manager server version 6.0.

Table B-1 List of Newly Supported and Changed Functions in Tuning Manager Server Version 6.0

Category	Item	Description
Scalability improvements	Increase in the maximum number of resources that can be monitored	The maximum number of resources that can be monitored has increased from 16K to 128K.
	Display of minute-by-minute performance information	Minute-by-minute performance information can now be displayed as reports in the Main Console.
Enhancements to the storage-related report functions	Display of Host/Array-related reports based on HSD (Host Storage Domain) information	The Main Console can now be used to display performance analysis reports based on a Host Storage Domain (HSD) by acquiring HSD-related configuration information from Device Manager. (This enhancement enables the Tuning Manager server to display Host/Array-related reports in environments that do not have Agent for Platform.)
	Display of performance reports on intra-subsystem processors	The Main Console can now be used to display the reports on the performance of intra-subsystem processors that could be displayed by using Performance Reporter.
	Display of capacity reports on subsystem-related amounts of allocated storage and unallocated storage	The Main Console can now be used to display reports on capacity by periodically acquiring the amounts of allocated storage and unallocated storage in storage subsystems.

Category	Item	Description
Enhancements to the storage-related report functions (continued)	Display of midrange storage subsystem controller information	The names of related controllers are now displayed in reports on existing midrange storage subsystems.
	Display of midrange storage subsystem drive reports	The Main Console can now be used to display reports on the drive performance information of midrange storage subsystems supported by Agent for RAID version 5.9.
	Display of Dynamic Provisioning capacity analysis reports	The Main Console can now be used to display the reports on the capacity for Dynamic Provisioning that could be displayed by using Performance Reporter.
	Enhanced array-group performance analysis function	The following information has been added to reports on existing array groups: ▪ Disk type (FC or SATA) ▪ Metrics added in Tuning Manager server version 6.0 (Random read IOPS/Transfer, Random write IOPS/Transfer, Sequential read IOPS/Transfer, and Sequential write IOPS/Transfer)
	Modification of the storage-related navigation tree	The order of items displayed in the navigation tree has been changed to the following order: ▪ Subsystems, Fabrics, Hosts, Applications, NASs/Other Apps Additionally, the following instances are no longer displayed by default in the navigation tree: ▪ port, clpr, chp, dkp, array group, ldev, devicefie
Enhancements to the host report function	Enhanced device file performance analysis function	Information about the disk queue depth has been added to reports on device files.
	Support of VxVM disk groups	With enhancements to version 5 of Agent for RAID Map, the Main Console can now be used to display relationships between File Systems and device files based on VxVM disk groups.
	Grouping of hosts by OS type	Summary information can now be displayed for hosts grouped by OS type.
Support of the common guidelines for Hitachi Storage Command Suite products	LDEV nickname function	The Main Console can now display nicknames specified in Device Manager.
	Support of the Common Component window framework	The window framework has been changed to that which is used by other Hitachi Storage Command Suite products.
	Support of common user management for Hitachi Storage Command Suite products	The Tuning Manager server now supports the Hitachi Storage Command Suite product common user management functionality used for other Hitachi Storage Command Suite products.
	Support of external authentication servers	External authentication servers (such as LDAP directory servers and RADIUS servers) can now be used for login authentication.

Category	Item	Description
Support of the common guidelines for Hitachi Storage Command Suite products (continued)	Date format change	The date format (YYYY-MM-DD HH:MM) has been changed to the one used for other Hitachi Storage Command Suite products. <i>YYYY</i> : years, <i>MM</i> : months, <i>DD</i> : days, <i>HH</i> : hours, and <i>MM</i> :minutes
	Subsystem name change	Displayed subsystem names have been changed to the ones used for Device Manager.
	Storage port name change	Displayed storage port names have been changed to the ones used for Device Manager.
	Branding change	The product name has been changed from HiCommand Tuning Manager to Hitachi Tuning Manager.
Usability improvements	Support of context-sensitive Help	Help information appropriate for the contents of a Main Console window can now be invoked.
	Display of performance information by default	Reports (historical reports) related to performance data that is required for analysis can now be displayed in the Main Console main window by default. Therefore, the place where performance information is displayed has been changed from the summary area to the information area (Embedded Custom Charts).
	Saving of the settings related to the report time and period	The settings related to the report time and period can now be saved and managed for each user.
	Improved navigation tree	In the navigation tree, LDEVs, device files, and other resources whose numbers might increase are now hidden.
	Use of the Favorite Chart function for each user	Favorite Charts can now be saved and managed for each user.
	Enhancements to related resource reports (provided by Correlation reports)	Multiple correlated reports can now be displayed in one window.
	Improved Main Console report windows	The design of the report windows displayed in the Main Console has been changed.
	Improved usability of the Main Console administration window	The design of the administrator window provided by the Main Console has been changed.
	Exponents no longer displayed	Exponents are no longer displayed.
	Configuration history report provided	The history of configuration information can now be managed. Additionally, the configuration information for a specific time or period specified by the user can now be displayed.
	Setup of polling schedule	A polling schedule can now be set up for each Agent instance.
	Support for alarm definition and operation in the GUI	The conditions for issuing alarms can now be defined in a Performance Reporter window.
	Graphical display of the statuses of Agents or of the hosts where Agents are installed	The statuses of Agents or the hosts where Agents are running can now be detected and displayed as events in Performance Reporter windows.

Category	Item	Description
Usability improvements (continued)	Management and setup of Agents in the GUI	The following operations for Agents are now available in Performance Reporter windows: ▪ Changing the method for recording performance data ▪ Changing the conditions for saving performance data ▪ Viewing the disk capacity used by Store databases ▪ Specifying properties unique to Agents
	Management of the Collection Manager Store database in the GUI	The following operations for Collection Manager are now available in Performance Reporter windows: ▪ Changing the maximum number of records for event data ▪ Viewing the disk capacity used by the Store database
	Display of combination reports	Different reports can now be displayed in one report window in Performance Reporter.
	Output of reports in HTML format	Reports can now be output in HTML format by using the Performance Reporter GUI or the <code>jpcrpt</code> command.
DB management functionality improvements	Database capacity management	An alert can now be issued if the amount of free space in the Tuning Manager server database becomes insufficient.
	Increase in the maximum size of RD areas used by the Main Console	The size of RD areas specified during a new installation has been set to 2 GB. Also, the database size selections (Large , Medium , and Small) have been removed, and a maximum database size of 32 GB can now be specified, in 2 GB increments.
Simplified installation process	Not applicable	Server Part1 and Server Part2, which had to be installed separately, have been integrated into one module.
Support for IPv6	Not applicable	The Tuning Manager server can now operate in an IPv6 environment.
Added commands	Not applicable	The following commands have been added: ▪ <code>htm-processors</code> ▪ <code>htm-chps</code> ▪ <code>htm-dppools</code> ▪ <code>htm-drives</code> ▪ <code>htm-dkps</code> ▪ <code>htm-db-status</code> ▪ <code>htm-dvm-setup</code> ▪ <code>hcmdscheckauth</code> ▪ <code>hcmdschgurl</code> ▪ <code>hcmdsldapuser</code> ▪ <code>hcmdslink</code> ▪ <code>hcmdsradiussecret</code>
Added or changed messages	Not applicable	The message IDs and message texts related to installing the Main Console or a Tuning Manager server have been changed.

Functions that Have Been Removed from Tuning Manager Server Version 6.0

Table B-2 describes the functions that have been removed from Tuning Manager server version 6.0.

Table B-2 List of Functions Removed from Tuning Manager Server Version 6.0

Removed Function	Description
Stand-alone mode	Because common user management is now supported for Hitachi Storage Command Suite products, user management functionality provided exclusively by the Tuning Manager server (stand-alone mode) has been removed.
Performance alert notification of the Main Console	The performance alert notification functionality of the Main Console has been removed. Alternate method: You can use the alarm notification functionality of Performance Reporter (see Monitoring Operations Using Alarms).
Quarterly reports	Reports that consolidate values quarterly can no longer be displayed. Alternative method: You can display a report on quarterly performance (see Specifying a Reporting Timeframe).
Listing file systems below the specified threshold	The function that lists file systems whose free space is below the user-specified threshold has been removed. Alternative method: You can use the filtering function (see Displaying the Main Report).
Agent management and setup	The functions used to display and modify Agent settings by using the Main Console have been removed. Additionally, the function for executing <code>jpcctrl delete</code> from the Main Console GUI has been removed. Alternative method: You can use the functions provided by Performance Reporter to display and modify Agent settings (see the <i>Hitachi Tuning Manager Agent Administration Guide</i>).
Starting Storage Navigator	The function used to start Storage Navigator directly from the Main Console has been removed. Alternative method: You can start Storage Navigator from Device Manager, which is registered in the Dashboard menu (see Launching Other Applications). Note: To perform volume migration, start HTSM from the Dashboard menu.
Growth rate	The growth rate can no longer be calculated or displayed. Alternative method: You can display a report on the capacity (see Displaying the Main Report).
Host/Array view and historical response	The Host/Array view and historical response have been removed. Alternative method: You can use the Correlation Wizard (see Displaying a Correlation Report).
List connected resources report and List correlated storage resources report	The List connected resources and List correlated storage resources reports have been removed. Alternative method: You can use the Correlation Wizard (see Displaying a Correlation Report).

Removed Function	Description
Capacity consolidation in the time-axis direction	Capacity consolidated in the time-axis direction can no longer be displayed. Instead, the value at the end of the target time period is displayed as the representative value.
Consolidation of performance information on a related resource basis	Performance information obtained by consolidating the performance information of related resources (the consolidated performance information of all hosts or subsystems) can no longer be displayed. Note: Capacity information obtained by consolidating the capacity information of related resources can still be displayed.
Grouping of hosts by subnet	The function used to group hosts by subnet has been removed. Alternative method: You can use spreadsheet software such as Excel to sum up the capacity or performance values output from the CLI on a subnet basis (see Exporting Reports).
Grouping of switches by fabric	The performance data of switches for each fabric can no longer be displayed.
Bookmark function	The bookmark function provided by the Main Console has been removed.
Change of the data output method used in the CLI	The method used to output data by separating it with spaces when the data is exported in the Main Console CLI has been removed. (Only the method used to output data by separating it with commas remains.)
Starting Performance Reporter while Agent for RAID Map is selected	Agent for RAID Map has been removed from the Agents that can be selected when starting Performance Reporter by selecting a resource from the main window of the Main Console.
Commands	The following commands can no longer be used: - htm-whole-network - htm-subnets - htm-whole-fabric - htm-fabrics - htm-db-cleanup - htm-switch-mode
Display of source data from Favorite Charts	Source data (table format data) can no longer be displayed from Favorite Charts. (Favorite Charts has been renamed to Trend Charts, and the graphs of performance data are now displayed as thumbnails.)

Metrics that Are No Longer Displayed in the Main Console

In Tuning Manager server version 6.0, some metrics that correspond to resources are no longer displayed in Main Console. Table B-3 lists the correspondences between resources and metrics that are no longer displayed.

Table B-3 Correspondences Between Resources and Metrics that Are No Longer Displayed in the Main Console in Version 6.0

Resource Name	Attribute
Storages	Port Transfer, Port IOPS, Disk Transfer, and Disk IOPS
Subsystem	Port IOPS, Port Transfer, Port Min/Max Transfer, Disk IOPS, Disk Read IOPS, Disk Write IOPS, Disk Transfer, Disk Read Transfer, and Disk Write Transfer
Hosts	IOPS, Read IOPS, Write IOPS, Transfer, Read Transfer, Write Transfer, and Growth rate
Sub network	All attributes
Host	IOPS, Read IOPS, Write IOPS, Transfer, Read Transfer, Write Transfer, and Growth rate
File System	Growth rate
Fabrics	All attributes
Fabric	All attributes
Oracle instances	IOPS, Read IOPS, Write IOPS, and Growth rate
Oracle table space	Growth rate



Acronyms and Abbreviations

ASCII	American Standard Code for Information Interchange
CLI	Command Line Interface
CLPR	Cache Logical PaRtition
CPU	Central Processing Unit
CRC	Cyclic Redundancy Check
CSV	Comma Separated Values
DDL	Data Definition Language
GUI	Graphical User Interface
HA	High Availability
HDU	Hard Disk Unit
HTM	HiCommand Tuning Manager
HTTP	HyperText Transfer Protocol
I/O	Input/Output
ICMP	Internet Control Message Protocol
ID	identifier, identification
IP	Internet Protocol
IPF	Itanium Processor Family
LAN	Local Area Network
LDEV	Logical Device Unit
LUN	logical unit number
LUSE	Logical Unit Size Expansion
MB	Megabyte
MIB	Management Information Base
NAS	Network Attached Storage
NFS	Network File System
OS	Operating System
RAID	redundant array of inexpensive disks
SAN	Storage Area Network
SLPR	Storage Logical PaRtition

SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
SQL	structured query language
SSO	Single Sign On
SVP	SerVice Processor
TCP	transmission control protocol
UDP	User Datagram Protocol
WWN	World Wide Name
WWW	World Wide Web
XML	Extensible Markup Language



Glossary

This glossary defines the special terms used in this document. Click the desired letter below to display the glossary entries that start with that letter.

#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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A

Agent

One of the Tuning Manager product programs. Agents collect and record information about system performance and system configuration. Agents are available to suit the system being monitored (for example, Agent for Server System, Agent for RAID, and Agent for Oracle).

Alarm

The definition of system behavior when data reaches the threshold value

Alert

This is a warning that is issued in the following cases:

- Polling is performed the specified number of times, but a polling attempt fails.
- Polling does not finish within the specified time period.
- The database capacity of the Tuning Manager server exceeds a certain amount (85 %).

Always Evaluated

Alerts using this setting will continuously be monitoring the conditions you specify.

Array Group

RAID array

Array Groups

RAID arrays

Average IOPS

The mean value of all IOPS measurements for the time period specified in the Report Window Setting window

Average Transfer

The mean value of all Transfer measurements for the time period specified in the Report Window Setting window

B

Baseline

An object that stores a report for a period in the past that is considered standard. The baseline can be superimposed on a combination report.

Bookmark

A bookmark that you can use to register reports with specified report definitions, report display conditions, and target Agents. You can use a bookmark to display reports in fewer steps and to simultaneously display reports for different Agents and reports with different report definitions.

Bookmarks

Named links kept on a Tuning Manager server that you can save for easy access to pages throughout the software

Buffer Credit Zero State

Indicates that the receiving switch port is busy as a result of consuming all available buffer credits. The Tuning Manager server increments the count for each occurrence of this condition.

C

Cache %

The portion of cache capacity used. Presented as a percentage. $(\text{Cache Usage} / \text{Cache Capacity}) * 100$

Cache Capacity

The full size of the cache

Cache Free

The portion of unused cache capacity

Cache Memory Installed Size

The total amount of cache memory installed in the Thunder9500V series

Cache Usage

The portion of cache capacity used

Capacity

Total storage space. (This value is aggregated for all sub-resources below the level you have selected in Resource Tree.)

Capacity Forecast

Predicted future storage free space and usage. A Forecast uses historical data as a sample to anticipate future values. (This value is aggregated for all sub-resources below the level you have selected in Resource Tree.)

Capacity History

Total storage space over the specified time span. (This value is aggregated for all sub-resources below the level you have selected in Resource Tree.)

CHA

A CHA (channel adapter) is a component that has at least one storage port

CHP

A CHP (channel adapter processor) is the processor on a CHA

CLPR

CLPR (cache logical partition) functionality enables partitioning (splitting) of a cache. This functionality partitions (that is, splits) the cache by array groups in the storage subsystem, so that other array groups do not affect cache performance.

CLPR Number

The number assigned to the CLPR selected in the Resource Tree

Cluster system

A cluster system links multiple server systems together and operates them as one system. In this manual, the term cluster system refers to an HA cluster system.

Collection Interval

A Tuning Manager server stores metrics values for these intervals: by the minute (every minute), hourly (every hour), daily (every day), weekly (every week), monthly (every month), and yearly (every year).

Combination bookmark

An object that holds and manages multiple registered reports and baselines. You can use a combination bookmark to display combination reports.

Confidence Level

The confidence level you select for a forecast determines how broad the charted region is that will be drawn between likely upper and lower bounds. At a 0.95 confidence level, there is a 95% probability that the forecasted values will appear between the upper and lower error margins. (If you specify a 0.99 confidence level, the resulting chart presents a broader region between the upper and lower error margins.)

CPU Usage

Percentage of total CPU capacity used. (This value is aggregated for all sub-resources below the level you have selected in Resource Tree.)

D

Damping

A technique to avoid excessive alerts. A Tuning Manager server only triggers an alert when a specified number of occurrences (Damping Occurrences) within the specified number of samples (Damping Interval).

Damping Interval

When you enable damping in alert monitoring, this value determines how many samples will be evaluated. If your specified number of Damping Occurrences is reached within the damping interval, an alert will be issued.

Damping Occurrences

If damping is enabled, the number of times an alert condition must be met before an alert is issued. These occurrences must all be contained within your specified Damping Interval.

Data File

A collection of data stored on media as a unit within the filesystem

Data Files

Collections of data stored on media as a unit within the filesystem. (This value is aggregated for all sub-resources below the level you have selected in Resource Tree.)

Data Point

A value for a specific metric at a specific point in time

Data model

Collective name for the records and fields of each Agent. The data model is managed by the version.

Date

The Record Time for the data currently displayed.

Delimiter

A character or symbol indicating the delimitation of data

Delta

Displaying the difference between the values of the previously collected data and currently collected data for the performance data of a field is called delta. The data source of the field is the information that is managed as cumulative values.

For example, suppose a field whose data source is a counter for I/O processing, where the counter value obtained during the first collection is 3 and the counter value obtained during the second collection is 7. The output value of this field at the second collection is 7 (the counter value at the second collection) if the delta attribute is not applied to the field, or 4 (the difference between the first value and the second value) if the delta attribute is applied to the field.

Device File

On systems running the UNIX operating system, a file with specifications for a physical device. A device file indicates the location, type and method of access to a physical device.

Device Files

The quantity of device files at this level of the resource tree

Disk Group

A group of disks representing a single logical storage resource

Disk IOPS

Input/Output operations per second at the disk level.

Disk Random IOPS

Random operations per second at the disk level

Disk Random Transfer

Random transfer rate at the disk level

Disk Read IOPS

Read operations per second at the disk level.

Disk Read Transfer

The speed of data movement for read operations at the disk level.

Disk Sequential IOPS

Sequential operations per second at the disk level

Disk Sequential Transfer

Sequential transfer rate at the disk level

Disk Transfer

The rate at which data is moved at the disk level.

Disk Write IOPS

Write operations per second at the disk level.

Disk Write Transfer

The rate of writes data movement at the disk level.

DKA

A DKA (disk adapter) deals with array groups

DKP

A DKP (disk adapter processor) is the processor on a DKA

Domain ID

A unique integer identifier distinguishing the pool of resources that can be accessed by a given switch. Each switch uses the Domain ID in combination with the WWN addresses of the various attached devices to properly route data across the entire storage area network.

Drilldown report

A report that is associated with another report or a field in a report. You use a drilldown report to display detailed or related information about a report.

Dynamic Provisioning

A Universal Storage Platform V/VM function that allocates virtual volumes. This function allows you to dynamically allocate more capacity than is actually being used, and to allocate Dynamic Provisioning pools for the used capacity. A virtual volume allocated by using Dynamic Provisioning pools is called a Dynamic Provisioning volume. Volumes that make up a Dynamic Provisioning pool are called Dynamic Provisioning pool volumes.

E

Executing node

A logical (or “active”) node that is executing tasks in the server systems making up a cluster system

External Array Group

An Array Group to which the Logical Disk, allocated to the Universal Storage Platform V/VM series and Hitachi USP as a Virtual Logical Disk, belongs

External Logical Disk

A Logical Disk allocated to the Universal Storage Platform V/VM series and Hitachi USP as a Virtual Logical Disk

External Storage

The name of a storage subsystem externally connected to the Universal Storage Platform V/VM series and Hitachi USP. The External Storage contains Logical Disks allocated to the Universal Storage Platform V/VM series and Hitachi USP as Virtual Logical Disks.

F

Fabric

A network of interconnected fibre channel switches and cabling ensuring that one or more switches can transmit data between any two ports. The typical fabric includes at least two switches to provide fault tolerance.

Fabrics

Multiple networks of interconnected fibre channel switches and cabling. Each fabric maintains independent routing of data.

Failover

The transfer of processing of the server executing tasks from the executing node to a standby node if a failure occurs in a cluster system

Field

A performance data item; multiple fields constitute a record.

File system

The name of a filesystem. A filesystem is a scheme defining logical structures and software routines used to control access to the storage on a hard disk system. (This value is aggregated for all sub-resources below the level you have selected in Resource Tree and averaged over the chosen time period. The result is displayed as an integer value.)

File system type

The method used for storing and organizing data within a given operating system. (This value is aggregated for all sub-resources below the level you have selected in Resource Tree and averaged over the chosen time period. The result is displayed as an integer value.)

File systems

The number of filesystems. A filesystem is a scheme defining logical structures and software routines used to control access to the storage on a hard disk system. (This value is aggregated for all sub-resources below the level you have selected in Resource Tree and averaged over the chosen time period. The result is displayed as an integer value.)

Forecast

Forecast reports depict linear and non-linear trends in time series and allow you to project (forecast) that data into the future. At least 6 data points should be in the history to ensure meaningful forecasts.

Frame

A packet of bytes sent to or received by a SAN switch port. (Typically 2048 bytes.)

Free

The total available capacity. (This value is aggregated for all sub-resources below the level you have selected in Resource Tree.)

Free %

The percentage of free capacity as a percentage of all capacity. (This value is aggregated for all sub-resources below the level you have selected in Resource Tree.)

H**HA cluster system**

A cluster system designed to provide high availability. The purpose of this system is to continue operation even if a failure occurs. If a failure occurs in the server executing tasks, a standby server immediately takes over and continues operation processes. This prevents operation interruption in case of a failure and ensures high availability.

In this manual, the term "cluster system" means an HA cluster system.

Health check

A function that monitors the operating status of Agent services and the hosts on which Agents are running. This function is provided by Collection Manager.

Health check agent

An agent that monitors the operating status of Agent services and the hosts on which Agents are running

Historical report

A report indicating the status of a program being monitored from a time in the recent past to the current time. Performance Reporter can display two types of historical reports: Historical report (single agent) and Historical report (multi-agent).

Historical Response Time

The average I/O Response Time value

Hit Ratio

The number of cache hits transactions divided by the number of transactions.

Host

A TCP/IP-accessible computer (or entity) to which one or more storage subsystems are attached. In addition to its TCP/IP address, each host also has a name or alias.

Hosts

Including its subnetworks and storage-related servers, the entire scope of resources available to a Tuning Manager server

Hosts Capacity

Including its subnetworks and storage-related servers, the total storage space for all resources available to a Tuning Manager server

HSD

Host Storage Domain. A host storage domain is a unit used to apply LUN security that restricts the access of a host to a storage subsystem according to the host's WWN.

I**I/O Response Time**

The average response time for an I/O request

I/O Usage

The percentage of time during which I/O occurred

Information Frame

The area in the Tuning Manager server web client displaying data about the level you have chosen in Resource Tree

Inodes

In UNIX filesystems, inodes contain critical information about a file's user and group ownership and access permissions. To find the inode number for a given UNIX file, use the command `ls -li`. To determine the inode information for a given UNIX file, use the command `ls -li`. (This value is aggregated for all sub-resources below the level you have selected in Resource Tree.)

Input Buffer Full

Indicates that a buffer for a switch port is full. A Tuning Manager server increments the count for each occurrence of this condition.

Instance

An allocated memory area known as the SystemGlobalArea and one or more Oracle processes. Every Oracle database must be associated with one Oracle instance.

Instances

See Oracle Instances.

IOPS

Input/Output operations per second. (This value is aggregated for all sub-resources below the level you have selected in Resource Tree.) Also see Read IOPS and Write IOPS.

IP Address

Internet Protocol. A multi segment address delimited by dots used to uniquely identify devices and hosts on a network.

L**Last Record**

The date and time for the most recent polling period that is now saved in the application database. The last record time might not be the last polling period because processing is not complete. Polling might still be in progress, and aggregation and updates might still be pending.

LDEV

A numbered component using a logical or physical connection to a host. Also see Logical Device

Logical Device

A numbered component using a logical or physical connection to a host. Each logical device has its own set of resources. (Also referred to as a Logical Disk.)

Logical Devices

Numbered components each using a logical or physical connection to a host. Each logical device has its own set of resources. (Also referred to as Logical Disks.)

Logical Disk

A series of drives (or drive partitions) linked in such a way that the operating system views the entirety as a single storage device. RAID controllers provide one form of managing logical disks while providing benefits in the form of improved reliability, data availability, and performance. (Also known as: logical devices, logical drives, volumes, volume sets, logical storage units, logical units, units, and LUNS.)

Logical Disks

The quantity of logical disks in this subsystem

Logical host

A logical server that provides an execution environment when Performance Reporter is running in a cluster system. If a failure occurs, the system switches over on a per-logical host basis. Logical hosts maintain a dedicated IP address. At failover, the new logical host continues operation by inheriting the same IP address. Therefore, even if the physical server changes due to a failure, clients can still access the new server using the same IP address, as if a single server were always running.

Lower Error Margin

Lower range of possible values within the current forecast Confidence Level

LUN

Or Logical Unit. See Logical Disk

LUSE

Logical unit size expansion

M

Main Console

One of the programs constituting the Tuning Manager products. The Main Console accumulates performance data collected by Agents and enables the data to be displayed and analyzed with a Web browser.

Margin

Amount of deviation from the mean predicted value

Max I/O Usage

The highest value of I/O Usage within the time period specified in the Report Window Setting window

Max Side File Usage

The highest value of Side File Usage within the time period specified in the Report Window Setting window

Max Write Pending Rate

The highest value of Write Pending Rate within the time period specified in the Report Window Setting window

Maximum IOPS

The highest value of all IOPS measurements for the time period specified in the Report Window Setting window

Maximum Transfer

The highest value of all Transfer measurements for the time period specified in the Report Window Setting window

Memory

Random Access Memory

MIB

Management information base. A management information base is a description of network objects managed using the Simple Network Management Protocol. (Also see SNMP.)

Minimum IOPS

The minimum value of all IOPS measurements for the time period specified in the Report Window Setting window

Minimum Transfer

The minimum value of all Transfer measurements for the time period specified in the Report Window Setting window

Model

Product model number

Mountpoint

Before a device is accessible (mounted) by UNIX, a directory must be specified as the logical location for that device. The mountpoint is a directory used for that purpose. The Tuning Manager server reports the number of mountpoints on the monitored whole network and its resources. (This value is aggregated for all sub-resources below the level you have selected in Resource Tree.)

N

Navigation Frame

The area in the Tuning Manager server web client where you control what kinds of data will be displayed. The Navigation Frame includes Resource Tree and choices for editing your Profile and setting Bookmarks.

Network

The entire scope of resources available to a Tuning Manager server, including its subnetworks and storage-related servers

Node

Each computer that belongs to a cluster system

Num of forecast records

The number of data points to be forecasted, or the time span to be forecasted e.g.: 3 months, 5 days. The value for Num of forecast records should not span more than 20% to 25% of the forecast history. (e.g.: If you have 12 monthly data points in your history, then the value for Num of forecast records should be set no higher than 3 monthly data points. The data period is always the same for history and horizon. (If the history is made up of daily data points, then the periods used in the forecast are also daily.)

O

Operating System

The controlling software managing a computer's routing of storage, memory, display, and peripheral devices

Oracle

The relational database management system from Oracle Corporation.

Oracle Capacity

The total storage capacity allocated to Oracle

Oracle Instance

An Oracle process. Every Oracle database must be associated with one Oracle instance.

Oracle Instances

One or more Oracle processes. Every Oracle database must be associated with one Oracle instance.

P

Performance

The efficiency of input/output operations

Period Of Watching

You set the daily time period when the alert conditions are being monitored. For the remainder of the day, that alert remains dormant.

Port

(Storage) A logical connection to a disk array allowing multiple simultaneous read and write transactions. (Fabric) A logical connection to a Switch.

Port IOPS

Input/Output operations per second at the port, for the time period specified in the Report Window Setting window.

Port Max IOPS

The maximum value of all IOPS measurements at the port, for the time period specified in the Report Window Setting window

Port Max Transfer

The maximum value of all Transfer measures at the port, for the time period specified in the Report Window Setting window. (See **Note**)

Port Min IOPS

The minimum value of all IOPS measurements at the port, for the time period specified in the Report Window Setting window

Port Min Transfer

The minimum value of all Transfer measures at the port, for the time period specified in the Report Window Setting window. (See **Note**)

Port Module

Port module on the SAN switch

Port Modules

Number of SAN switch port modules at the current resource level

Port Number

Vendor's assigned identifier for the SAN switch port

Port Role

Specified port type for the disk array device

Port Speed

SAN switch port speed. (Normally 1 or 2 gigabit.)

Port Transfer

The rate at which data is moved at the port.

Port Type

Code for port type. (Typical values: E, F, G, H)

Port WWN

The unique address of a SAN switch port

Ports

The number of logical connections to a subsystem

Principal Switch

Every fabric contains one principal switch

Product

The storage subsystem hosting the filesystem

Product Detail record

A type of record that stores performance data indicating the system status at a specific time, such as detailed information about currently active processes. You use PD records to obtain the system status at a specific time, such as the operating status of the system or size of the file system currently in use.

Product ID

A byte identifier that indicates a Tuning Manager product; part of the service ID

Product Interval record

A type of record that stores performance data taken at specific intervals, such as the number of processes per minute. You use PI records to analyze changes to or trends in the system status over time, such as a change in the number of system calls issued over a specific period of time or a change in the size of the file system being used.

Product Log record

A type of record that stores log information about the application or database being executed on an Agent's Solaris system

Profile

Your user identity for the Tuning Manager server, login, and your email account

R

RAID

Redundant Array of Independent Disks: An assemblage of two or more disk drives to improve fault tolerance or performance

RAID Group

A logical volume consisting of an array of disk drives that uses ports in one or more multiples of 4 channels. Normally this array makes use of striping. This provides good load balancing with a high degree of data availability.

RAID Level

Level of functionality for a RAID subsystem: Level 0: provides data striping (placing blocks of each file across multiple drives). This provides performance benefits but no redundancy. Level 1: provides mirroring where duplicate data is written redundantly to more than one drive. Level 3: provides striping plus error correction. One drive is dedicated to storing error correction data. Level 5: provides byte-level data striping and also stripe error correction.

Raw Devices

Devices not allocated to a filesystem

Read Hit Ratio

The number of transaction hits in the cache within the read transactions, divided by the number of read transactions. (When presented as a percentage, the resulting value is multiplied by 100.)

Read I/O Response Time

The average response time for a read request

Read IOPS

Read operations per second. (This value is aggregated for all sub-resources below the level you have selected in Resource Tree.)

Read Transfer

The speed of data movement for read operations.

Real-time report

A report indicating the current status of a program being monitored

Received Bytes

The quantity of bytes successfully passing through the receiving switch port

Received Frames

The quantity of frames successfully passing through the receiving switch port. (Also see Frame.)

Record ID

An ID used to identify each record of the Tuning Manager products. The record ID is used to specify a record in commands that are executed internally by the Tuning Manager server.

Record Taken

The date and time for the currently displayed polling period

Report

Definitions for displaying performance data collected by an Agent in a graphical format. A report is based mainly on definitions of the records to be displayed in the report, the performance data items to be displayed, and the performance data display format (such as table or graph).

Report Window Setting window

In this window, you can specify the time frames and interval for resource data to be displayed. You can choose a time interval from among the following: by the minute, hourly, daily, weekly, monthly, or yearly.

Resource Tree

A hierarchical presentation of the storage-related and application-related resources monitored by a Tuning Manager server. Resource Tree appears within the Navigation Frame.

Response Time

The I/O Response Time for the time period specified in the Report Window Setting window

Rollback Segments

The number of rollback segments within the tablespace(s). (This value is aggregated for all sub-resources below the level you have selected in Resource Tree.)

S**Serial Number**

Identification code for a hardware subsystem

Series Group

A group of objects that are registered in a combination bookmark and categorized by display format. A series group can be specified by editing a combination bookmark.

Server

Servers are storage-oriented hosts on a network or subnetworks. The Servers metric displays the number of storage hosts at the level you have selected in Resource Tree. (This value is aggregated for all sub-resources below the level you have selected in Resource Tree and averaged over the chosen time period. The result is displayed as an integer value.)

Servers

Servers are storage-oriented hosts on a network or subnetworks. The Servers metric displays the number of storage hosts at the level you have selected in Resource Tree. (This value is aggregated for all sub-resources below the level you have selected in Resource Tree and averaged over the chosen time period. The result is displayed as an integer value.)

Service ID

An ID that uniquely identifies each program included with the Tuning Manager products. The service ID is used to specify a server in commands that are executed internally by the Tuning Manager server. With Performance Reporter, the ID of an Agent is specified in the command argument to display information relevant to that Agent. For information about the service ID, see the applicable Agent manual.

Session

The period of interaction with the software beginning after each new login and ending when you logout

Side File

The area that is temporarily allocated in the cache to store record sets generated during the asynchronous copying process

Side File Usage

The percentage of data being used as a Side File in the cache

Single instance

A record that contains only one instance that is to be evaluated

Size

A measurement of disk capacity or disk space used by the listed resource. (Displayed data indicates the unit of measure employed.)

SLPR

SLPR (storage logical partition) functionality enables partitioning (splitting) of a storage subsystem. The functionality is supported by the Universal Storage Platform V/VM series and Hitachi USP. This functionality splits the resources (ports, CLPR, and volumes) in the storage subsystem, so that the user can manage each resource independently.

SNMP

Simple Network Management Protocol. This is a standard protocol with interfaces for managing and monitoring network resources.

SNMP trap

An event notification issued by an SNMP agent

Solution set

A predefined report format provided for Agents. Solution sets simplify the display of performance data collected by Agents because they can be used without having to specify complex definitions.

Sort Segments

The number of sort segments within the tablespace(s). (This value is aggregated for all sub-resources below the level you have selected in Resource Tree.)

Standby node

A node associated with each server system making up a cluster system that stands by to take over tasks if a failure occurs in the executing node

Storage Subsystem

A physical device containing an array of disk drives acting as a single unit for the purposes of data storage and retrieval

Store database

A database in which performance data collected by an Agent is stored. There is one Store database for each Agent.

Subnet

The name and/or IP range for a subnetwork (a subset of a larger network with its own IP range)

Subnet Capacity

Total storage capacity for a subnetwork

Subnet Capacity History

Total storage capacity for a subnetwork for the time frame you specify

Subnet Mask

A mask value used to obtain the network address of a subnet from an IP address

Subnetwork

A subset of a larger network with its own IP range

Subsystem

The storage subsystem monitored by a Tuning Manager server

Subsystems

The number of storage subsystems monitored by a Tuning Manager server

Switch

Vendor's identifier for the SAN switch

Switch WWN

The unique address for a given switch

Switches

The number of SAN switches at the current resource level

T**Tablespace**

A logical allocation of Oracle capacity dedicated to storing table data

Target

The resource for which information is requested or has been gathered

Trace log

Log information that is collected in case of an error to obtain the details of the error and the duration of the processing event

Transfer

The rate at which data is moved. Also see Read Transfer and Write Transfer.

Transferred Bytes

The quantity of bytes successfully sent from a switch port

Transferred Frames

The quantity of frames successfully sent from a switch port. (Also see Frame.)

Tuning Manager series

Collective name for the Tuning Manager servers and Agents

U**Upper Error Margin**

Upper range of possible values within the current forecast Confidence Level

URL

Uniform Resource Locator: the global address scheme for documents and other resources on the World Wide Web

Used

The portion of capacity consumed

V**Vendor**

The manufacturer/source of the subsystem

Virtual Disk

See Logical Disk

Virtual Logical Disk

A function that connects separate storage subsystems to the Universal Storage Platform V/VM series and Hitachi USP, in order to logically use their Logical Disks as the Logical Disk of the Universal Storage Platform V/VM series and Hitachi USP. This function manages Logical Disks in multiple storage subsystems as the Logical Disk that exists logically in a single storage subsystem.

Volume

Storage organized as either a subset of a single disk or spanning multiple disks

W**Whole Fabric**

Highest resource level in the Tuning Manager server depicting all fabrics in the SAN. (Equivalent to SAN Fabric.) Also see Fabric.

Write Hit Ratio

The number of transaction hits in the cache within the write transactions, divided by the number of writes transactions. (When presented as a percentage, the resulting value is multiplied by 100.)

Write I/O Response Time

The average response time for a write request

Write Pending Rate

The percentage of data in the cache that is waiting to be written

Write IOPS

Write operations per second. (This value is aggregated for all sub-resources below the level you have selected in Resource Tree.)

Write Transfer

The speed of data movement for write operations.

WWN

A 64-bit hexadecimal address (comprising 16 hexadecimal numbers) uniquely identifying devices on a storage area network

WWN Node

A WWN that can be used to identify a device (or interface card such as a host bus adapter) connected to a Fibre Channel network

WWN Port

A port on a WWN Node

X**Xfer**

Transfer rate

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