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Job Management Partner 1 Version 10

Job Management Partner 1/Performance Management - Remote Monitor for Microsoft(R) SQL Server Description, User's Guide and Reference

3021-3-352(E)

■ Relevant program products

Job Management Partner 1/Performance Management - Manager (For Windows):

P-2W2C-AAAL Job Management Partner 1/Performance Management - Manager version 10-00

The above product includes the following:

P-CC242C-AAAL Job Management Partner 1/Performance Management - Manager version 10-00 (For Windows Server 2003)

P-CC2A2C-AAAL Job Management Partner 1/Performance Management - Manager version 10-00 (For Windows Server 2008, Windows Server 2012)

Job Management Partner 1/Performance Management - Manager (For UNIX):

P-812C-AAAL Job Management Partner 1/Performance Management - Manager version 10-00 (For Linux 6 (x86) and Linux 6 (x64))

P-9D2C-AAAL Job Management Partner 1/Performance Management - Manager version 10-00 (For Solaris 10 (SPARC))

P-1M2C-AAAL Job Management Partner 1/Performance Management - Manager version 10-00 (For AIX V6.1 and AIX V7.1)

Job Management Partner 1/Performance Management - Base (For Windows):

P-2W2C-AJAL Job Management Partner 1/Performance Management - Base version 10-00

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P-CC242C-AJAL Job Management Partner 1/Performance Management - Base version 10-00 (For Windows Server 2003)

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Job Management Partner 1/Performance Management - Web Console (For Windows):

P-2W2C-ARAL Job Management Partner 1/Performance Management - Web Console version 10-00

The above product includes the following:

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P-CC2A2C-ARAL Job Management Partner 1/Performance Management - Web Console version 10-00 (For Windows Server 2008, Windows Server 2012)

Job Management Partner 1/Performance Management - Web Console (For UNIX):

P-812C-ARAL Job Management Partner 1/Performance Management - Web Console version 10-00 (For Linux 6 (x64) and Linux 6 (x86))

Job Management Partner 1/Performance Management - Remote Monitor for Microsoft(R) SQL Server (For Windows):

P-2W2C-GEAL Job Management Partner 1/Performance Management - Remote Monitor for Microsoft(R) SQL Server version 10-00

The above product includes the following:

P-CC242C-GEAL Job Management Partner 1/Performance Management - Remote Monitor for Microsoft(R) SQL Server version 10-00 (For Windows Server 2003)

P-CC2A2C-GEAL Job Management Partner 1/Performance Management - Remote Monitor for Microsoft(R) SQL Server version 10-00 (For Windows Server 2008, Windows Server 2012)

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■ Microsoft product name abbreviations

This manual uses the following abbreviations for Microsoft product names.

Abbreviation		Full name or meaning
Internet Explorer		Microsoft(R) Internet Explorer(R)
		Windows(R) Internet Explorer(R)
Microsoft SQL Server		Microsoft(R) SQL Server
MSCS		Microsoft(R) Cluster Server
		Microsoft(R) Cluster Service
Windows Server 2003	Windows Server 2003 (x64)	Microsoft(R) Windows Server(R) 2003, Enterprise x64 Edition
		Microsoft(R) Windows Server(R) 2003, Standard x64 Edition

Abbreviation		Full name or meaning
Windows Server 2003	Windows Server 2003 (x64)	Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition
		Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition
	Windows Server 2003 (x86)	Microsoft(R) Windows Server(R) 2003, Enterprise Edition
		Microsoft(R) Windows Server(R) 2003, Standard Edition
		Microsoft(R) Windows Server(R) 2003 R2, Enterprise Edition
		Microsoft(R) Windows Server(R) 2003 R2, Standard Edition
Windows Server 2008	Windows Server 2008 Datacenter	Microsoft(R) Windows Server(R) 2008 R2 Datacenter
	Windows Server 2008 Enterprise	Microsoft(R) Windows Server(R) 2008 Enterprise
		Microsoft(R) Windows Server(R) 2008 Enterprise without Hyper-V(TM)
		Microsoft(R) Windows Server(R) 2008 R2 Enterprise
	Windows Server 2008 Standard	Microsoft(R) Windows Server(R) 2008 Standard
		Microsoft(R) Windows Server(R) 2008 Standard without Hyper-V(TM)
		Microsoft(R) Windows Server(R) 2008 R2 Standard
Windows Server 2012		Microsoft(R) Windows Server(R) 2012 Datacenter
		Microsoft(R) Windows Server(R) 2012 Standard
Win32		Win32(R)

Windows is sometimes used generically, referring to Windows Server 2012, Windows Server 2008, and Windows Server 2003.

If the OS you are using is Windows Server 2012, read all instances of "Windows Server 2008" in the manual body as "Windows Server 2012".

■ Restrictions

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Jun. 2013: 3021-3-352(E)

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Preface

This manual describes the functionality and records of Job Management Partner 1/Performance Management - Remote Monitor for Microsoft(R) SQL Server. Note that in this manual, *Job Management Partner 1* is abbreviated to *JP1*.

■ Intended readers

This manual is intended for the following readers:

- Users who wish to design or construct an operation monitoring system.
- Users who wish to define conditions for collecting performance data.
- Users who wish to define reports and alarms.
- Users who wish to use collected performance data to monitor a system.
- Users who wish to consider or take actions for a system based on monitoring results.

Readers are assumed to be familiar with Microsoft(R) SQL Server and the operation of the system being monitored, and to have a knowledge of the OS.

For details about how to design and run systems that use JP1/Performance Management, also see the following manuals:

- *Job Management Partner 1 Version 10 Job Management Partner 1/Performance Management Planning and Configuration Guide* (3021-3-347(E))
- *Job Management Partner 1 Version 10 Job Management Partner 1/Performance Management User's Guide* (3021-3-348(E))
- *Job Management Partner 1 Version 10 Job Management Partner 1/Performance Management Reference* (3021-3-349(E))

■ Organization of this manual

This manual consists of the following parts, and is a common reference for the following supported OSs: Windows Server 2003, Windows Server 2008, and Windows Server 2012. Any platform-dependent differences are noted separately in the manual.

Part *1. Overview*

This part provides an overview of JP1/Performance Management - Remote Monitor for Microsoft(R) SQL Server.

Part *2. Configuration and Operations*

Part 2 describes how to install and set up JP1/Performance Management - Remote Monitor for Microsoft(R) SQL Server, and how to run the program in a cluster system.

Part *3. Reference*

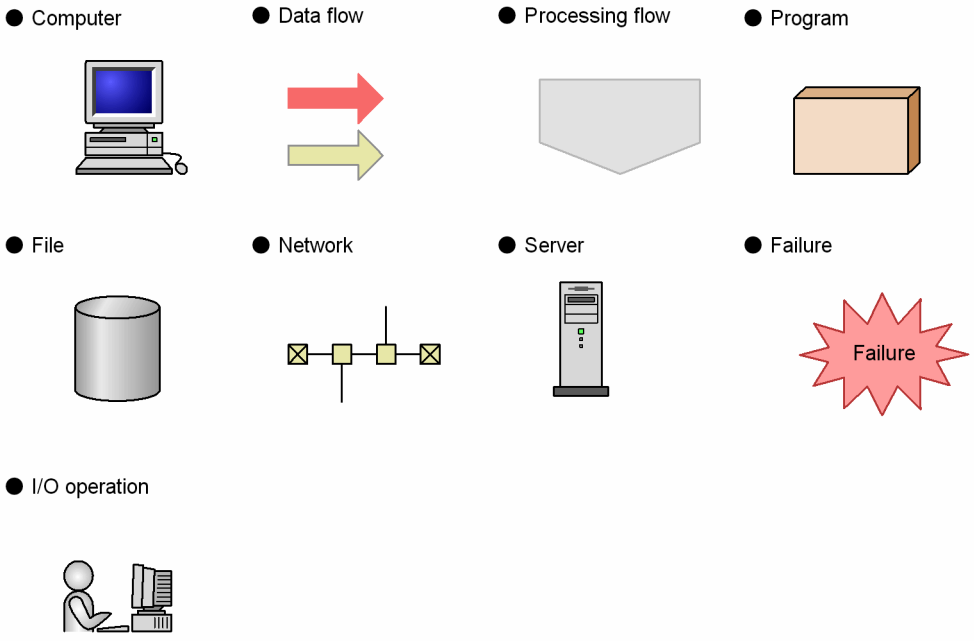
This part describes the monitoring template, records, and messages of JP1/Performance Management - Remote Monitor for Microsoft(R) SQL Server.

Part *4. Troubleshooting*

This part describes the actions to be taken for errors that might occur during operation of JP1/Performance Management - Remote Monitor for Microsoft(R) SQL Server.

■ Conventions: Diagrams

This manual uses the following conventions in diagrams:



■ Conventions: Fonts and symbols

Font and symbol conventions are classified as:

- General font conventions
- Conventions in syntax explanations

These conventions are described below.

General font conventions

The following table lists the general font conventions:

Font	Convention
Bold	Bold type indicates text on a window, other than the window title. Such text includes menus, menu options, buttons, radio box options, or explanatory labels. For example, bold is used in sentences such as the following: • From the **File** menu, choose **Open**. • Click the **Cancel** button. • In the **Enter name** entry box, type your name.
Italics	Italics are used to indicate a placeholder for some actual text provided by the user or system. Italics are also used for emphasis. For example: • Write the command as follows: `copy` *source-file target-file* • Do *not* delete the configuration file.
`Code font`	A code font indicates text that the user enters without change, or text (such as messages) output by the system. For example: • At the prompt, enter `dir`. • Use the `send` command to send mail. • The following message is displayed: `The password is incorrect.`

Examples of coding and messages appear as follows (although there may be some exceptions, such as when coding is included in a diagram):

```
MakeDatabase
...
StoreDatabase temp DB32
```

In examples of coding, an ellipsis (...) indicates that one or more lines of coding are not shown for purposes of brevity.

Conventions in syntax explanations

Syntax definitions appear as follows:

Store**D**atabase [A|B] {C|D|E} (*database-name* ...)

The following table lists the conventions used in syntax explanations.

Example font or symbol	Convention
StoreDatabase	The user should enter code-font characters exactly as shown.
database-name	In actual commands the user must replace the italics by suitable characters.
SD	Bold code-font characters indicate an abbreviation for a command.
A	The underlined characters are the system default when you omit all the items enclosed in brackets. Example: [A|B] indicates that the system uses A if you do not specify either A or B.
|	Only one of the options separated by a vertical bar can be used at one time. Example: A|B|C indicates A, or B, or C.
{ }	One of the items enclosed in braces and separated by a vertical bar must be specified. Example: {C|D|E} indicates that one of the items from C, or D, or E must be specified.
[ ]	The item or items enclosed in brackets are optional. Example: [A] indicates the specification of A or nothing. [B|C] indicates the specification of B or C, or nothing.
...	The item or items preceding the ellipsis (...) can be repeated. To specify multiple items, use a one-byte space to delimit them. Example: A B ... indicates that B can be specified as many times as necessary after A.
( )	The items enclosed by the parentheses are in the range to which | or ... are applied.

■ Conventions: Mathematical expressions

The following table lists conventions used in mathematical expressions:

Symbol	Description
×	Multiplication
/	Division

■ Conventions: Version numbers

The version numbers of Hitachi program products are usually written as two sets of two digits each, separated by a hyphen. For example:

- Version 1.00 (or 1.0) is written as 01-00.
- Version 2.05 is written as 02-05.
- Version 2.50 (or 2.5) is written as 02-50.
- Version 12.25 is written as 12-25.

The version number might be shown on the spine of a manual as *Ver. 2.00,* but the same version number would be written in the program as *02-00*.

Contents

Part 1: Overview

Part 2: Configuration and Operations

1 Overview of PFM - RM for Microsoft SQL Server

This chapter provides an overview of PFM - RM for Microsoft SQL Server.

1.1 Features of PFM - RM for Microsoft SQL Server

PFM - RM for Microsoft SQL Server has the following features:

- Ability to monitor the target hosts agentlessly.

  One PFM - RM for Microsoft SQL Server remotely monitors Microsoft SQL Server performances on the multiple target hosts.
- Ability to analyze the operating status of Microsoft SQL Server

  PFM - RM for Microsoft SQL Server provides the information needed for easy analysis of the operating status of Microsoft SQL Server. It does so by collecting and summarizing performance data (such as session statistics) obtained from the Microsoft SQL Server instance being monitored, and then graphically displaying any trends or changes.
- Ability to detect Microsoft SQL Server problems and quickly provide the information needed to identify the cause of a problem

  In the event of a problem, such as a malfunction in a session on the Microsoft SQL Server system being monitored, PFM - RM for Microsoft SQL Server alerts the user to the problem at an early stage by using email or other means to notify the user. PFM - RM for Microsoft SQL Server also provides a graphical display of the information needed to identify the cause of a problem.

To use PFM - RM for Microsoft SQL Server, you must also install the programs PFM - Manager, and PFM - Web Console.

The following subsections summarize the functions of PFM - RM for Microsoft SQL Server.

1.1.1 Monitor the multiple target hosts agentlessly

PFM - RM for Microsoft SQL Server remotely monitors the Microsoft SQL Server performance.

This "*remote monitoring*" means the function for the other hosts than the Microsoft SQL Server hosts to monitor the Microsoft SQL Server operating status even though you do not install any agent programs on the monitoring target Microsoft SQL Server hosts.

Since the installation of PFM - RM for Microsoft SQL Server on the monitored host is not required, you can monitor the performance data without changing the system configuration of the target server (or host). One PFM - RM for Microsoft SQL Server can monitor the performance data of the multiple Microsoft SQL Server hosts.

Note that in Performance Management the target host of PFM - RM for Microsoft SQL Server is called "*monitored host*".

For details about the supported Microsoft SQL Server programs, see *2.1.1(4)(a) Programs that can be monitored*.

1.1.2 Collecting Microsoft SQL Server performance data

PFM - RM for Microsoft SQL Server enables you to collect performance data (statistical data such as the usage ratio of the database space and the cache hit rate) on the current Microsoft SQL Server session on the host being monitored.

Note

- Performance data containing characters other than Shift-JIS (for Japanese Windows) or GB18030 (for Sinplified-Chinese Windows) or 7-bit ASCII(for other Windows) cannot be collected in PFM - RM for Microsoft SQL Server.
- PFM - RM for SQL Server collects performance data of the record field size from Microsoft SQL Server. Therefore, if Microsoft SQL Server contains data that exceeds the field size, the last character of the performance data might be unreadable. The following table lists the applicable fields:

  Table 1-1: Field of the performance data might be unreadable

Recode name	Field name
Instance Availability (PD_IA)	Message
Lock Detail (PD_LD)	User

Recode name	Field name
Process Detail (PD_PDET)	User

With PFM - RM for Microsoft SQL Server, you can use the collected performance data as follows:

- To graphically display the operating status of Microsoft SQL Server

  By using PFM - Web Console, you can process and display performance data in a graphical format called a *report*. A report facilitates the analysis of the Microsoft SQL Server operating status.

  There are two types of reports:

  - *Real-time reports*

    A real-time report indicates the current status of a Microsoft SQL Server system being monitored. It is used primarily to check the current status of the system and to detect problems in the system. To display real-time reports, PFM - RM for Microsoft SQL Server uses current performance data that has just been collected.

  - *Historical reports*

    A historical report indicates the status of a Microsoft SQL Server system being monitored from a selected point of time in the past to the present. It is used primarily to analyze trends in the system. To display a historical report, the system uses performance data that has been stored in a database for PFM - RM for Microsoft SQL Server.

- As criteria for determining whether a problem has occurred

  You can set PFM - RM for Microsoft SQL Server to take some action (such as notifying the user) if collected performance data indicates an abnormal condition.

1.1.3 Collecting performance data based on its characteristics

PFM - RM for Microsoft SQL Server collects performance data in *records*. Each record consists of smaller units called *fields*. Collectively, the records and fields are referred to as the *data model*.

Records are classified into two types according to their characteristics. These record types are predefined in PFM - RM for Microsoft SQL Server. The user simply uses PFM - Web Console to specify the performance data records to be collected.

PFM - RM for Microsoft SQL Server supports the following two record types:

- *Product Interval record type* (referred to hereafter as the *PI record type*)

  For records of the PI record type, the system collects performance data for a specified interval, such as the number of processes executed in one minute. You can use these records to analyze the changes or trends in the system status over time.

- *Product Detail record type* (referred to hereafter as the *PD record type*)

  For records of the PD record type, the system collects 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.

For more information about record types, see *5. Records*

1.1.4 Saving performance data

Because collected performance data is stored in a special database, you can save performance data up to the current date, and use it to analyze trends (from a selected point in the past to the current date) in the Microsoft SQL Server operating states. This special database is called the *Store database* of PFM - RM for Microsoft SQL Server. Trends are analyzed using historical reports.

Use PFM - Web Console to select the performance data records to be stored in the Store database. For details about how to select records with PFM - Web Console, see the chapter on the management of operation monitoring data in the *Job Management Partner 1/Performance Management User's Guide*.

1.1.5 Notifying users of problems in Microsoft SQL Server operation

In addition to using performance data collected by PFM - RM for Microsoft SQL Server to display Microsoft SQL Server performance as reports, you can also use it to warn the user of a problem or error occurring during Microsoft SQL Server operation.

Suppose that you wish to notify the user by email whenever the percentage of cache hit rate is less than 85%. You can do this by setting *percentage of cache hit rate is less than 85%* as the abnormal condition threshold, and setting the system to send an email to the user when this threshold is reached. What the system does when the threshold is reached is called an *action*. The following types of actions are available:

- Sending an email
- Executing a command
- Issuing an SNMP trap
- Issuing a JP1 event

The definition of a threshold or action is called an *alarm*. A table of defined alarms is called an *alarm table.* Once an alarm table is defined, it is associated with PFM - RM for Microsoft SQL Server. Associating an alarm table with PFM - RM for Microsoft SQL Server is called *binding*. Once an alarm table has been bound to PFM - RM for Microsoft SQL Server, whenever the performance data collected by PFM - RM for Microsoft SQL Server reaches the threshold defined as an alarm, the event is reported to the user.

By defining alarms and actions, you can detect Microsoft SQL Server problems at an early stage and take appropriate action.

For details about how to set alarms and actions, see the chapter on alarm-based operation monitoring in the *Job Management Partner 1/Performance Management User's Guide*.

1.1.6 Easy definition of alarms and reports

PFM - RM for Microsoft SQL Server provides a *monitoring template* that contains predefined information necessary for standard reports and alarms. The *monitoring template* facilitates setup for monitoring the Microsoft SQL Server operating status, because it does not require you to make any complicated definitions. You can also customize the monitoring template as needed for your environment. For details about how to use the *monitoring template*, see the chapter on creating reports for operation analysis or the chapter on alarm-based operation monitoring in the *Job Management Partner 1/Performance Management User's Guide*. For details about the *monitoring template*, see Part 3, *4. Monitoring Template*.

1.1.7 Operation with a cluster system

By using a cluster configuration, you can create a highly reliable system that continues to operate even in the event of a system failure. As a result, the programs in Performance Management can continue operation and monitoring 24 hours a day.

There are two methods to operate PFM - RM for Microsoft SQL Server in an HA cluster system:

- Operate PFM - RM for Microsoft SQL Server when Microsoft SQL Server operates in an HA cluster system.
- Operate PFM - RM for Microsoft SQL Server in an HA cluster system.

The following figure shows an example of operation when a problem occurs on the monitored host in a cluster system.

Figure 1-1: Example of PFM - RM for Microsoft SQL Server monitoring Microsoft SQL Server in an HA cluster system

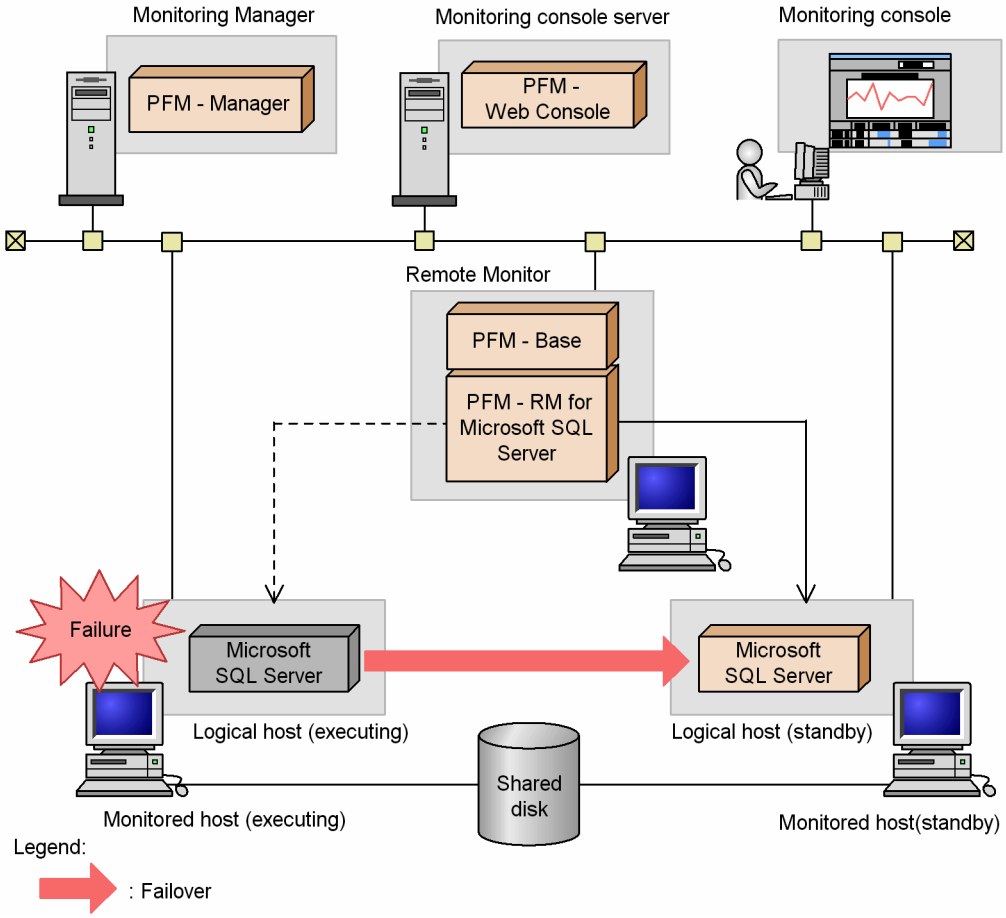
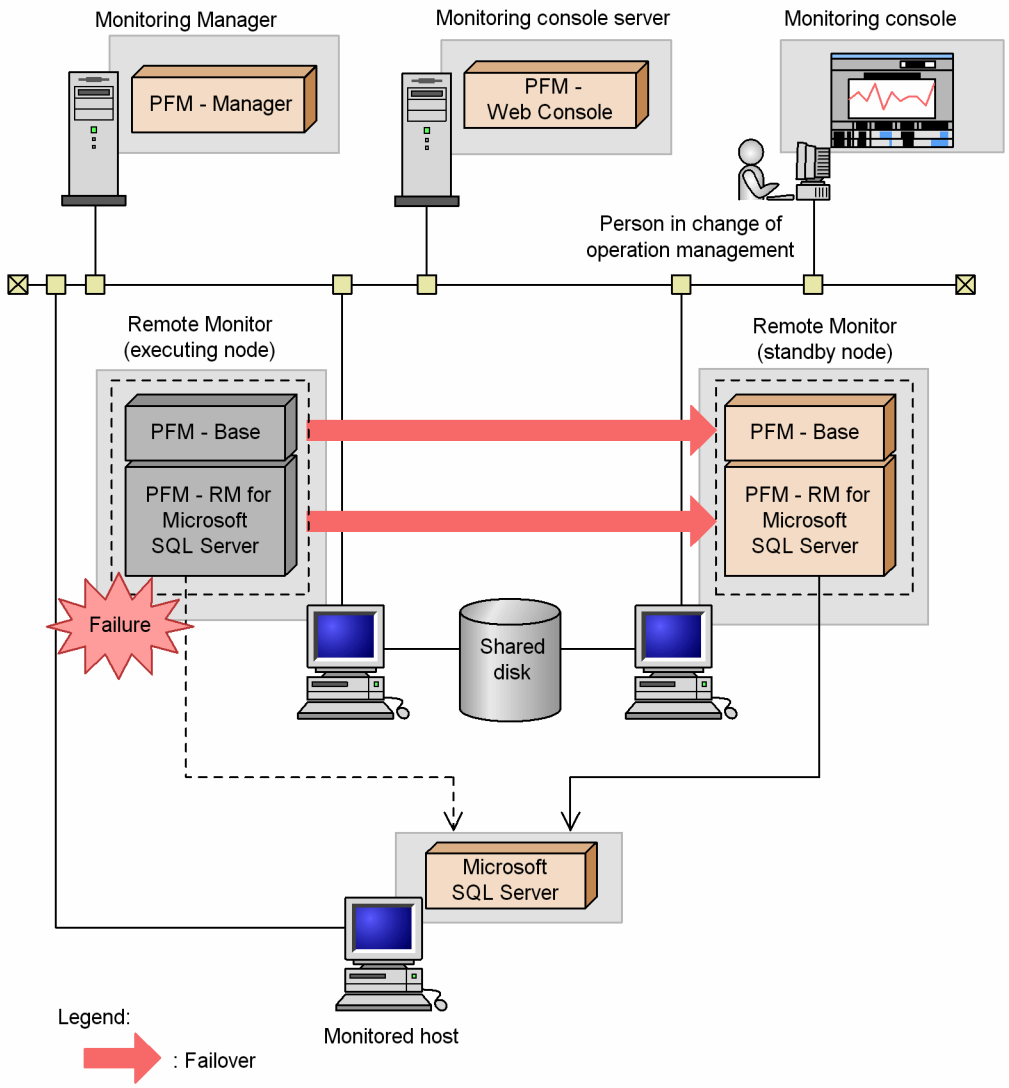


Figure 1-2: Example of an PFM - RM for Microsoft SQL Server configuration in an HA cluster system



For more details about running the programs in Performance Management on a cluster system, see Part 2, *3. Operating PFM - RM for Microsoft SQL Server in a Cluster System*.

1.2 Overview of collection and management of performance data

The procedures for collecting and managing performance data depend on the record type used to store the performance data. The records for PFM - RM for Microsoft SQL Server are classified into the following two types:

- PI record type
- PD record type

For details about how to collect and manage performance data, see the following sections:

- Performance data collection procedure

  For details about the performance data collection procedure, see the chapter on Performance Management functionality in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

  For details about the values of the collected performance data, see *5. Records*.
- Performance data management procedure

  For details about the performance data management procedure, see the chapter on Performance Management functionality in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

When you want to select performance data from the records collected and managed by PFM - RM, you use PFM - Web Console. For details about how to select performance data, see the chapter on the management of operation monitoring data in the *Job Management Partner 1/Performance Management User's Guide*.

1.3 Example of performance monitoring using PFM - RM for Microsoft SQL Server

Performance monitoring is critical for the setup and management of Microsoft SQL Server environments. The following explains the purpose of performance monitoring using PFM - RM for Microsoft SQL Server, and provides an example of performance monitoring.

Performance monitoring using PFM - RM for Microsoft SQL Server can be used to perform the following:

- Analysis of performance data to discover causes of bottlenecks
- Monitoring to check whether the Microsoft SQL Server is running properly

During Microsoft SQL Server operation, specific causes can negatively impact overall Microsoft SQL Server performance. These causes can include the following:

- Insufficient data cache
- CPU usage ratio per session
- Insufficient log space
- Insufficient database space
- Increase in the number of locks

It is very important to make sure that the Microsoft SQL Server is running properly. In addition to performance standpoints, monitoring such as the following can be used to check whether a Microsoft SQL Server is running properly.

- Network load monitoring
- Instance validity

Performance monitoring using PFM - RM for Microsoft SQL Server can be performed to achieve stable operation for Microsoft SQL Server servers.

Note that the performance monitoring method thresholds are for reference only. The actual thresholds need to be determined through baseline measurement.

The actual items set need to be determined based on the type of operation for the Microsoft SQL Server.

1.3.1 Determining a baseline

Determining a baseline involves using the results of performance measurement to calculate the line at which no system operation problems are anticipated.

Performance Management products treat baseline values as *thresholds* for system operation monitoring. As such, determining a baseline is important for deciding on a threshold and performing performance monitoring.

Hitachi recommends that you perform the following when you determine a baseline:

- Measuring statuses during peak times, such as by performing testing under heavy operation environment load
- Re-measure baselines when system resources or operation environments are changed, as these can differ significantly by system configuration

1.3.2 Insufficient data cache

The insufficient data cache affects the performance of the Microsoft SQL Server. To monitor the insufficient data cache, use the Cache Usage alarm in the monitoring template which PFM - RM for Microsoft SQL Server provides. The Cache Usage alarm enables you to monitor how many times the cache hits occur instead of loading data from the storage disk

The following table explains the Cache Usage alarm in the monitoring template:

Alarm name	Record used	Field used	Abnormal condition	Warning condition	Values measured
Cache Usage	PI_SERV	Cache Hit %	Cache Hit % < 85	Cache Hit % < 95	The data cache can be insufficient.

Diagnosis:

If the value of Cache Hit % field is lower than 85 %, the data cache can be insufficient.

The insufficient data cache lowers the performance of the search and update process.

Prescription:

Either increase the value of the max server memory option or add the physical memory to the system so that the size of the data cache increases.

For details about the Cache Usage alarm, see *Cache Usage* in *4. Monitoring Template*.

1.3.3 CPU usage ratio per session

The CPU usage ratio per session may affect the performance of the Microsoft SQL Server. To monitor the CPU usage ratio per session, use the CPU Usage alarm in the monitoring template which PFM - RM for Microsoft SQL Server provides. The CPU Usage alarm enables you to monitor the top 10 most CPU-cycle used sessions at present.

The following table explains the CPU Usage alarm in the monitoring template:

Alarm name	Record used	Field used	Abnormal condition	Warning condition	Values measured
CPU Usage	PI	CPU %	CPU % > 90	CPU % > 80	Microsoft SQL Server can be too busy.

Diagnosis:

If the value of CPU % field exceeds 90 %, the system can be too busy.

Prescription:

Remove what makes the system too busy to lessen the system load.

For details about the CPU Usage alarm, see *CPU Usage* in *4. Monitoring Template*.

1.3.4 Insufficient log space

The insufficient log space affects the performance of the Microsoft SQL Server. To monitor the insufficient log space, use the Log Space Usage alarm which PFM - RM for Microsoft SQL Server provides. The Log Space Usage alarm enables you to monitor the top 10 most log-space used database.

The following table explains the Log Space Usage alarm in the monitoring template:

Alarm name	Records used	Field used	Abnormal condition	Warning condition	Values measured
Log Space Usage	PI_TLOG	Log Space Used %	Log Space Used % > 90	Log Space Used % > 80	Log space can be insufficient.

Diagnosis:

If the value of Log Space Used % exceeds 90 %, the log space can be insufficient.

Prescription:

Add a transaction log file or enlarge the size of the transaction log file.

For details about the Log Space Usage alarm, see *Log Space Usage* in *4. Monitoring Template*.

1.3.5 Insufficient database space

The insufficient database space affects the performance of the Microsoft SQL Server. To monitor the insufficient database space, use the Database Space alarm which PFM - RM for Microsoft SQL Server provides. The Database Space alarm enables you to monitor the available space for each database.

The following table explains the Database Space alarm in the monitoring template:

Alarm name	Record used	Field used	Abnormal condition	Warning condition	Values measured
Database Space	PD_DS	Free %	Free % < 10	Free % < 20	Available space for database can be insufficient.

Diagnosis:

If the value of Database Space is less than 10 %, the available space for databases can be insufficient.

Prescription:

Reconsider how to access the Microsoft SQL Server database

For details about the Database Space alarm, see *Database Space* in *4. Monitoring Template*.

1.3.6 Increase in the number of locks

The increase in the number of locks affects the performance of the Microsoft SQL Server. To monitor the increase in the number of locks, use the Blocked Sessions alarm in the monitoring template which PFM - RM for Microsoft SQL Server provides. The Blocked Sessions alarm monitors the number of sessions that are waiting for lock release by other sessions.

The following table explains the Blocked Sessions alarm in the monitoring template:

Alarm name	Record used	Field used	Abnormal condition	Warning condition	Values measured
Blocked Sessions	PD	Blocked Processes	Blocked Processes > 2	Blocked Processes > 0	The sessions that set the locks can be running.

Diagnosis:

If the value of the `Blocked Sessions` alarm exceeds 2, the sessions that set the locks can be running.

Prescription:

Check the active sessions connecting to the Microsoft SQL Server.

For details about the Blocked Sessions alarm, see *Blocked Sessions* in *4. Monitoring Template*.

1.3.7 Network load

Network load affects the performance of the Microsoft SQL Server. To monitor network load, use the Network Error alarm in the monitoring template provided by PFM - RM for Microsoft SQL Server. The Network Error alarm enables you to monitor how Microsoft SQL Server operation affects the network.

The following table explains the Network Error alarm in the monitoring template:

Alarm name	Record used	Field used	Abnormal condition	Warning condition	Values measured
Network Error	PD	Pkt Errors	Pkt Errors > 2	Pkt Errors > 0	The Microsoft SQL Server might significantly increase network load.

Diagnosis:

If the value of the `Network Error` alarm exceeds 2, the Microsoft SQL Server might significantly increase network load.

Prescription:

Modify network access to the Microsoft SQL Server or the system configuration related to the network.

1.3.8 Instance validity

To monitor whether a Microsoft SQL Server instance is valid, use the Server Status alarm in the monitoring template provided by PFM - RM for Microsoft SQL Server. The Server Status alarm enables you to monitor the validity of a Microsoft SQL Server instance.

The following table explains the Server Status alarm in the monitoring template:

Alarm name	Record used	Field used	Abnormal condition	Warning condition	Values measured
`Server Status`	`PD_IA`	`Availability`	`Availability = 0`	`Availability = 0`	The Microsoft SQL Server instance might be invalid.

Diagnosis:

If the value of `Availability` is 0 (stopped), the Microsoft SQL Server instance might be invalid.

Prescription:

Check whether a connection to the Microsoft SQL Server can be established. If the connection cannot be established, modify the environment that communicates with Microsoft SQL Server. If you cannot identify any problems in the communication environment, check the status of the Microsoft SQL Server service.

For details about the Server Status alarm, see *Server Status* in *4. Monitoring Template*.

2 Installation and Setup

This chapter describes the procedures for installing and setting up PFM - RM for Microsoft SQL Server. For details about how to install and set up an entire system that operates the programs of the Performance Management products, see the chapter that describes installation and setup for Windows in the *Job Management Partner 1/ Performance Management Planning and Configuration Guide*.

2.1 Installation and setup

This section describes the procedures for installing and setting up PFM - RM for Microsoft SQL Server.

2.1.1 Preparation for installing and setting up PFM - RM for Microsoft SQL Server

Check the following items before installing and setting up PFM - RM for Microsoft SQL Server.

(1) OS requirements

PFM - RM for Microsoft SQL Server can run on the following operating systems (OSs):

- Windows Server 2003#
- Windows Server 2008#

#

On Windows Server 2003 (x64) and the 64-bit version of Windows Server 2008, PFM - RM for Microsoft SQL Server operates on WOW64.

(2) Network environment settings

To operate PFM - RM for Microsoft SQL Server with Performance Management, you need to set the network environment such as the IP address or port number.

(a) IP address settings

When the OS is Windows Server 2008 R2 and Windows Server 2012, PFM - RM for Microsoft SQL Server can run in an IPv6 environment and dual stack environment in addition to an IPv4 environment.

In a Windows system, set up the environment so that an IP address can be resolved from the host name returned by the `hostname` command.For details about the configuration of a monitoring host name, see the chapter on installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.Note that the IP addresses set in the `jpchosts` file are not used for the IP address resolving the addresses of monitoring targets.

Use one of the following methods to set the host name and IP address of a host monitored by Performance Management programs:

- Host information settings file for Performance Management (`jpchosts` file)
- `hosts` file
- DNS (Domain Name System)

Use one of the following methods to set the host name and IP address of a host monitored by PFM - RM for Microsoft SQL Server:

- `hosts` file
- DNS (Domain Name System)

Notes:

- Although the Performance Management programs and PFM - RM for Microsoft SQL Server can operate in a DNS environment, they do not support host names in FQDN (Fully Qualified Domain Name) format. When you specify an IP address, use the host name returned by the `hostname` command after removing the domain name portion.
- If you intend to use Performance Management within multiple LAN environments, set the IP addresses in the `jpchosts` file. For details, see the chapter on installation and setup in the *Job Management Partner 1/ Performance Management Planning and Configuration Guide*.

- Performance Management programs cannot operate on the hosts to which IP addresses are assigned dynamically by DHCP. Make sure that all the hosts on which Performance Management programs are installed are configured with user-specific static IP addresses.

(b) Settings when IPv6 used

Performance Management supports IPv6 environments as well as IPv4 environments as a network configuration. Therefore, Performance Management can operate even in a network configuration in which both an IPv4 environment and an IPv6 environment are used.

PFM - RM for Microsoft SQL Server can communicate with PFM - Manager via IPv6.

Note that this explanation applies only when the OS of a host on which PFM - RM for Microsoft SQL Server is installed is Windows Server 2008 R2 or Windows Server 2012, and the OS of a host on which PFM - Manager is installed is Windows Server 2008 R2, Windows Server 2012, or Linux.

For details about the scope of communication in an environment with both IPv4 and IPv6, see *L. About Communication in IPv4 Environments and IPv6 Environments*.

When you want to use IPv6 for communication, the settings for using IPv6 need to be enabled on both the PFM - Manager host and the PFM - RM host. You can specify the settings by executing the `jpcconf ipv6 enable` command. The following describes when the command needs to be executed and when it does not need to be executed.

Cases when the `jpcconf ipv6 enable` command needs to be executed:

- When switching from an IPv4 environment to an IPv6 environment on each host
- When switching the PFM - Manager environment from IPv4 to IPv6 in an environment in which both IPv4 and IPv6 are used

Cases when the `jpcconf ipv6 enable` command does not need to be executed:

- When each host already operates in an IPv6 environment
- When PFM - Manager operates in an IPv6 environment in an environment in which both IPv4 and IPv6 are used

The following shows an example of executing the `jpcconf ipv6 enable` command:

```
jpcconf ipv6 enable
```

For details about the `jpcconf ipv6 enable` command, see the chapter that describes commands in the manual *Job Management Partner 1/Performance Management Reference*. For details about the conditions or occasions for executing the `jpcconf ipv6 enable` command, see the chapter that describes network configuration examples in an environment that includes IPv6 in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

When you use IPv6 for communication between a monitored host and PFM - RM for Microsoft SQL Server, specify the name of a monitored host where name resolution can be performed.

Communication between PFM - RM for Microsoft SQL Server and a monitoring target is performed with an IP address that can be resolved. Also, if an IPv4 environment and an IPv6 environment are both used, and communication between PFM - RM for Microsoft SQL Server and the monitoring target fails with an IP address that can be resolved, the communication is not retried by using another IP address.

For example, if communication fails when IPv4 is used, IPv6 is not used to retry communication. Similarly, if communication fails when IPv6 is used, IPv4 is not used to retry communication. Make sure beforehand that a connection can be established.

(c) Port number settings

The following table shows the default port numbers assigned to the services of Performance Management programs. For other services and programs, available port numbers are automatically assigned each time the services and programs are started. If you use Performance Management in a firewall environment, use fixed port numbers. For details about how to set fixed port numbers, see the chapter on installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

Table 2-1: Default port number of each service

Service description	Service name	Parameter	Port number	Remarks
Service configuration information management function	Name Server	jp1pcnsvr	22285	The port number used by the Name Server service of PFM - Manager. This port is set up on every Performance Management host.
OpenView linkage facility	NNM Object Manager	jp1pcovsvr	22292	The port number used by the OpenView linkage facility of PFM - Manager and PFM - Base to provide communication between the map manager and object manager. This port is set up on the hosts on which PFM - Manager and PFM - Base are installed.
Service status management function	Status Server	jp1pcstatsvr	22350	The port number used by the Status Server service of PFM - Manager and PFM - Base. This port is set up on the hosts on which PFM - Manager and PFM - Base are installed.
Monitoring console communication facility	View Server	jp1pcvsvr	22286	The port number used by the View Server service of PFM - Manager. This port is set up on the hosts on which PFM - Manager is installed.
Web service facility	Web Service	--	20358	The port number used by the Web Service service of PFM - Web Console.
Web container facility	Web Console	--	20359 20360	The port number used by the Web Console service of PFM - Web Console.
JP1/ITSLM linkage facility	JP1/ITSLM	--	20905	The port number set by JP1/ITSLM.

Legend:

--: None

Ensure that the network is set up to allow communication using these port numbers, since they are used by PFM - RM for Microsoft SQL Server.

(3) OS user permission for installing PFM - RM for Microsoft SQL Server

When installing PFM - RM for Microsoft SQL Server, always use an account that belongs to the Administrators group.

(4) Prerequisite programs

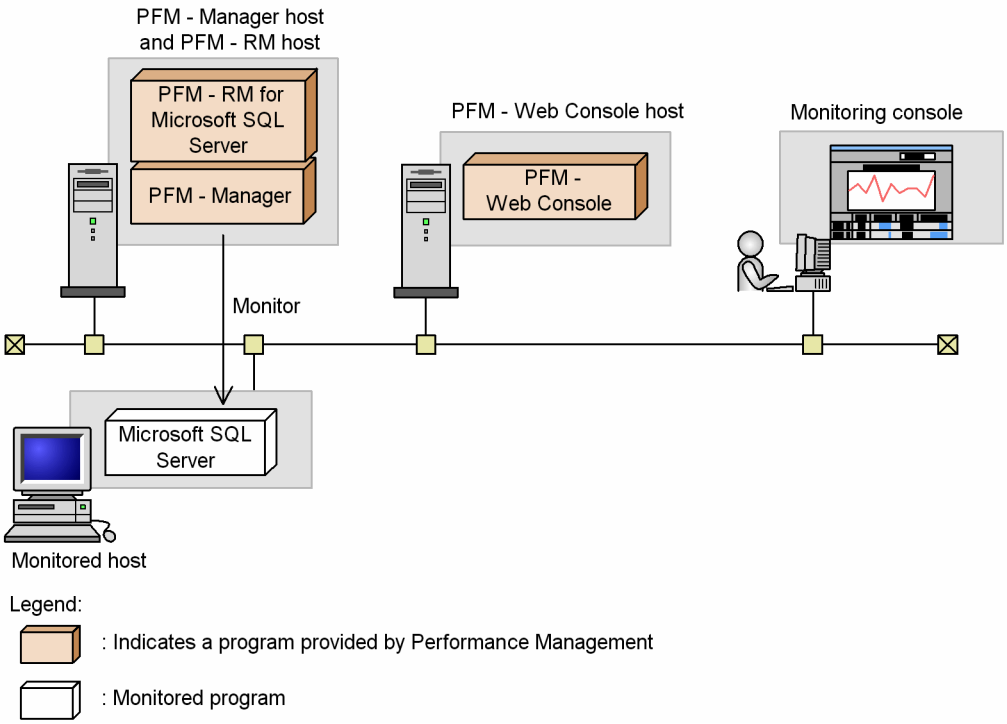
This subsection describes the prerequisite programs for installing PFM - RM for Microsoft SQL Server.

The host on which PFM - RM for Microsoft SQL Server is installed is hereafter called "PFM - RM host".There are roughly two cases in the program configuration of PFM - RM for Microsoft SQL Server. The actual program configuration needs to be determined based on the system configuration.

Install PFM - RM for Microsoft SQL Server on the PFM - Manager host

This configuration is the program configuration for installing PFM - RM for Microsoft SQL Server on the same host on which PFM - Manager is installed. The following figure 2-1 shows the program configuration in this case:

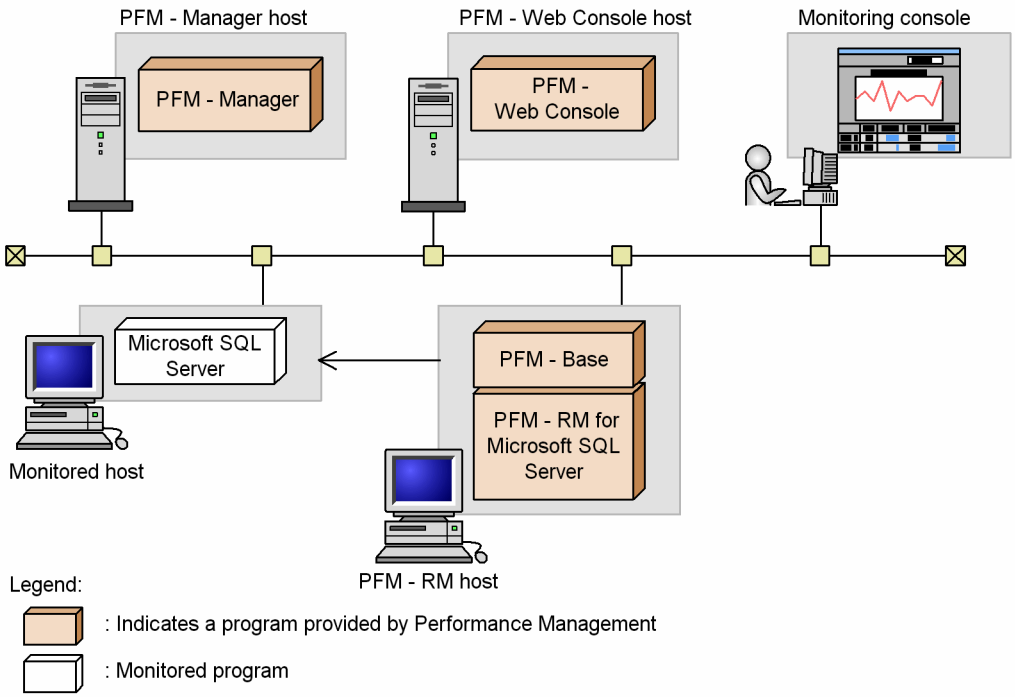
Figure 2-1: Program configuration (Installation of PFM - RM for Microsoft SQL Server on the PFM - Manager host)



Install PFM - RM for Microsoft SQL Server on the different host from PFM - Manager host

This configuration is the program configuration for installing PFM - RM for Microsoft SQL Server on the different host from PFM - Manager host. In this program configuration, you need to install PFM - Base in advance on the same host on which PFM - RM for Microsoft SQL Server is installed. The following figure 2-2 shows the program configuration in this case:

Figure 2-2: Program configuration (installation of PFM - RM for Microsoft SQL Server on the same host on which PFM - Base is installed)



(a) Programs that can be monitored

PFM - RM for Microsoft SQL Server can monitor the following programs:

Windows Server 2003:

- Microsoft SQL Server 2005 Enterprise Edition
- Microsoft SQL Server 2005 Standard Edition
- Microsoft SQL Server 2008 Enterprise Edition
- Microsoft SQL Server 2008 Standard Edition
- Microsoft SQL Server 2008 R2 Enterprise Edition
- Microsoft SQL Server 2008 R2 Standard Edition

Windows Server 2008:

- Microsoft SQL Server 2005 Enterprise Edition (SP2 or later)
- Microsoft SQL Server 2005 Standard Edition (SP2 or later)
- Microsoft SQL Server 2008 Enterprise Edition
- Microsoft SQL Server 2008 Standard Edition
- Microsoft SQL Server 2008 R2 Enterprise Edition
- Microsoft SQL Server 2008 R2 Standard Edition
- Microsoft SQL Server 2012 Enterprise Edition
- Microsoft SQL Server 2012 Business Intelligence
- Microsoft SQL Server 2012 Standard

(b) Performance Management programs

Install PFM - RM for Microsoft SQL Server and PFM - Base on the PFM - RM host. PFM - Base is a prerequisite program for PFM - RM for Microsoft SQL Server. Only one instance of PFM - Base is required, even when multiple instances of PFM - RM for Microsoft SQL Server are installed on one host.

Note that you do not need to install PFM - Base if PFM - Manager and PFM - RM for Microsoft SQL Server are installed on the same host.

To use PFM - RM for Microsoft SQL Server to monitor Microsoft SQL Server operation, PFM - Manager and PFM - Web Console are required.

(5) Installation and setup in a cluster system

When you install and set up PFM - RM in a cluster system, the prerequisite network environment and program configuration is different from those for a normal system. There are also additional tasks that must be performed on the executing nodes and standby nodes. For details, see *3. Operating PFM - RM for Microsoft SQL Server in a Cluster System*.

(6) Preparation for collecting data when an error occurs

If a problem occurs, memory dumps, crash dumps, user mode process dumps, and other data might be required. To obtain these dumps when a problem has occurred, set output of these dumps in advance by using one of the following methods.

(a) Setting method for Windows Server 2003

- Settings for outputting memory dumps

  1. In **Control Panel**, double-click **System**.
  2. On the **Advanced** page, click the **Settings** button for **Startup and Recovery**.
  3. In **Write debugging information**, select **Complete Memory Dump** and then specify the output destination file.

Important note

The size of a memory dump differs according to the size of actual memory. The greater the increase in the installed physical memory, the greater the increase in the memory dump size. Accordingly, make sure you secure enough disk space to collect memory dumps. For details, see the *OS documentation*.

- Settings for outputting crash dumps
  1. Select **Start** and then **Run**.
  2. Type `drwtsn32` in the text box, and click the **OK** button.
     The Dr. Watson for Windows dialog box appears.
  3. Select the **Create Crash Dump** File check box, and specify the output destination file in the **Crash Dump** text box.
  4. Click the **OK** button.

Important note

Not only JP1 information, but also error information of other application programs is output as crash dumps, with potential adverse effects on available disk space. If you set that crash dumps are to be output, make sure that you secure enough disk space for them.

(b) Setting method for Windows Server 2008

- Settings for outputting user mode process dumps
  You can use the following registry setting to obtain user mode process dumps of data you can use to investigate for troubleshooting when an application program has terminated:
  `\\HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\Windows Error Reporting \LocalDumps`
  Specify the following registry key values:
  - DumpFolder: `REG_EXPAND_SZ` *dump-output-folder-name*
    (Permission to write to the output destination folder is needed.)
  - DumpCount: `REG_DWORD` *Number-of-dumps-to-be-saved*
  - DumpType: `REG_DWORD 2`

Important note

- When you set the registry to output user mode process dumps, user mode process dumps are output for not only JP1 programs, but also other application programs. Make sure you keep this in mind when you set that user mode process dumps are to be output.
- When user mode process dumps are output, available disk space can be adversely affected. When user mode process dumps are set to be output, make sure that you specify a dump output folder that has enough disk space for the dumps.

(7) Cautionary notes

Note the following when installing and setting up Performance Management.

(a) Note on environmental variable

Because Performance Management uses `JPC_HOSTNAME` as an environment variable, do not set it as a user-specific environment variable, as this will prevent Performance Management from operating properly.

(b) Notes on installing and setting up multiple Performance Management programs on one host

With Performance Management, you can install PFM - Manager, PFM - Web Console, and PFM - RM for Microsoft SQL Server on the same host. When doing so, note the following:

- When PFM - Manager and PFM - RM for Microsoft SQL Server are installed on the same host, PFM - Base is not required. In this case, PFM - Manager is a prerequisite program for PFM - RM for Microsoft SQL Server and must be installed before PFM - RM for Microsoft SQL Server is installed.

- You cannot install PFM - Base and PFM - Manager on the same host. If you want to install PFM - Manager on a host on which PFM - Base and PFM - RM for Microsoft SQL Server are already installed, uninstall all Performance Management programs except PFM - Web Console, and then install PFM - Manager and PFM - RM for Microsoft SQL Server in this order. The same applies when you install PFM - Base on a host on which PFM - Manager and PFM - RM for Microsoft SQL Server are already installed: you must uninstall all Performance Management programs except PFM - Web Console, and then install PFM - Base and PFM - RM for Microsoft SQL Server in that order.
- If PFM - Manager already exists on the host where PFM - RM for Microsoft SQL Server is to be installed, the PFM - Manager on the local host becomes the connection-target PFM - Manager. In this case, you cannot change the connection target to the PFM - Manager on a remote host. To connect to a PFM - Manager on a remote host, PFM - Manager must not be already installed on your host.
- If you install PFM - Manager on a host on which PFM - RM for Microsoft SQL Server is already installed, the connection-target PFM - Manager is reset to the local host. Since the setting results are output to the common message log, check the log to verify the setting.
- Before installing PFM - RM for Microsoft SQL Server on a host on which PFM - Web Console has been installed, you must close all windows of Web browser.
- When you perform a new installation of a Performance Management program, the status management facility will be enabled by default. To change the setting of the status management facility, see the chapter on error detection for Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

Point:

To improve system performance and reliability, we recommend running PFM - Manager, PFM - Web Console, and PFM - RM for Microsoft SQL Server on separate hosts.

(c) Notes on upgrading PFM - RM for Microsoft SQL Server

Note the following when upgrading PFM - RM for Microsoft SQL Server.

For details about upgrading, see the Appendix in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

- Before installing Performance Management programs, make sure that no Performance Management programs and services are running on the local host, regardless of whether they are running on a physical or a logical host. For details about how to stop services, see the chapter on starting and stopping Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.
- If you install PFM - RM for Microsoft SQL Server on a host on which Performance Management programs are already installed, PFM - RM for Microsoft SQL Server will be installed in the same folder as the one containing the Performance Management programs other than PFM - Web Console. To change the installation folder, you must delete the Performance Management programs other than PFM - Web Console, and then re-install the deleted programs.
- You cannot install PFM - Base and PFM - Manager on the same host. If you want to install PFM - Manager on a host on which PFM - Base and PFM - RM for Microsoft SQL Server are already installed, uninstall all Performance Management programs except PFM - Web Console, and then install PFM - Manager and PFM - RM for Microsoft SQL Server in this order. The same applies when you install PFM - Base on a host on which PFM - Manager and PFM - RM for Microsoft SQL Server are already installed: you must uninstall all Performance Management programs other than PFM - Web Console, and then install PFM - Base and PFM - RM for Microsoft SQL Server in this order.
- When you upgrade, if the data model version of the Store database will change, the current Store database is automatically updated with the result that twice the disk space for the Store database is temporarily required. Before upgrading, make sure that there is enough free space on the disk where the Store database is stored. Estimate the necessary free space based on the total size of the current Store database. For example, if the total size of the current Store database is 100 gigabytes, at least 200 gigabytes of free space will be required for installation. If you change the disk where the Store database is stored, take into consideration the amount of disk space that will be needed on the disk after the switch.

(d) Other cautionary notes

- When you perform a new installation of PFM - RM in an environment in which no other Performance Management program has been installed, make sure that there are no files or folders in the installation folder.

- You might be prompted to restart the system if you attempt to install PFM - RM while another Performance Management program or service is running. Alternatively, you might be prompted to restart the system while Windows Event Viewer or another program that references Performance Management files is running. In either case, restart the system as indicated in the message, and complete the installation.
- The installer might be unable to expand the files required for installation if you attempt to install PFM - RM in the following cases: (1) while a Performance Management program or service is running or while another program that references Performance Management files (for example, Windows Event Viewer) is running, (2) when there is insufficient disk space, or (3) when you do not have the required folder permission. Stop any active Performance Management programs or services or other programs that reference Performance Management files, and then perform the installation again. If the problem is caused by insufficient disk space or a lack of the appropriate folder permissions, fix the problem and then perform the installation again.
- When installing the Performance Management program, check whether any of the following security-related programs are installed. If they are installed, perform the measures below:
  - Security monitoring programs

    Stop or change the settings for security monitoring programs so that installation of the Performance Management program is not prevented.
  - Virus detection programs

    We recommend that any virus detection programs be stopped before the Performance Management program is installed.

    If a virus detection program is running during installation of the Performance Management program, the installation speed might suffer, and installation might not be executed, might not be performed correctly.
  - Process monitoring software

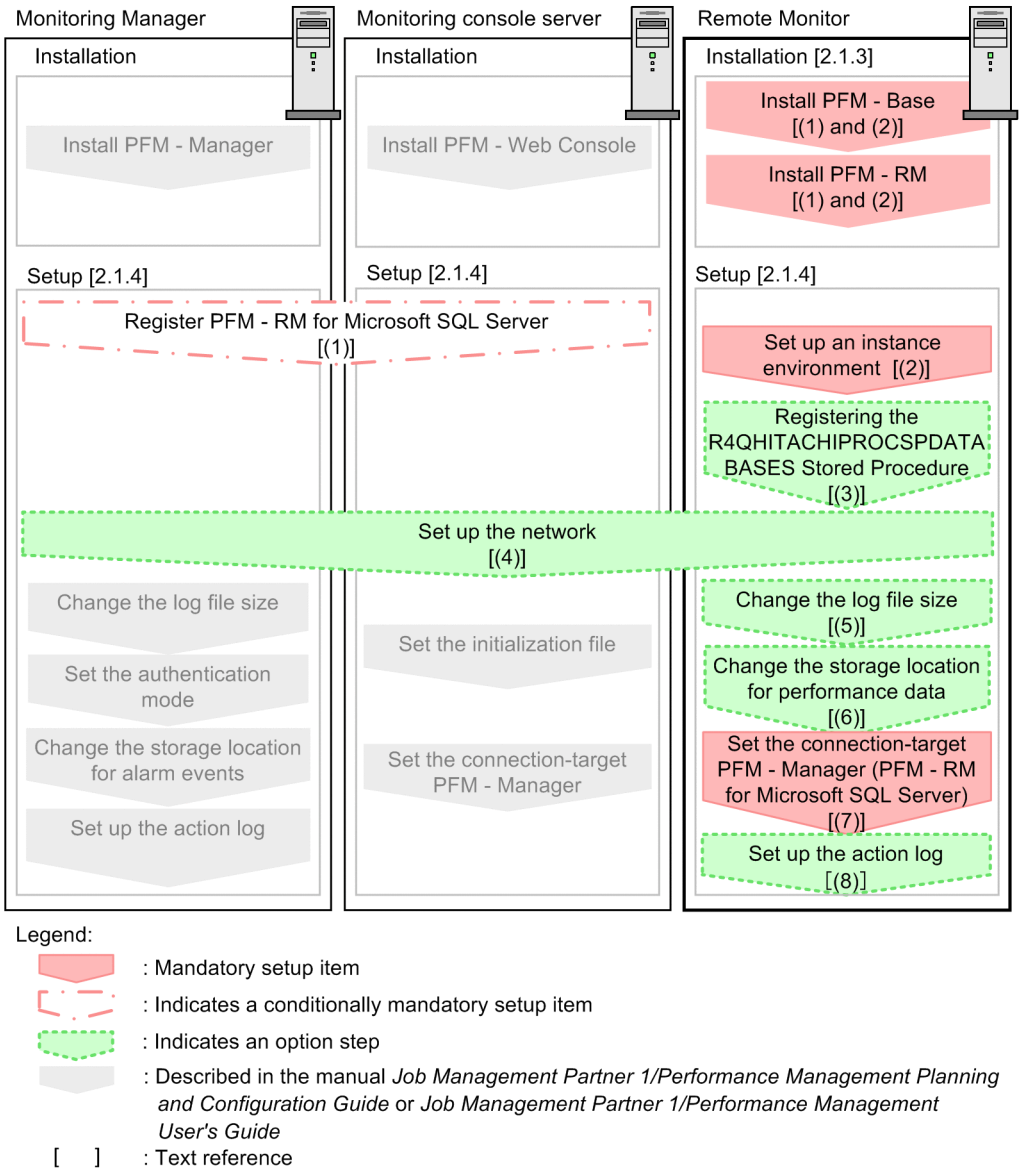
    Stop or change the settings for any process monitoring programs, so that monitoring is not performed for Performance Management services, and Common Component services.

    If a process monitoring program starts or stops these services during installation of the Performance Management program, installation might fail.

2.1.2 Installation and setup workflow

The following figure shows the workflow for installing and setting up PFM - RM for Microsoft SQL Server.

Figure 2-3: Installation and setup workflow



For details about the installation and setup procedures for PFM - Manager and PFM - Web Console, see the chapter on installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

Note that you can select whether to execute a setup command requiring user entry interactively or non-interactively.

If you execute a setup command interactively, you need to enter a value in accordance with command directives.

If you execute a setup command non-interactively, user entry is not required because the operator entry required during command execution can be replaced by the specification of options or definition file. Also, batch processing or remote execution can automate setup operations to reduce administrator workload and operating costs.

For details about commands, see the manual *Job Management Partner 1/Performance Management Reference*.

2.1.3 Installation procedure

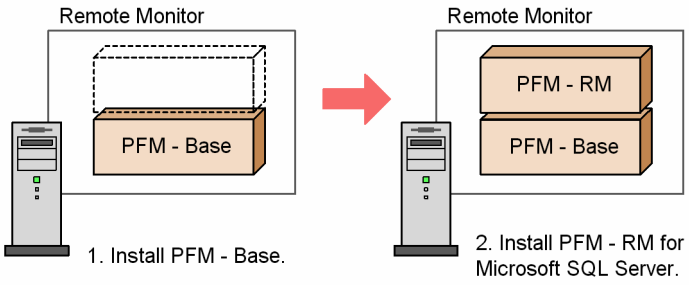
This subsection explains the order in which the component programs of PFM - RM for Microsoft SQL Server are to be installed, and describes how to install these programs from the supplied CD-ROM.

(1) Order of installation

Install PFM - Base, and then PFM - RM for Microsoft SQL Server. PFM - Base must be installed on the host before you install PFM - RM for Microsoft SQL Server.

If you want to install PFM - RM for Microsoft SQL Server and PFM - Manager on the same host, install PFM - Manager before you install PFM - RM for Microsoft SQL Server.

Multiple instances of PFM - RM for Microsoft SQL Server on the same host can be installed in any order.



(2) How to install the programs

You can install Performance Management programs on a Windows host either by using the supplied CD-ROM, or by using JP1/Software Distribution to perform a remote installation. For details about how to use JP1/Software Distribution, see the *Job Management Partner 1/Software Distribution Administrator's Guide Volume 1*, for Windows systems.

Precautions regarding a Windows

You must stop all active Performance Management programs and services on the host before beginning installation. For details about how to stop services, see the chapter on starting and stopping services in the *Job Management Partner 1/Performance Management User's Guide*.

Precautions regarding installation on a Windows Server 2008 environment

If user account control functionality (UAC) is enabled on the OS,
the User Account Control dialog box might be displayed during installation. If
this dialog box is displayed, click the Continue button to continue installation, or
click the Cancel button to cancel installation.

To install PFM - RM for Microsoft SQL Server:

1. On the host where PFM - RM for Microsoft SQL Server is to be installed, log on as a member of the Administrators group.
2. Stop all Performance Management programs and services.
   Stop any other Performance Management programs or services that are running.

   Notes on stopping services:

   The services you need to stop are the Performance Management services on the physical host and logical host. For details about how to stop services, see the chapter that describes how to start and stop Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.
3. Insert the provided medium in the CD-ROM drive.
   Proceed with installation by following the instructions of the installer that starts.
   You must define the following information during installation:

   - *User information*

     Enter user information, such as the user name.
   - *Installation destination folder*

     Specify the folder in which you want to install PFM - RM for Microsoft SQL Server.

     Note that a new folder is immediately created when a folder name is specified in the **Select Directory** dialog box and the **OK** button is clicked. If you have created an incorrect folder, delete it after installation.

- *Program folder*
  Specify the program menu name to be registered in Windows **Start** - **All Programs**.
  In the default mode, **Performance Management** is registered.

  Reference note

  The installation destination folder and program folder for all Performance Management programs, with the exception of PFM - Web Console, can be specified only when you first install a Performance Management program on that host. The next time you install a Performance Management program, the program will be installed and registered in the same folders.

2.1.4 Setting up PFM - RM for Microsoft SQL Server

This section explains the setup that is required before you can use PFM - RM for Microsoft SQL Server.

Option indicates an item that might be required depending on your operating environment, or an optional item that you can set if you do not wish to use the default.

(1) Registering PFM - RM for Microsoft SQL Server

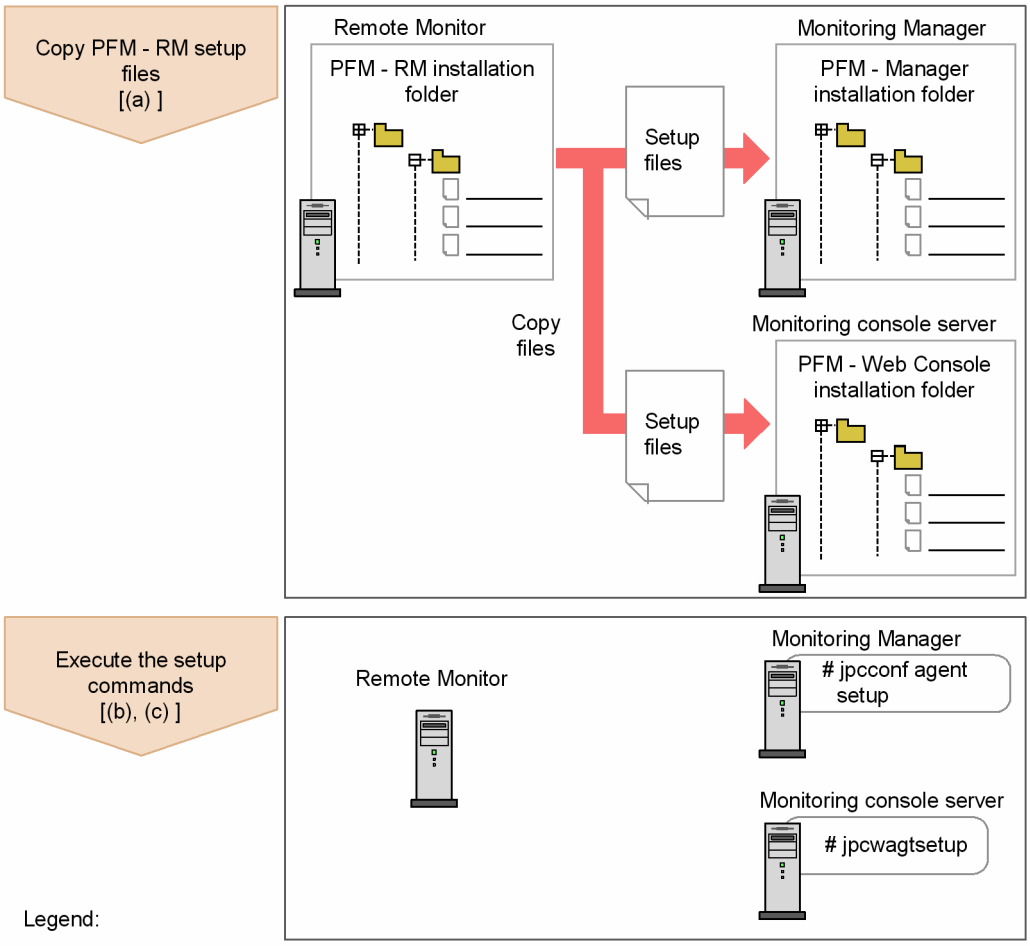
To perform integrated management of PFM - RM for Microsoft SQL Server by using PFM - Manager and PFM - Web Console, you must register PFM - RM for Microsoft SQL Server in PFM - Manager and PFM - Web Console. You will need to register PFM - RM for Microsoft SQL Server in the following cases:

- When you add a new instance of PFM - RM for Microsoft SQL Server to the Performance Management system.
  Note that you will not need to register PFM - RM for Microsoft SQL Server when you have already registered an instance of PFM - RM for Microsoft SQL Server and are going to add another instance of the same version PFM - RM for Microsoft SQL Server.
- When you update the data model version of an instance of PFM - RM for Microsoft SQL Server that is already registered.

For details about the data model version of an instance of PFM - RM for Microsoft SQL Server, see *H. Version Compatibility*.

The following figure shows the procedure for registering PFM - RM for Microsoft SQL Server.

Figure 2-4: Procedure for registering PFM - RM for Microsoft SQL Server



Important note

- Register PFM - RM for Microsoft SQL Server before setting up an instance environment.
- You do not need to register a new instance of an already registered version of PFM - RM for Microsoft SQL Server when you add it to the Performance Management system.
- When you have installed different versions of PFM - RM for Microsoft SQL Server on different hosts, set up the older version before the newer version.
- When you install PFM - RM for Microsoft SQL Server on the same host as PFM - Manager, the `jpcconf agent setup` command is executed automatically, and the following message is output to the common message log: KAVE05908-I `New agent setup (`*Pfm-Agent-service-key*`) ended successfully. (version=`*version*`)`. Check the result of command execution in the log file. If execution was unsuccessful, try it again. For details about how to execute commands, see the chapter on commands in the manual *Job Management Partner 1/Performance Management Reference*.
- In the Microsoft SQL Server memory settings, do not set the minimum query memory size to less than 1,024 KB (the initial value). If the minimum query memory size is smaller than 1,024 KB, queries for Microsoft SQL Server fail and no data can be collected.
- Registration of PFM - RM for Microsoft SQL Server creates the *RM SQLServer* folder in *Reports* window and *Alarms* window of PFM - Web Console. If the *RM SQLServer* file or folder already exists on the *Reports* window, rename the file or folder before registering PFM - RM for Microsoft SQL Server.

(a) Copy the PFM - RM for Microsoft SQL Server setup files

Copy the setup files from the host on which you installed PFM - RM for Microsoft SQL Server to the hosts on which PFM - Manager and PFM - Web Console are installed.

To copy the files:

1. If PFM - Web Console is running, stop it before copying the files.
2. Copy the PFM - RM for Microsoft SQL Server setup files, in binary mode.
   The following table shows the location of the setup files and where they should be copied.

Table 2-2: Setup files to be copied

PFM - RM for Microsoft SQL Server setup file	Destination		
	PFM program name	OS	Destination folder
installation-folder\setup\jpcagt4w.EXE	PFM - Manager	Windows	*installation-folder*\setup\
installation-folder\setup\jpcagt4u.Z		UNIX	/opt/jp1pc/setup/
installation-folder\setup\jpcagt4w.EXE	PFM - Web Console	Windows	*installation-folder*\setup\
installation-folder\setup\jpcagt4u.Z		UNIX	/opt/jp1pcwebcon/setup/

(b) Execute the setup command on the PFM - Manager host

On the PFM - Manager host, execute the following command to set up PFM - RM for Microsoft SQL Server:

```
jpcconf agent setup -key RMSQL
```

Although an example of interactive command execution is shown here, the `jpcconf agent setup` command can be also executed non-interactively. For details about the `jpcconf agent setup` command, see the chapter that describes commands in the manual *Job Management Partner 1/Performance Management Reference*.

! Important note

If any Performance Management programs or services are still running on the local host when you execute the `jpcconf agent setup` command, an error might occur. If an error occurs, make sure that all Performance Management programs and services have completely stopped, and then execute the `jpcconf agent setup` command again.

You can then delete the PFM - RM for Microsoft SQL Server setup files remaining on the PFM - Manager host.

(c) Execute the setup command on the PFM - Web Console host

On the PFM - Web Console host, execute the following command to set up PFM - RM for Microsoft SQL Server:

```
jpcwagtsetup
```

You can then delete the PFM - RM for Microsoft SQL Server setup files remaining on the PFM - Web Console host.

(2) Setting up an instance environment

PFM - RM for Microsoft SQL Server requires configurations of the instance environment and the monitoring target. There is a one-to-one match between the configuration of the instance environment and the configurations of the monitoring target.Note that in PFM - RM for Microsoft SQL Server you can associate one instance environment with only one monitoring target. You can set up multiple instance environments and monitoring targets by repeating the procedure for each instance.

- Setting up instance information
- Setting monitoring target

For example, if you monitor three instances of Microsoft SQL server, repeat these procedures three times.

When you create an environment where there are multiple instances, the number of instances depends on the system configuration. As a guide, use three to five instances for the number of instances. You can increase the number of instances by reducing the number of records to be collected or lengthening the collection interval. Consider this carefully before operation.

Notes on setting up an instance environment:

- You must change the following configurations of the Microsoft SQL Server instances in advance. For details about the setup method, see the Microsoft SQL Server documentation.
- Enable remote connections

  Use SQL Server Management Studio or so to enable remote connections.
- Enable TCP/IP or named pipe protocol

  Use SQL Server Configuration Manager or so to choose the protocol.

For details, see the Microsoft SQL Server documentations.

- Even if a value specified in the instance environment settings is invalid, the command for creating the instance environment terminates normally. However, if you start collecting records without changing the invalid setting value, no performance data is collected. For details about actions to take when no performance data is collected, see *7.2.5(3) Performance data is not collected after PFM - RM for Microsoft SQL Server startup*.

This section describes how to set up the instance environment and the monitoring target.

(a) Set up instance information

You must specify instance information for the Microsoft SQL Server that is to be monitored by the PFM - RM for Microsoft SQL Server. Specify instance information on the PFM - RM host.The following table lists the instance information items that are to be specified. You should check this information before you start the setup procedure.

Table 2-3: Instance information of PFM - RM for Microsoft SQL Server

Item	Description	Specifiable value	Default
LOG_PATH[#1]	Specifies the full path name of the folder for storing agent log information.	A character string of 245 or fewer bytes that does not include the following characters: • Tabs • The following symbols: / : , ; * ? " < > |	*installation-folder* \agt4\agent *instance-name*\log
LOG_SIZE	Specifies the maximum size of one agent log file. [#2]	1 to 32 (megabytes). The minimum recommended value is 16.	16

#1

If you want to change the output folder for agent logs from the default folder, make sure to choose a folder for which write permission is enabled.

For Windows Server 2008, you cannot delete or change any resource that is under a folder for which WRP resource protection is enabled. Therefore, do not specify the agent log output folder under a folder for which WRP is enabled.

#2

A maximum of 4 agent log files are collected for one instance. Before specifying the LOG_SIZE value, make sure that the value satisfies the following condition (this condition also applies when LOG_PATH is set to the default):

Amount of free space on the drive containing the folder specified in LOG_PATH (MB) > LOG_SIZE **x** 4

If the free disk space is insufficient, the agent log cannot be output. For details about the agent log, see *7.3 Log information*.

Note:

If no instance environment has been set up, the service of PFM - RM for Microsoft SQL Server does not start.

To build an instance environment using the `jpcconf inst setup` command:

1. Specify a service key and an instance name, and then execute the `jpcconf inst setup` command.

   Execute the command specified as follows:

   `jpcconf inst setup -key RMSQL -inst` *instance-name*

   Although an example of interactive command execution is shown here, the `jpcconf inst setup` command can be also executed non-interactively. For details about the `jpcconf inst setup` command, see the chapter that describes commands in the manual *Job Management Partner 1/Performance Management Reference*.

2. Set up the instance information for PFM - RM for Microsoft SQL Server.
   Enter the values for the items listed in Table 2-3 as prompted by the command. All items are mandatory. To use the default value displayed for an item, only press the **Enter** key.

When all values have been entered, the instance environment is created. If you want to change the agent log output destination or the agent log file size, re-execute the `jpcconf inst setup` command to update the instance environment. For details about updating an instance environment, see *2.4.3 Updating an instance environment*.

The instance environment that is built is described as follows:

- The organization of the instance environment folder
  The following table lists and describes the folder configuration of the instance environment that is built.

Table 2-4: Folder configuration of the instance environment

Installation folder	File name	Descriptions
Installation-folder[#1]`\agt4\agent\`*instance-name*	`jpcagt.ini`	Remote Monitor Collector service startup initialization file
	`jpcagt.ini.model`[#]	Model file for the Remote Monitor Collector service startup initialization file
	`status.dat`	Relay file for internal processing
	`tstatuses.dat`	Status information file for virtual agent
	`targetlist.ini`	List file for monitoring target
	`grouplist.ini`	List file for monitoring group
	`GARULES.DAT`	List file of gathering rule descriptions
	`targets`	Storage folder for remote agent
	`groups`	Storage folder for group agent
	`log`	Storage folder for log files
Installation-folder[#1]`\agt4\store\`*instance-name*	`jpcsto.ini`	Remote Monitor Store service startup initialization file
	`jpcsto.ini.model`[#2]	Model file for the Remote Monitor Store service startup initialization file
	`*.DB`	Performance data file
	`*.IDX`	Index file for performance data file
	`*.LCK`	Lock file for performance data file
	`status.dat`	Relay file for internal processing
	`*.DAT`	Data model definition file
	`dump`	Export destination folder
	`import`	Standard database import destination folder
	`backup`	Backup destination folder
	`log`	Storage folder for log files
	`partial`	Standard database partial backup destination folder

#1

For the default storage location when PFM - RM for Microsoft SQL Server runs on a logical host, replace *installation-folder* with *environment-folder*`\jp1pc`.

#2

This file is used to reset all values to the initial values set when the instance environment was created.

- Service ID for the instance environment
  The service ID for the instance environment is shown as follows.
  - Remote Monitor Collector service:
    `4A`*instance-number instance-name*`[`*host-name*`]`
  - Remote Monitor Store service:
    `4S`*instance-number instance-name*`[`*host-name*`]`
  - Group Agent service:
    `4A`*instance-number instance-name*`[All@`*host-name*`]`

  In PFM - RM for Microsoft SQL Server, the *instance name* specified in the `jpcconf inst setup` command is displayed. For example, if you execute the command with *host name* host1 and *instance name* default, the service IDs will be as follows:
  - Remote Monitor Collector service:
    `4A1 default[host1]`
  - Remote Monitor Store service:
    `4S1 default[host1]`
  - Group Agent service:
    `4A1 default[All@host1]`

  For details about the service ID, see the naming rules described in Appendix in the *Job Management Partner 1/ Performance Management Planning and Configuration Guide*.
- Windows service name for the instance environment
  The Windows service name for the instance environment is described as follows:
  - Remote Monitor Collector service:
    PFM - RM for Microsoft(R) SQL Server *instance-name*[*logical-host-name*]
  - Remote Monitor Store Service:
    PFM - RM Store for Microsoft(R) SQL Server *instance-name*`[`*logical-host-name*`]`

  For example, when the *logical host name* is lhost and the *instance name* is default, the service name will be:
  - Remote Monitor Collector service:
    PFM - RM for Microsoft(R) SQL Server `default[lhost]`
  - Remote Monitor Store Service:
    PFM - RM Store for Microsoft(R) SQL Server default`[lhost]`

  For details about Windows service names, see the naming rules described in the Appendix in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.
  For details about the Windows service names for logical host operation, in the *Job Management Partner 1/ Performance Management User's Guide*, see the chapters explaining setup and operation for cluster systems.

(b) Set the monitoring target

When you set the monitoring target, you associate the instance that you specify in *(a) Set up instance information* with the information about the monitoring target host. You associate the instance with the monitoring target on the PFM - RM host

You must specify the information shown in the following table. Before you set the monitoring target, check the information in advance.

Table 2-5: Configuration for the monitoring target of PFM - RM for Microsoft SQL Server

Item	Description	Specifiable value	Default value
`TARGET_HOST`	Microsoft SQL Server host name for a monitoring target. If the Microsoft SQL Server host is a logical host, specify the logical host.	Host names can consist of 1 to 32 alphanumeric characters and hyphen. Note that you cannot specify a (logical) host name beginning with a hyphen. Physical and logical host names must be unique within the system. #1	--

Item	Description	Specifiable value	Default value
SQL_INSTANCE	Instance name for monitoring target.	Specifiable value varies depending on how you install Microsoft SQL Server: If you install Microsoft SQL Server by default: [default] If you install Microsoft SQL Server and specify the instance name: [*the instance name you specified*]	default
SQL_USER#2	Specifies the user name of Microsoft SQL Server used for Microsoft SQL Server authentication.	The user account that has permissions equivalent to sa (the account of a member who has the sysadmin fixed server role). If you specify other user name, see *(d) Login permissions of the Microsoft SQL Server*.	sa
SQL_PASSWORD#2	Specifies the password of the Microsoft SQL Server user used for Microsoft SQL Server authentication.	The password for SQL_USER.	--
TIMEOUT	Specifies the query timeout value for database access. The value is in seconds.	1 to 3,600 (seconds)	60
LOGIN_TIMEOUT	Specifies the access timeout value for database access. The value is in seconds.	1 to 3,600 (seconds)	20
DB_FREE_PERC_OPTION#3,#4	Specify how to display the value of Free % field in the PD_DS record when its value is negative.	{Y | N} If Y is specified, the value of DB_FREE_PERC_NUMBER is displayed as the value of Free % field when its value is negative. If N is specified, the value of Free % field is displayed as it is when its value is negative.	Y
DB_FREE_PERC_NUMBER#4,#5	Specify the value to replace the value of Free % in the PD_DS record when its value is negative. The replacement is enabled only when the value of DB_FREE_PERC_OPTION is Y.	-1 to 999	0
LIMIT_PD_LD_NUMBER#6	Specify the maximum number of collection records for the PD_LD record.	0 to 900,000 If you specify 0, no upper limit is set, and all data is collected.	0

Legend:

--: None

#1:

You cannot specify "ALL" because "ALL" is a reserved word for group agent.

#2:

Authentication method varies according to the value of SQL_USER you specified. The following table shows the variation on the authentication method.For details about how to install Microsoft SQL Server, instance information, and user authentication, see the Microsoft SQL Server documentation.

Table 2-6: Authentication methods for each user name specified in SQL_USER field

The value of SQL_USER	The value of SQL_PASSWORD	Authentication method
sa	The password for the user sa.	SQL Server Authentication
	None (when no password is set).	
Any alphabetic string	Password for the specified user.	
	Blank (when no password is set).	
A space character	Unnecessary (ignored if specified).	Windows Authentication

Note that when the method is Windows Authentication, PFM - RM for Microsoft SQL Server uses its service account to obtain authentication.

When you use Windows Authentication to monitor Microsoft(R) SQL Server 2012, the server role `sysadmin` is not added to the local system account. Accordingly, add `sysadmin` or prepare another account.

#3:

If you want to change the output folder for agent logs from the default folder, make sure to choose a folder for which write permission is enabled. For Windows Server 2008, you cannot delete or change any resource that is under a folder for which WRP resource protection is enabled. Therefore, do not specify the agent log output folder under a folder for which WRP is enabled.

#4:

If the value of Free % field is replaced when its value is negative, "KAVL19847-I" message is output to the agent log.

#5:

If you set the Free % field as a measured parameter of the alarm condition, specify the value depending on the operation environment.

If you want to give the alarm:

-The value you specify in this field must be above the threshold of the abnormal and warning condition.

If you do not want to give the alarm:

-The value you specify in the field must be below the threshold of the abnormal and warning condition.

#6:

If you collect the Lock Details (`PD_LD`) record when a large number of transactions or access locks have occurred in the Microsoft SQL Server, the following events might occur.

- The space in the Store database increases.
- Collection takes time, and until the collection has been completed, the collection of other records is skipped.
- A large amount of memory is consumed.

For example, if the number of locks temporarily increases during backup of the Microsoft SQL Server databases, you can set an upper limit for the Lock Detail (`PD_LD`) record to reduce system load.

The setting value must be greater than the maximum number of locks occurring during normal operation. You can check the number of locks by using either of the following methods:

- Check the normal log in the agent logs.

The number of locks is provided by the following message:

`KAVL19807-I Getting record ended = LD -> Storing started [ count =` *number-of-records* `]`

- Execute an SQL statement to check the current number of locks.

You can check the number of locks by executing the SQL statement described in the PD_LD row in Table A-1 in *A.4 Calculating the number of instances for records*.

Notes:

- Even if you set the invalid value(s) to each item listed in the Table 2-5, `jpcconf target setup` command terminates successfully. Yet, even after PFM - RM for Microsoft SQL Server starts collecting the records, PFM - RM for Microsoft SQL Server does not collect the performance data. For details about actions to take when no performance data is collected, see *7.2.5(3) Performance data is not collected after PFM - RM for Microsoft SQL Server startup*.
- Do not use the multiple PFM - RM for Microsoft SQL Server to monitor the same Microsoft SQL Server instance.
- Do not use PFM - RM for Microsoft SQL Server and PFM - Agent Option for Microsoft SQL Server to monitor the same instance of the Microsoft SQL Server.

- If you are running a firewall environment on the host of the monitoring target Microsoft SQL Server instance, set up the firewall environment so that the PFM - RM for Microsoft SQL Server can successfully connect to the Microsoft SQL Server host. For details, see your Microsoft SQL Server documentation.

In order to set up the monitoring target environment, execute the `jpcconf target setup` command. To set up the monitoring target environment:

Although an example of interactive command execution is shown here, the `jpcconf target setup` command can be also executed non-interactively. For details about the `jpcconf target setup` command, see the chapter that describes commands in the manual *Job Management Partner 1/Performance Management Reference*.

1. Execute the `jpcconf target setup` command specified with the service key, the instance name, and the monitoring target.

   The `jpcconf target setup command` is executed in the following format:

   `jpcconf target setup -key RMSQL -inst` *`instance-name`* `-target` *`monitoring-target-name`*
2. Specify the monitoring target information of PFM - RM for Microsoft SQL ServerEnter the information shown in the Table 2-5 in accordance with the command's instructions. You must enter all of the information items. To use the displayed default value, press the **Enter** key.

After you have finished entering the information, the monitoring target environment is set up. If you want to change the monitoring target information, re-execute the `jpcconf target setup` command and update the monitoring target environment. For details about updating the monitoring target environment, see *2.4.2 Updating a monitoring target*.You can change some of the specified information by editing properties in PFM - Web Console. For details, see *E.3 List of remote agent and group agent properties*.

The monitoring target environment that is built up is described below:

- The organization of the monitoring target environment folder

  After you have entered all items, the monitoring target environment is created. The following table shows the organization of the folders for the created monitoring target environment.

  Table 2–7: Organization of the monitoring target environment folder

Installation folder	file name	Description
Installation-folder# `\agt4\agent\`*instance-name*`\targets`	*Monitoring-target-name*`.ini`	Configuration file for the monitoring target
	Monitoring-target-name`.ini.model`	Model configuration file for the monitoring target

  #

  For the default storage location when PFM - RM for Microsoft SQL Server runs on a logical host, replace *installation-folder* with *environment-folder*`\jp1pc`.

The service ID added by setting the monitoring target is as follows:

- Service ID to be added
  - Remote Agent service

    `4A` *instance-number* *instance-name*`[`*monitoring-target-name*`@`*host-name*`]`

    The instance name and monitoring target name are the values that are specified in the `jpcconf target setup` command. When `host1` is specified as the host name of the PFM - RM host, `inst1` is specified as the instance name, and `targethost1` is specified as the monitoring target name, the service ID is set as follows:

    `4A1inst1[targethost1@host1]`

    For details about service IDs, see the naming rules described in the appendix in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

(c) Using Windows authentication

When the instance environment is built up, the login account for the PFM - RM for Microsoft SQL Server service is created as the local system account. If you choose to use the Windows authentication when you set the monitoring target, you need to change the login account for the PFM - RM for Microsoft SQL Server service to the account that is

accessible to the monitoring target host and can log in to the host as the service. To check whether the account you specify can log in as the service to the monitoring target host, use Microsoft SQL Server `Management Studio` or `sqlcmd` command. For details, see your Microsoft SQL Server documentation.

To change the account:

- From the Windows **Start** menu, choose **Administrative Tools** and then **Service**.
- In the Detail pane, right-click the PFM - RM for Microsoft(R) SQL Server *instance-name* **Service** window and then click **Properties**.
- Click the **Log On** tab, specify the **Account**, and type the password.

For details, see the documentation for your OS.

Note:

Do not change the account of PFM - RM Store for Microsoft(R) SQL Server *instance-name* service.

(d) Login permissions of the Microsoft SQL Server

To operate the Microsoft SQL Server, you need a Microsoft SQL Server login (database user) with certain permissions.For PFM - RM for Microsoft SQL Server to collect the performance information of the Microsoft SQL Server Database, the select permission on the sysfiles system tables of each database is required.You must grant the proper permissions in accordance with the records you collect by using PFM - RM for Microsoft SQL Server and operate PFM - RM for Microsoft SQL Server. The table 2-8 shows the required permissions for collecting each record of PFM - RM for Microsoft SQL Server.

Table 2-8: The required permissions for each record of PFM - RM for Microsoft SQL Server

Records	The required permissions
• `Server Detail (PD)` • `Database Detail (PD_DD)` • `Database Space Detail (PD_DS)` • `Server Space Detail (PD_SS)` • `Server Space Interval (PI_SI)` • `Config Detail (PD_CD)` • `Lock Detail (PD_LD)` • `Server Locks Detail (PD_LOCK)` • `Process Detail (PD_PDET)` • `Global Server Summary (PI)` • `Server Overview (PI_SERV)` • `Transaction Log Overview (PI_TLOG)` • `Global Server Summary 2(PI_PI2)` • `Server Overview 2(PI_SRV2)`	The required permissions varies depending on the objects you use when collecting records (for details, see the *table 2-9*).

The below table shows the required permissions for each object which PFM - RM for Microsoft SQL Server uses when collecting records.

Table 2-9: The required permissions for each object which PFM - RM for Microsoft SQL Server uses when collecting records

Records	Objects	Required permissions when collecting records
PD_CD	sp_configure	Grant the EXEC permissions for the sp_configure to the database users for the master database mapped to the login.
PD, PI, PI_PI2	The scalar functions whose name begins with "@@".	None (all the users can execute the objects by default)

Records	Objects	Required permissions when collecting records
PD, PD_DD, PD_DS, PD_SS, PI_SI	master..sysdatabases	Grant the SELECT permissions for the sysdatabases to the database users for the master database mapped to the login.
	sp_databases	Grant the EXEC permissions for the sp_databases to the database users for the master database mapped to the login. Note that you do not need to grant the permission when you execute the sp_inst.sql script.
	R4QHITACHIPROCSPDATABASES	Grant the EXEC permissions for the `R4QHITACHIPROCSPDATABASES` to the database users for the master database mapped to the login. Note that you need to grant the permission only when you execute the sp_inst.sql script.
	master.dbo.spt_values	Grant the SELECT permissions for the spt_values to the database users for the master database mapped to the login.
	*..sysindexes	Grant the SELECT permissions for the sysindexes to the database users for all the databases mapped to the login.
	*.sys.indexes	Grant the SELECT permission for the sys.indexes to the database users (including the users in the mirroring configuration if you monitor the mirrored databases) for all the databases mapped to the login.
	DBCC SQLPERF(LOGSPACE)	VIEW SERVER STATE permission is a prerequisite for all the database users to execute the object.
	msdb.dbo.backupset	Grant the SELECT permission for the backupset to the database users for the msdb database mapped to the login.
	*..sysarticles	Grant the SELECT permission for the sysarticles to the database users for all the databases mapped to the login.
	*..syspublications	Grant the SELECT permission for the syspublications to the database users for all the databases mapped to the login.
	*..syssubscriptions	Grant the SELECT permission for the syssubscriptions to the database users for all the databases mapped to the login.
PD, PD_DD, PD_LD, PD_LOCK	master..sysprocesses	Grant the SELECT permission for the sysprocesses and the VIEW SERVER STATE permission for the Microsoft SQL Server host to the database users for the master database mapped to the login.
	master..syslogins	Grant the SELECT permission for the syslogins to the database users for the master database mapped to the login.
	master..sysusers	Grant the SELECT permission for the sysusers to the database users for the master database mapped to the login.
PD, PD_DD, PD_LD, PD_LOCK, PD_PDET	master..syslockinfo	Grant the SELECT permission for the syslockinfo and the VIEW SERVER STATE permission for the Microsoft SQL Server to the database users for the master database mapped to the login.
	*..sysobjects	Grant the SELECT permission for the sysobjects to the database users for all the databases mapped to the login.
PD, PI, PI_SERV, PI_PI2, PI_SRV2	master..sysperfinfo	Grant the SELECT permission for the sysperfinfo to the database users for the master database mapped to the login.
PD_DD, PD_DS, PD_SS, PI_SI	*..sysfiles	Grant the SELECT permission for the sysfiles to the database users for all the databases mapped to the login.
PD_DS, PD_SS, PI_SI	*.sys.allocation_units	Grant the SELECT permission for the sys.allocation_units to the database users (including the users in the mirroring configuration if you monitor the mirrored databases) for all the databases mapped to the login.

Records	Objects	Required permissions when collecting records
PD_DS, PD_SS, PI_SI	*.sys.partitions	Grant the SELECT permission for the sys.partitions to the database users (including the users in the mirroring configuration if you monitor the mirrored databases) for all the databases mapped to the login.
	*.sys.internal_tables	Grant the SELECT permission for the sys.internal_tables to the database users (including the users in the mirroring configuration if you monitor the mirrored databases) for all the databases mapped to the login.
PD, PI, PI_SERV, PI_PI2, PI_SRV2	DBCC SQLPERF(IOSTATS)	None (all the users can execute the objects).
	DBCC SQLPERF(LRUSTATS)	
	DBCC SQLPERF(NETSTATS)	
	DBCC SQLPERF(RASTATS)	
PI_TLOG	DBCC SQLPERF(LOGSPACE)	VIEW SERVER STATE permission is a prerequisite for all the database users to execute the object.
PD_LD	master.sys.dm_tran.locks	Grant the SELECT permission for the sys.dm_tran_locks and the VIEW SERVER STATE permission for the Microsoft SQL Server to the database users for the master database mapped to the login.
	*.sys.all_objects	Grant the SELECT permission for the sys.all_objects to the database users for all the databases mapped to the login.

(3) Registering the R4QHITACHIPROCSPDATABASES Stored Procedure Option

If the size of a database in an instance is 2 terabyte or larger, PFM - RM for Microsoft SQL Server can acquire information only when this stored procedure has been Registered.Register the stored procedure on the monitoring target Microsoft SQL Server host.If you install Microsoft SQL Server on the PFM - RM host, use `osql` utility or `sqlcmd` utility to register the stored procedure to the Microsoft SQL Server.

- `R4QHITACHIPROCSPDATABASES`

  PFM - RM for Microsoft SQL Server uses this stored procedure to acquire a list of database names and sizes from Microsoft SQL Server.

Note:

The `R4QHITACHIPROCSPDATABASES` stored procedure cannot be registered if a stored procedure table view that has the same name already exists in the `master` database of the monitored Microsoft SQL Server instance.

The `R4QHITACHIPROCSPDATABASES` stored procedure can be registered by using the `sp_rist.sql` script provided by PFM - RM for Microsoft SQL Server. To use the `splcmd` utility to register the stored procedure:

1. Set up an environment in which the `splcmd` utility of Microsoft SQL Server can be executed.

   The `splcmd` utility is provided by Microsoft. For details about the environment settings for Microsoft SQL Server, see your Microsoft SQL Server documentation.
2. Move to the folder in which the `sp_rist.sql` script is located.

   The script is located in the following folder:

   installation-folder`\agt4\sql`
3. Execute the script with the monitored Microsoft SQL Server instance specified.

   The command line for executing the `sp_rist.sql` script depends on the type of the monitored Microsoft SQL Server instance and the method of authentication used for connecting to Microsoft SQL Server. The following shows the command line for each condition.

   - *When the default instance of Microsoft SQL Server is being monitored*

Authentication method	Command line for executing the `sp_inst.sql` script
SQL Server	`splcmd -S` *host-name* `-U` *user-name* `-P password -d master -i sp_rist.sql` #
Windows	`splcmd -S` *host-name* `-E -d master -i sp_rist.sql` #

- *When a named instance of Microsoft SQL Server is being monitored*

Authentication method	Command line for executing the sp_inst.sql script
SQL Server	`splcmd -S` *host-name*`\`*instance-name* `-U` *user-name* `-P` *password* `-d master -i sp_rist.sql` #
Windows	`splcmd -S` *host-name*`\`*instance-name* `-E -d master -i sp_rist.sql` #

#

The following describes the items that the user specifies:

host-name: Name of the host on which the monitored Microsoft SQL Server instance operates

instance-name: Name of the monitored Microsoft SQL Server instance

user-name: `sa` or a user account that has permissions equivalent to `sa` (the account of a member who has the `sysadmin` fixed server role)

password: Password for the specified user name

For details about how to delete the `R4QHITACHIPROCSPDATABASES` Stored Procedure, see *I. Deleting the R4QHITACHIPROCSPDATABASES Stored Procedure*.

(4) Specifying network settings Option

You must specify the network settings according to the configuration in which Performance Management will be used.

You can specify the following two network settings:

- *IP addresses*

  Set the IP addresses when using Performance Management in a network environment in which multiple LANs are connected. You can set multiple IP addresses by defining the host names and IP addresses in the `jpchosts` file. Use the same `jpchosts` file throughout the Performance Management system.

  For details, see the chapter on installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

- *Port numbers*

  Specify the port numbers to be used by Performance Management. To avoid conflicts, use the same port numbers and service names throughout the Performance Management system.

  For details about setting port numbers, see the chapter on installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

(5) Changing the size of log files Option

Performance Management outputs its operating status to a set of proprietary log files called the *common message log*. By default, the common message log consists of two 2,048 KB files. Setting is required only if you want to change the default file size.

For details, see the chapter on installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

(6) Changing the storage location of performance data Option

Setting is required only if you want to change the folders used for saving, backing up, exporting, or importing the database of performance data managed by PFM - RM for Microsoft SQL Server.

By default, performance data is saved in the following locations:

- Save folder: *installation-folder*\agt4\store*instance-name*\
- Backup folder: *installation-folder*\agt4\store*instance-name*\backup\
- Partial backup folder: *installation-folder*\agt4\store*instance-name*\partial\
- Export folder: *installation-folder*\agt4\store*instance-name*\dump\
- Import folder: *installation-folder*\agt4\store*instance-name*\import\

Note:

For the default save destination for logical host operation, replace *installation-folder* with *environment-folder* \jp1pc\.

For details, see *2.4.1 Changing the storage location of performance data*.

(7) Setting the connection-target PFM - Manager of PFM - RM for Microsoft SQL Server

On the host where PFM - RM for Microsoft SQL Server is installed, you must specify the PFM - Manager that manages that PFM - RM for Microsoft SQL Server.

Use the jpcconf mgrhost define *command* to set the connection-target PFM - Manager.

! Important note

- When multiple instances of PFM - RM are installed on a single host, you can specify only one PFM - Manager as their connection target. You cannot have different instances of PFM - Manager as the connection target for the PFM - RM instances.
- If PFM - RM for Microsoft SQL Server and PFM - Manager are installed on the same host, the PFM - Manager on the local host is the connection-target PFM - Manager. You cannot use PFM - Manager on another host as the connection target.
- Stop all active Performance Management programs and services on the local host before beginning setup. For details about how to stop services, see the chapter on starting and stopping Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

To specify the connection-target PFM - Manager:

1. Stop all Performance Management programs and services.

   If any Performance Management programs or services are running when you execute the jpcconf mgrhost define command, you will be prompted by a message to stop the programs or services.

2. Execute the jpcconf mgrhost define command with the host name of the connection-target PFM - Manager host specified.

   For example, if the connection-target PFM - Manager is on host host01, specify the following:

   ```
   jpcconf mgrhost define -host host01
   ```

   Although an example of interactive command execution is shown here, the jpcconf mgrhost define command can be also executed non-interactively. For details about the jpcconf mgrhost define command, see the chapter that describes commands in the manual *Job Management Partner 1/Performance Management Reference*.

(8) Outputting the action logs Option

You need to perform this setting if you want to output action logs when PFM - RM for Microsoft SQL Server gives alarms. Action logs are the historical information output with the alarms exceeding threshold values (such as the alarms concerning system load).

For details about how to set up, see *J. Outputting Action Log Information*.

2.2 Setup cancellation and uninstallation

This section describes the procedures for uninstalling or canceling setup of PFM - RM for Microsoft SQL Server.

2.2.1 Cautionary notes on setup cancellation and uninstallation

Note the following when uninstalling or canceling setup of PFM - RM for Microsoft SQL Server.

(1) Note on OS user permission required to uninstall PFM - RM

Before you uninstall PFM - RM for Microsoft SQL Server, make sure that you have logged on a member of the Administrators group.

(2) Note on network configuration

When you uninstall a Performance Management program, the port numbers defined in the `services` file will remain in the file.

(3) Notes on programs

- If you uninstall a Performance Management program while another Performance Management program or service or other program that references Performance Management files (for example, Windows Event Viewer) is running, some files or folders might remain in the system. If files remain, manually delete everything under the installation folder.
- If you uninstall a Performance Management program while another Performance Management program or service or other program that references Performance Management files (for example, Windows Event Viewer) is running, you might be prompted to restart the system. If this happens, restart the system to complete the uninstallation process.
- If both PFM - Base and PFM - RM for Microsoft SQL Server are installed on a host, you cannot uninstall PFM - Base without first uninstalling PFM - RM for Microsoft SQL Server. In this case, uninstall PFM - RM for Microsoft SQL Server and then PFM - Base in that order. The same applies when both PFM - Manager and PFM - RM for Microsoft SQL Server are installed on a host. You cannot uninstall PFM - Manager without first uninstalling PFM - RM for Microsoft SQL Server. In this case, uninstall PFM - RM for Microsoft SQL Server and then PFM - Manager in that order.

(4) Notes on services

- Before uninstalling PFM - Manager, stop all active Performance Management programs and services throughout the entire system.
- Uninstalling PFM - RM for Microsoft SQL Server does not delete the information about the service from the list that appears when you execute the `jpctool service list` command. For details about deleting the information about the service, see the section about deleting the service in the chapter on installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*. When you want to update the PFM - Web Console host to reflect the deletion of service information, you need to execute the `jpctool service sync` command to synchronize the agent information of the PFM - Manager host and that of the PFM - Web Console host.
- If you uninstall PFM - Manager and then re-install it on the same machine, the Trap Generator service might appear twice when you execute the `jpctool service list` command. In this case, start the PFM - Manager service and use the `jpctool service delete` command to delete the Trap Generator service listed as Inactive.

(5) Other notes

- Before uninstalling a program of the Performance Management products from a host on which PFM - Web Console has been installed, you must close all windows of Web browser.

- Before you start uninstallation, use the `jpcconf inst setup` command or PFM - Web Console to check the agent log output directory. If this directory has been changed from the default directory (*installation-folder* `\agt4\agent\`*instance-name*`\log\`), the agent log files remain after uninstallation. Manually delete these files after uninstallation.

2.2.2 Procedure for canceling setup

This subsection describes how to cancel setup of PFM - RM for Microsoft SQL Server.

(1) Canceling setup of an instance environment

Canceling setup of an instance environment involves the tasks listed below. To cancel setup of multiple instance environments, you must repeat the procedure for each environment.

- Deleting a monitoring target
- Deleting an instance environment
- Deleting the registered stored procedure

To cancel the setup of an instance environment:

(a) Deleting a monitoring target

Check a monitoring target name before deleting the monitoring target. Delete the monitoring target on the PFM - RM host.

Use the `jpcconf target list` command to check the monitoring target name. Use the `jpcconf target unsetup` command to delete the monitoring target.

The following procedure describes how to delete a monitoring target.

1. Check the monitoring target name.

   Execute the `jpcconf target list` command specified with the service key and the instance name that indicate the PFM - RM for Microsoft SQL Server whose monitoring target name you are going to delete.

   ```
   jpcconf target list -key RMSQL -inst instance-name
   ```

   The monitoring target name is displayed:

   ```
   Targets:
   targethost1
   targethost2
   Groups:
   All
   ```

2. Stop all the PFM - RM for Microsoft SQL services.

   For details about how to start and stop the service, see the chapter on starting and stopping Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

3. Delete the monitoring target.

Execute the `jpcconf target unsetup` command specified with the service key, the instance name, and the monitoring target name that indicate PFM - RM for Microsoft SQL Server whose monitoring target you are going to delete.

```
jpcconf target unsetup -key RMSQL -inst instancename -target
monitoringtargetname
```

If the `jpcconf target unsetup` command terminates successfully, the Microsoft SQL Server host specified by the monitoring target is no longer monitored.

Notes:

- Canceling setup of an instance environment does not delete the service information that is displayed with the `jpctool service list` command.

When you want to update the PFM - Web Console host to reflect the deletion of monitoring target, you need to execute the `jpctool service sync` command to synchronize the agent information of the PFM - Manager host and that of the PFM - Web Console host.

- Use the `jpcconf target unsetup` command to delete the monitoring target while PFM - RM for Microsoft SQL Server stops.
- If you delete the monitoring target while PFM - RM for Microsoft SQL Server is still running, the service of PFM - RM for Microsoft SQL Server deletes the monitoring target, then the following message is output to the agent log, and PFM - RM for Microsoft SQL Server stops: "KAVL19848-E ".

For the details about the commands, see the chapter on the commands in the manual *Job Management Partner 1/ Performance Management Reference*.

(b) Delete an instance environment

Check the instance name and delete the instance environment. Delete an instance environment on the PFM - RM host.

To check the instance name, use the `jpcconf inst list` command. To delete an instance environment that has been created, use the `jpcconf inst unsetup` command.

To delete an instance environment:

1. Check the instance name.

   Execute the `jpcconf inst list` command specified with the service key that indicates PFM - RM for Microsoft SQL Server.

   ```
   jpcconf inst list -key RMSQL
   ```

   For example, if the instance name is SQL1, the command displays SQL1.

2. Stop all active PFM - RM for Microsoft SQL Server services in the instance environment.

   For details about how to stop services, see the chapter on starting and stopping Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

3. Delete the instance environment.

   Execute the `jpcconf inst unsetup` command specified with the service key that indicates PFM - RM for Microsoft SQL Server and the instance name.

   For example, if the instance name is SQL1, use the following command line:

   ```
   jpcconf inst unsetup -key RMSQL -inst SQL1
   ```

   Although an example of interactive command execution is shown here, the `jpcconf inst unsetup` command can be also executed non-interactively. For details about the `jpcconf inst unsetup` command, see the chapter that describes commands in the manual *Job Management Partner 1/Performance Management Reference*.

   When the `jpcconf inst unsetup` command terminates successfully, the folders created as the instance environment are deleted, as well as the service IDs and Windows services.

Note:

Canceling setup of an instance environment does not delete the service information that is displayed with the `jpctool service list` command. Use the `jpctool service delete` command to delete service information, and then restart PFM - Manager.

If you want to update the PFM - Web Console host to reflect the deletion of instance environment, you need to execute the `jpctool service sync` command to synchronize the agent information of the PFM - Manager host and that of the PFM - Web Console host.

The following shows sample conditions and a command line applicable for the conditions.

- Instance name: SQL1
- Host name: host1
- Service ID of the Remote Monitor Collector service: `4A1SQL`[host1]
- Service ID of the Remote Monitor Store service: `4S1SQL`[host1]

```
jpctool service delete 4?1SQL1[host1] -host host1
```

For details about the command, see the chapter on commands in the manual *Job Management Partner 1/Performance Management Reference*.

(c) Deleting the Stored Procedure

If you register the following stored procedure to the master database in the Microsoft SQL Server instance on the monitoring target host, delete the stored procedure.

- `R4QHITACHIPROCSPDATABASES`

Delete the stored procedure on the monitoring target host where the Microsoft SQL Server is running.

2.2.3 Procedure for uninstallation

To uninstall PFM - RM for Microsoft SQL Server:

1. On the host from which PFM - RM for Microsoft SQL Server is to be uninstalled, log on as a member of the Administrators group.
2. Stop all Performance Management programs and services on the local host.

   Display the service information to confirm that no programs are running.

   Stop all Performance Management programs and services running on the local host. This includes services running on both physical and logical hosts.

   For details about how to display service information and to stop services, see the chapter on starting and stopping Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.
3. Select the Performance Management program you want to uninstall.

   In Windows **Control Panel**, choose **Add/Remove Programs**, and then select the Performance Management program you want to uninstall.
4. Select **Remove** and click the **OK** button.

   The selected program is uninstalled.

Precautions regarding uninstallation on a Windows Server 2008 environment

If user account control functionality (UAC) is enabled on the OS, the User Account Control dialog box might be displayed during uninstallation. If this dialog box is displayed, click the Continue button to continue uninstallation, or click the Cancel button to cancel uninstallation.

2.3 Changing the system configuration of PFM - RM for Microsoft SQL Server

You might need to change the PFM - RM for Microsoft SQL Server system configuration because the network configuration or the host name of the monitored system has changed.

When you change the PFM - RM for Microsoft SQL Server system configuration, you must also change the settings for PFM - Manager and PFM - Web Console. For details about how to change the Performance Management system configuration, see the chapter on installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

2.4 Changing the operation of PFM - RM for Microsoft SQL Server

In some circumstances, such as when changes are made to the way in which collected operation monitoring data is utilized, you might need to change how PFM - RM for Microsoft SQL Server operates. For example, you might need to change the storage location of performance data or the instance environment.

This section describes how to change the operation of PFM - RM for Microsoft SQL Server. For details about changing operation across the entire Performance Management system, see the chapter on installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

2.4.1 Changing the storage location of performance data

The performance data collected by PFM - RM for Microsoft SQL Server is managed by using the Store database for the Remote Monitor Store service of PFM - RM for Microsoft SQL Server.

By executing `jpcconf db define` command, you can change the following storage folders for performance data managed by the Store database:

- Save folder
- Backup folder
- Partial backup destination folder
- Export folder
- Import destination folder

Use the `jpcconf db define` command with `-move` option if you want to copy the performance data to the new storage location of the Store database.

For details about the `jpcconf db define` command, see the manual *Job Management Partner 1/Performance Management Reference*.

The following table describes the options of the `jpcconf db define` command, including the values that can be specified.

Table 2-10: Settings related to the storage locations of performance data

Description	Option name	Specifiable value[#1]	Default[#2]
The folder in which performance data is stored	`sd`	Folder name, from 1 to 214 bytes	*installation-folder*`\agt4\store\`*instance-name*
The folder to which performance data is backed up	`bd`	Folder name, from 1 to 211 bytes	*installation-folder*`\agt4\store\`*instance-name*`\backup`
The folder to which performance data is partially backed up	`pbd`	Folder name, from 1 to 214 bytes	*installation-folder*`\agt4\store\`*instance-name*`\partial`
The maximum number of generations of performance data to be backed up	`bs`	1 to 9	`5`
The folder to which performance data is exported	`dd`	Folder name, from 1 to 127 bytes	*installation-folder*`\agt4\store\`*instance-name*`\dump`

Description	Option name	Specifiable value[#1]	Default[#2]
The folder to which performance data is imported	id	Folder name, from 1 to 222 bytes	*installation-folder*\agt4\store*instance-name*\import

#1

You must specify as the folder name either the relative path name from the default storage folder for the Store database (*installation-folder*\agt4*instance-name*) or the absolute path name.

#2

For the default save destination for logical host operation, replace *installation-folder* with *environment-folder* \jp1pc.

2.4.2 Updating a monitoring target

To update a monitoring target, check the name of the monitoring target that you want to update, and change the monitoring target information. Update a monitoring target on a PFM - RM host.

Before you change an information item, check the following table. For details about Microsoft SQL Server instance information, see your Microsoft SQL Server documentation.

Table 2-11: Monitoring target information of PFM - RM for Microsoft SQL Server

Item	Description	Specifiable value	Default value
TARGET_HOST	This item is updatable. Microsoft SQL Server host name for a monitoring target. If the Microsoft SQL Server host is a logical host, specify the logical host.	Host names can consist of 1 to 32 alphanumeric characters and hyphen. Note that you cannot specify a (logical) host name beginning with a hyphen. Physical and logical host names must be unique within the system.	Previous value
SQL_INSTANCE	This item is updatable. The instance name for monitoring target.	Specifiable value varies depending on how you install Microsoft SQL Server: If you install Microsoft SQL Server by default: [default] If you install Microsoft SQL Server and specify the instance name: [*the instance name you specified*]	Previous value
SQL_USER	This item is updatable. Specifies the user name for Microsoft SQL Server authentication.	The user account that has permissions equivalent to sa (the account of a member who has the sysadmin fixed server role). If you specify other user name, see *2.1.4(2)(d) Login permissions of the Microsoft SQL Server*.	Previous value
SQL_PASSWORD	This item is updatable. Specifies the password of the Microsoft SQL Server user used for Microsoft SQL Server authentication.	The password for SQL_USER.	Previous value
TIMEOUT	This item is updatable. Specifies the query timeout value for database access.	1 to 3,600 (seconds)	Previous value
LOGIN_TIMEOUT	This item is updatable.	1 to 3,600 (seconds)	Previous value

Item	Description	Specifiable value	Default value
LOGIN_TIMEOUT	Specifies the access timeout value for database access. The value is in seconds.	1 to 3,600 (seconds)	Previous value
DB_FREE_PERC_OPTION	This item is updatable. Specify how to display the value of Free % field in the PD_DS record when the value is negative.	{Y | N} If Y is specified, the value of DB_FREE_PERC_NUMBER is displayed as the value of Free % field when its value is negative. If N is specified, the value of Free % field is displayed as it is when its value is negative.	Previous value
DB_FREE_PERC_NUMBER	This item is updatable. Specify the value to replace the value of Free % in the PD_DS record when its value is negative. The replacement is enabled only when the value of DB_FREE_PERC_OPTION is Y.	-1 to 999	Previous value
LIMIT_PD_LD_NUMBER	This item is updatable. Specify the maximum number of collection records for the PD_LD record.	0 to 900,000 If you specify 0, no upper limit is set, and all data is collected.	Previous value

Legend:
--: No limit

To check the monitoring target name, use the `jpcconf target list` command. To update a monitoring target, use the `jpcconf target setup` command.

The following procedure shows how to update a monitoring target. If you want to update multiple monitoring target, repeat the procedure for each monitoring target.

1. Check the monitoring target name.

   Execute the `jpcconf target list` command specified with the service key and the instance name that indicate the PFM - RM for Microsoft SQL Server whose monitoring target host you are going to update.

   ```
   jpcconf target list -key RMSQL -inst instance-name
   Targets:
   targethost1
   targethost2
   Groups:
   All
   ```

2. Stop all the PFM - RM for Microsoft SQL Server services.

   For details about how to stop services, see the chapter on starting and stopping Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

3. Execute the `jpcconf target setup` command specified with the service key, the instance name, and the monitoring target name that indicate the PFM - RM for Microsoft SQL Server whose monitoring target host you are going to update.

   For example, if you update the monitoring target whose monitoring target name is targethost1, execute the following command:

   ```
   # jpcconf target setup -key RMSQL -inst instance-name -target targethost1
   ```

   Although an example of interactive command execution is shown here, the `jpcconf target setup` command can be also executed non-interactively. For details about the `jpcconf target setup` command, see the chapter that describes commands in the manual *Job Management Partner 1/Performance Management Reference*.

   Note that when you execute the `jpcconf target setup` command non-interactively, the operation in step 4 is not needed.

4. Update the monitoring target host of PFM - RM for Microsoft SQL Server.

Enter the information shown in table 2-11 in accordance with the command's instructions. The current settings are displayed. To use the displayed value, press the Enter key. When you have finished entering the information, the monitoring target host is updated.

5. Restart the service of the updated instance environment.

   For details about how to start and stop services, see the chapter on starting and stopping Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

Note:

When you update the monitoring target, make sure that you stop the services on that instance environment of the PFM - RM for Microsoft SQL Server.

If you execute `jpcconf target setup` to update the monitoring target while the services of the PFM - RM for Microsoft SQL Server is still running, the service of PFM - RM for Microsoft SQL Server updates the monitoring target, then the following message is output to the agent log, and PFM - RM for Microsoft SQL Server stops: "KAVL19848-E ".

To restart the collection of the performance information, restart the services of PFM - RM for Microsoft SQL Server.

For details about commands, see the chapter on commands in the manual *Job Management Partner 1/Performance Management Reference*.

2.4.3 Updating an instance environment

To update an instance environment, check the name of the instance that you want to update, and change the instance information. Update an instance environment on a PFM - RM host.

Before you change an information item, check the following table. For details about Microsoft SQL Server instance information, see your Microsoft SQL Server documentation.

Table 2-12: PFM - RM for Microsoft SQL Server instance information

Item	Description	Specifiable value	Default value
`LOG_PATH`	This item is updatable. Specifies the full path name of the folder for storing agent log information.	A character string of 245 or fewer bytes that does not include the following characters: • Tabs • The following symbols: `/ : , ; * ? " < > |`	Previous value
`LOG_SIZE`	This item is updatable. Specifies the maximum size of one agent log file.	1 to 32 (megabytes). The minimum recommended value is 16.	Previous value

Use the `jpcconf inst list` command to check the instance name. To update an instance environment, use the `jpcconf inst setup` command. For details about the command, see the chapter on the commands in the manual *Job Management Partner 1/Performance Management Reference*.

Updating an instance environment involves the steps described below. To update multiple instance environments, repeat the procedure for each instance environment.

1. Check the instance name.

   Execute the `jpcconf inst list` command specified with the service key that indicates PFM - RM for Microsoft SQL Server.

   For example, when you check the instance name of the PFM - RM for Microsoft SQL Server, execute the following command:

   ```
   jpcconf inst list -key RMSQL
   ```

   For example, if the instance name is SQL1, the command displays SQL1.

2. Stop all the PFM - RM for Microsoft SQL services.
   If the service is still active in the instance environment that is to be updated when you execute the `jpcconf inst setup` command, a confirmation message is displayed to enable you to stop the service. If you stop the service, update processing resumes; if you do not stop the service, update processing is canceled.
3. Execute the `jpcconf inst setup` command specified with the service key that indicates PFM - RM for Microsoft SQL Server and the instance name.
   For example, if you are updating the instance environment for the PFM - RM for Microsoft SQL Serer with instance name SQL1, execute the following command:
   ```
   jpcconf inst setup -key RMSQL -inst SQL1
   ```
   Although an example of interactive command execution is shown here, the `jpcconf inst setup` command can be also executed non-interactively.
   Note that when you execute the `jpcconf inst setup` command non-interactively, the operation in step 4 is not needed.
4. Update the instance information for Microsoft SQL Server.
   Enter the information shown in Table 2-12 in accordance with the command's instructions. The current settings are displayed. To use the displayed value, press the Enter key. When you have finished entering information, the instance environment is updated.
5. Restart the services in the updated instance environment.
   For details about starting services, see the chapter on starting and stopping Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

For details about commands, see the chapter on commands in the manual *Job Management Partner 1/Performance Management Reference*.

2.4.4 Checking how monitoring targets are configured

This subsection explains how to list the configured monitoring targets and check how they are configured.

(1) List the configured monitoring targets

You can list the monitoring targets per a remote agent or a group agent.

The following procedure describes how to list the monitoring targets:

1. Log in to the PFM - RM host.
2. Execute the `jpcconf target list` command.

(2) Check the configurations of monitoring targets

You can check the configurations per a remote agent or a group agent.

The following procedure describes how to check the configurations of monitoring targets.

1. Log in to the PFM - RM host.
2. Execute the `jpcconf target display` command.

2.5 Failover in the mirroring configuration

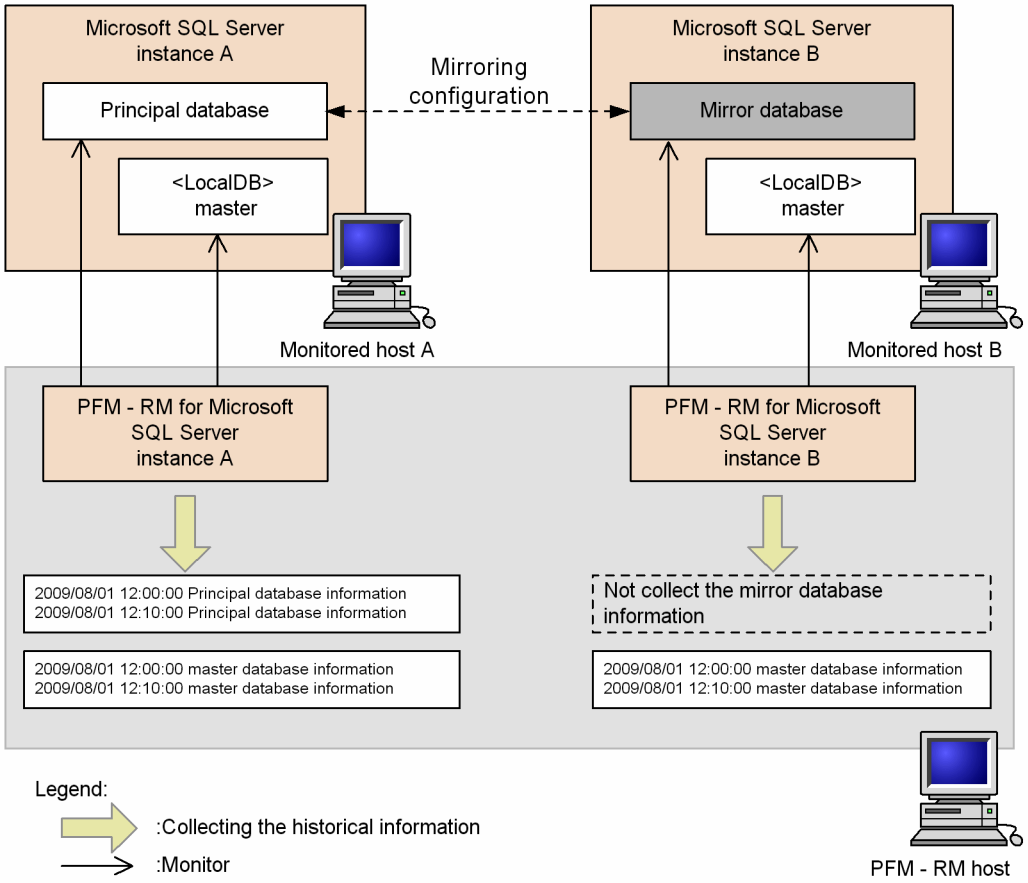
This section explains how PFM - RM for Microsoft SQL Server monitors the databases in the mirroring configuration and how PFM - RM for Microsoft SQL Server operates when the failover occurs in the databases in the mirroring configuration.

2.5.1 Monitoring databases in the mirroring configuration

When PFM - RM for Microsoft SQL Server monitors the databases in the mirroring configuration, PFM - RM for Microsoft SQL Server collects the performance information from the databases other than the mirror databases (such as the principal database and the database(s) in the non-mirroring configuration).

The following figure summarizes how PFM - RM for Microsoft SQL Server monitors the database in the mirroring configuration:

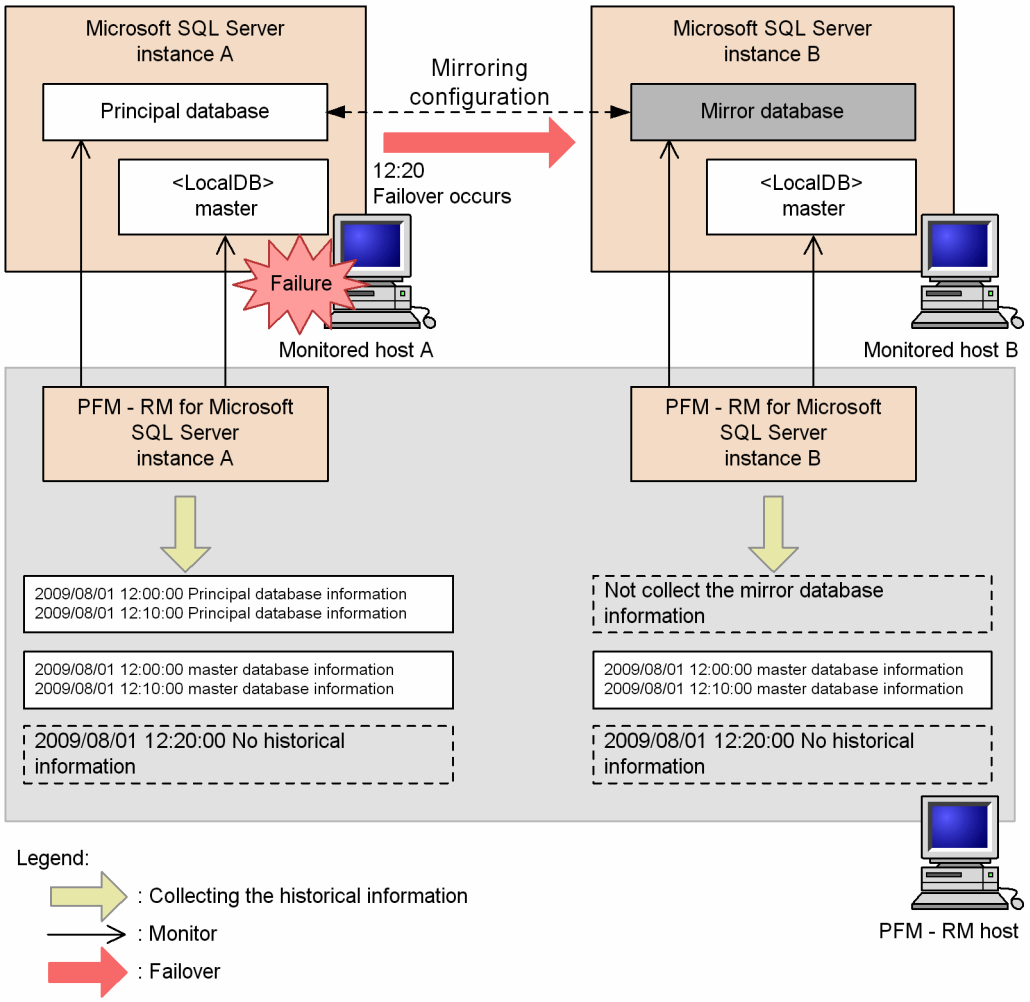
Figure 2-5: Overview of how PFM - RM for Microsoft SQL Server monitors the database in the mirroring configuration



2.5.2 Monitoring while a failover occurs in databases in the mirroring configuration

The following figure summarizes how PFM - RM for Microsoft SQL Server monitors the databases in the mirroring configuration while a failover occurs in those databases:

Figure 2-6: Overview of how PFM - RM for Microsoft SQL Server monitors the database in the mirroring configuration while a failover occurs.



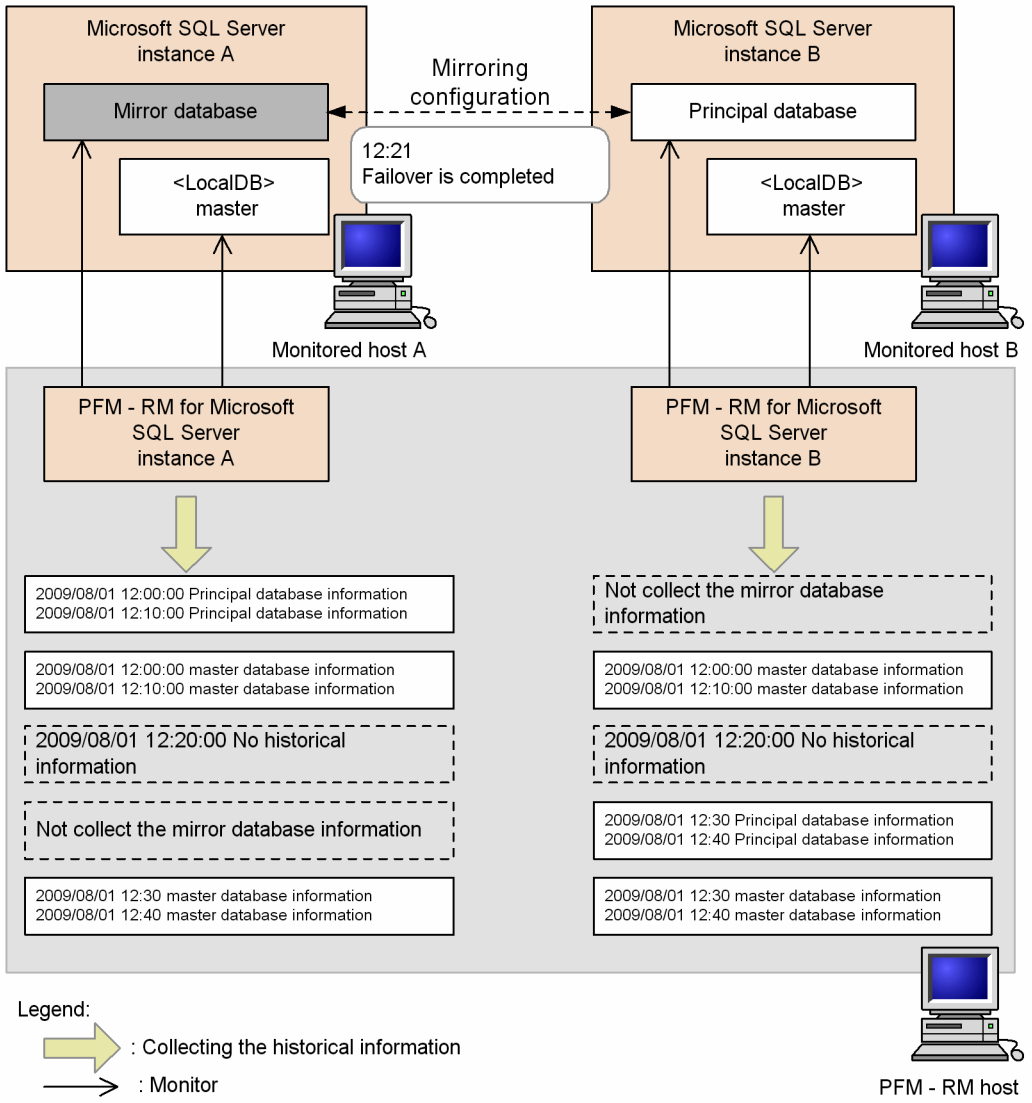
If a failover occurs in the databases in the mirroring configuration when PFM - RM for Microsoft SQL Server is collecting the performance information from the Microsoft SQL Server instance, PFM - RM for Microsoft SQL Server does not collect performance information from those instances just when the failover is occurring.

In this case, although "KAVL19812-E" message is output to the agent log, PFM - RM for Microsoft SQL Server operates properly.

2.5.3 Monitoring after a failover occurs in databases in the mirroring configuration

The following figure summarizes how PFM - RM for Microsoft SQL Server monitors the databases in the mirroring configuration after a failover occurs in those databases.

Figure 2-7: Monitoring after a failover occurs in databases in the mirroring configuration



After a failover completes, the former mirror database on the host B moves online as the new principal database and the former principal database takes on the role of the mirror database.

After the failover completes, the instance of the PFM - RM for Microsoft SQL Server which monitors the databases turned into the mirror databases (the instance A of the PFM - RM for Microsoft SQL Server on the figure 2-8) collects the performance information from the databases other than the mirror databases.

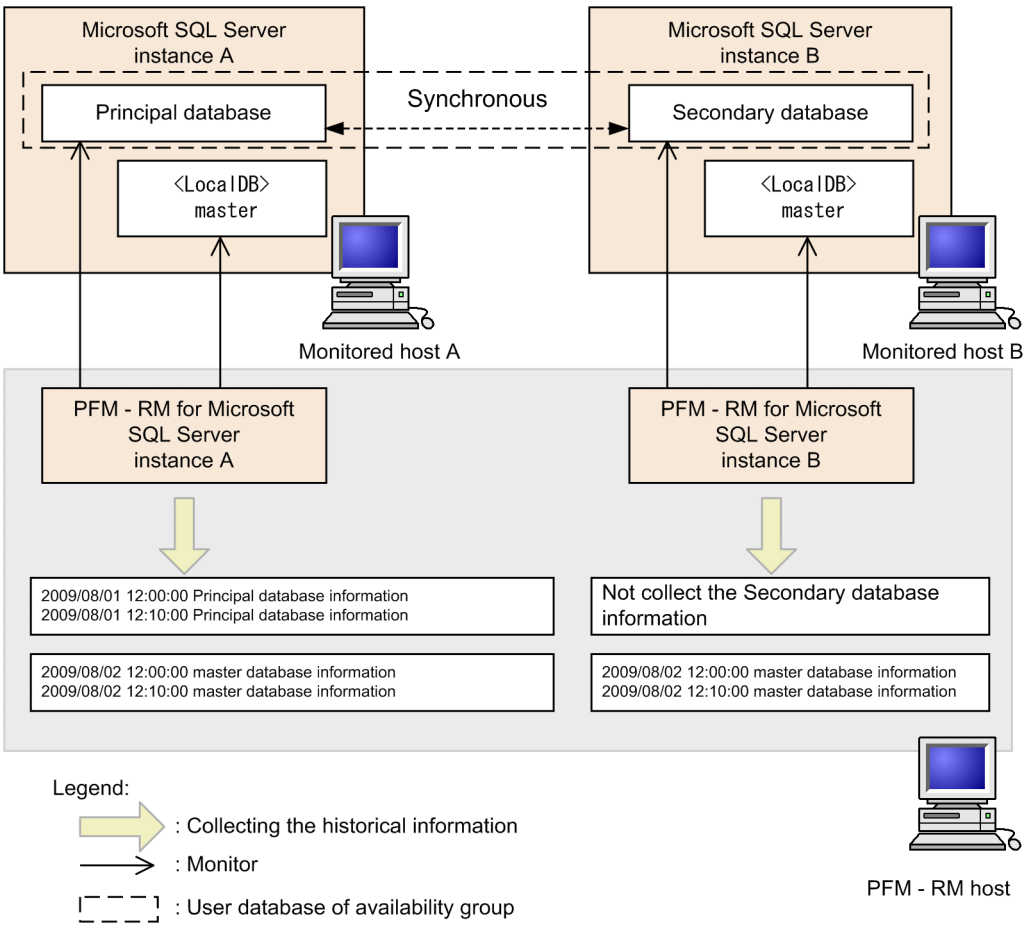
Moreover, the instance of the PFM - RM for Microsoft SQL Server which monitors the databases turned into the principal database (the instance B of the PFM - RM for Microsoft SQL Server on the figure 2-8) collects the performance information from the principal databases and the databases in non-mirroring configuration.

2.6 Monitoring in the SQL Server AlwaysOn Availability Group configuration

PFM - RM for Microsoft SQL Server collects information about the databases (primary database and secondary database) configured by using the SQL Server AlwaysOn Availability Group functionality. For the secondary database, information is collected only when all connections to it are permitted.

The following figure shows an example of the SQL Server AlwaysOn Availability Group configuration when not all of the connections to the secondary database are permitted.

Figure 2-8: Example of monitoring in the SQL Server AlwaysOn Availability Group configuration



For details about operation during or after failover of the primary database and secondary database, see *2.5 Failover in the mirroring configuration*.

2.6.1 Monitoring during failover in the SQL Server AlwaysOn Availability Group configuration

When PFM - RM for Microsoft SQL Server collects information for the instances of the Microsoft SQL Server that has databases in the SQL Server AlwaysOn Availability Group configuration, if a failover occurs, PFM - RM for Microsoft SQL Server does not collect information (at the time the failover occurs) for the instances of each database.

Also, the `KAVL19812-E` message is output to the agent log. However, there are no operational problems.

2.6.2 Monitoring after failover in the SQL Server AlwaysOn Availability Group configuration

After failover is complete, the primary database switches to host B, and the secondary database switches to host A.

After the failover, the PFM - RM for Microsoft SQL Server instance with the database that has switched to the secondary database collects the information for databases other than the secondary database. However, if all connections to the secondary database are permitted, the information for the secondary database can be also collected.

Also, the PFM - RM for Microsoft SQL Server instance with the database that switched to the primary database collects the information for the primary database and the databases that are not in the SQL Server AlwaysOn Availability Group configuration.

2.7 Backup and restoration

This section explains how to back up and restore PFM - RM for Microsoft SQL Server.

In preparation for the system failure due to errors, back up the configuration files. When you change the system configuration (such as setting up PFM - RM for Microsoft SQL Server), back up the configuration files.

For details about how to back up and restore the whole Performance Management system, see the chapter on backup and restoration in the *Job Management Partner 1/Performance Management User's Guide*.

2.7.1 Backup

When you back up the configuration files, you back up those files in any measure (such as copying the files). When you back up those configuration files, make sure that the PFM - RM for Microsoft SQL Server service is inactive before you back up the files.

Note:

When you back up the configuration files, record the product version number of PFM - RM for Microsoft SQL Server. For details about the product version number, see the *Release Notes*.

For backup, you need to save the instance and monitoring target configuration (including the logical host environment).

Table 2-14 shows the backup target files for PFM - RM for Microsoft SQL Server:

Table 2‑13: Backup target files for PFM - RM for Microsoft SQL Server

File name	Description
installation-folder#\agt4\agent*.ini files	Configuration files for Remote Monitor Collector service
installation-folder#\agt4\agent*instance-name**.ini files	
installation-folder#\agt4\agent*instance-name*\groups*.ini files	
installation-folder#\agt4\agent*instance-name*\targets*.ini files	
installation-folder#\agt4\store*.ini files	Configuration files for Remote Monitor Store service
installation-folder#\agt4\store*instance-name**.ini files	

#

If PFM - RM for Microsoft SQL Server runs on the logical host, replace *Installation-folder* with *environment-folder*\jp1pc. *Environment-folder* is the folder that is created on the shared disk when setting up the logical host.

2.7.2 Restoration

Make sure that you meet the following prerequisite conditions before you restore the backup files to the storage locations of those configuration files. Copy the backup files and overwrite the existing configuration files on PFM - RM host.

Prerequisites:

- Already install PFM - RM for Microsoft SQL Server
- PFM - RM for Microsoft SQL Server service is inactive.
- Instances and monitoring targets (including the logical host environment) were already set when the backup was created.

Note:

When you restore the configuration files for PFM - RM for Microsoft SQL Server, the product version number of the PFM - RM for Microsoft SQL Server on the backup environment is the same as that of the PFM - RM for

Microsoft SQL Server on the restoration target environment. For details about the product version number, see the *Release Notes*.

2.8 Online manuals

The standard manual CD-ROM accompanying the Performance Management program product contains a manual that you can copy to the host on which PFM - Web Console is installed and then view in a Web browser. Make sure that you copy the manual to the executing and standby nodes when PFM - Web Console runs in a cluster system.

2.8.1 Setting procedures

The following describes setting procedures required when you view the manual from the help menu bar of PFM - Web Console and when you view the manual on the hard disk of the machine being used.

(1) See the manual from the help menu bar of PFM - Web Console

The following describes the setting procedure required when you view the manual from the help menu bar of PFM - Web Console.

1. Register PFM - RM with PFM - Web Console, following the PFM - Web Console setup procedure (Follow the procedure to register an additional PFM - RM).
2. On the host on which PFM - Web Console is installed, create a directory to copy the manual to.
   - Windows: *Web-Console-installation-folder*`\doc\en\`*specify the help ID of PFM - RM for Microsoft SQL Server*
   - UNIX: `/opt/jp1pcwebcon/doc/en/`*specify the help ID of PFM - RM for Microsoft SQL Server*

   For the help ID, see *B. List of Identifiers*.
3. From the manual CD-ROM, copy all the manual files to the root of the directory you created.

   HTML manual:

   Windows: all the html files and FIGURE folder from *CD-ROM drive*`\MAN\3021\`*material-number* (such as 03004A0D)

   UNIX: all the html files and FIGURE folder from */CD-ROM mount point*`/MAN/3021/`*material-number* (such as 03004A0D)

   PDF manual:

   Windows: all the PDF files from *CD-ROM drive*`\MAN\3021\`*material-number* (such as 03004A0D)

   UNIX: all the PDF files from */CD-ROM mount point*`/MAN/3021/`*material-number* (such as 03004A0D)

   Make sure that you copy the index.htm files (for the HTML manual) or the PDF files (for the PDF manual) to the root of the created directory. For the copy procedure, see the readme.txt file on the manual CD-ROM.
4. Restart PFM - Web Console.

(2) See the manual from the hard disk

Execute the setup.exe command on CD-ROM to install the manual, or copy htm files, PDF files, and GIF files to any folders or directories. For HTML manual, the folder or directory organization must be:

```
html (storage folder or directory of the htm files and the PDF files)
 └ FIGURE (storage folder or directory of GIF files)
```

2.8.2 Viewing the manual

To view the manual:

1. In the menu bar of the PFM - Web Console main window, click Help. A help selection window appears.
2. Click the manual name, or click [PDF] after the manual name.
   Clicking the manual name displays the manual in HTML format. Clicking [PDF] displays the manual in PDF format.

Notes about displaying manuals in a Web browser

In Windows, if you display an online manual from the **Start** menu, the HTML manual may be displayed in the Web browser that is already open.

3 Operating PFM - RM for Microsoft SQL Server in a Cluster System

This chapter describes the procedures for installing and setting up PFM - RM for Microsoft SQL Server for use in a cluster system. This chapter also describes the flow of processing when you use PFM - RM for Microsoft SQL Server in a cluster system.

3.1 Cluster system overview

A *cluster system* is a system in which multiple server systems are linked and operated as a single system. The Microsoft SQL Server Database that is a monitoring target program of PFM - RM for Microsoft SQL Server can operate in the following cluster systems:

- An HA (High Availability) cluster system configured for Microsoft SQL Server
- A Federated database server configured for Microsoft SQL Server

This section describes the configuration you use for operating PFM - RM for Microsoft SQL Server in a cluster system. For an overview of cluster systems and information about the system configuration when you use a Performance Management system in a cluster system, see the chapter on operation in a cluster system in the *Job Management Partner 1/Performance Management User's Guide*.

The term *cluster system* when used alone in this chapter refers to an HA cluster system.

3.1.1 HA cluster system

There are two methods to operate PFM - RM for Microsoft SQL Server in an HA cluster system:

- Operate PFM - RM for Microsoft SQL Server when Microsoft SQL Server Database operates in an HA cluster system.
- Operate PFM - RM for Microsoft SQL Server in an HA cluster system.

The following describes the system configurations in each case.

(1) The system configuration of PFM - RM for Microsoft SQL Server monitoring Microsoft SQL Server Database in an HA cluster system

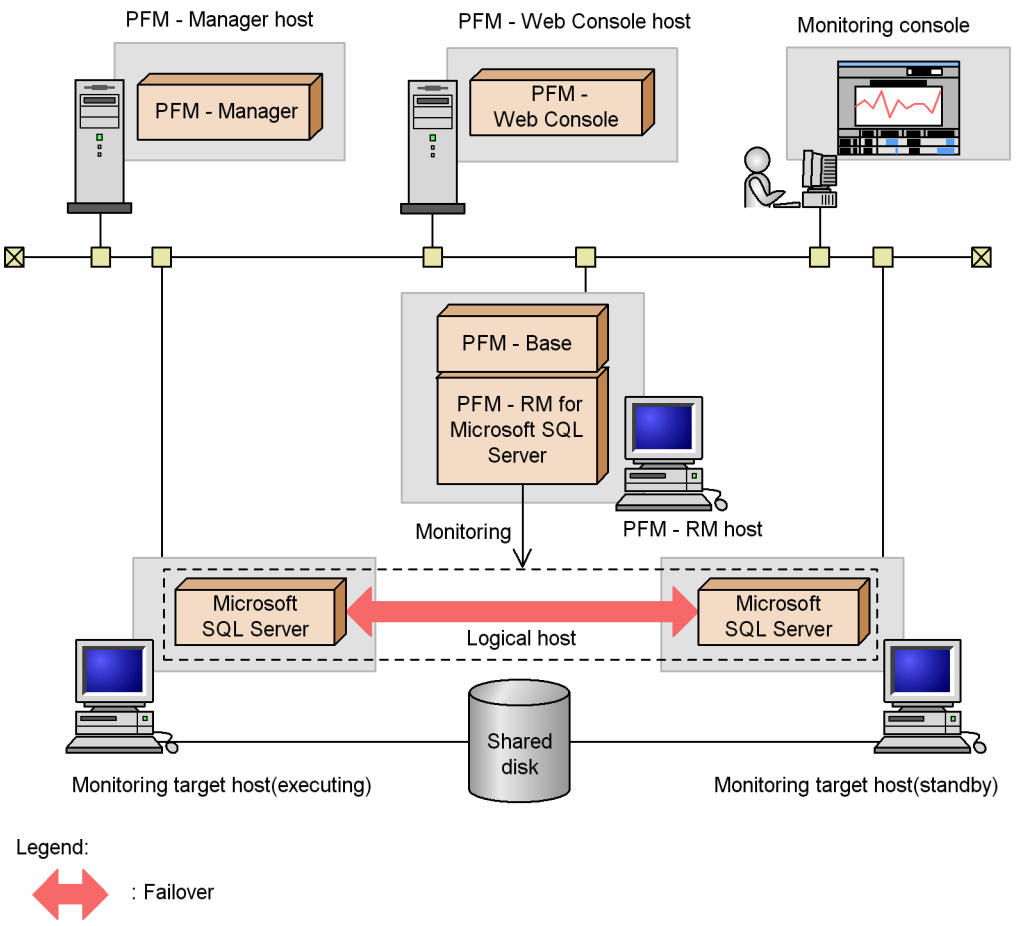
You can improve availability of an Microsoft SQL Server Database by using it in an HA cluster system, which can perform a failover if a failure occurs.

Typically, when you operate Microsoft SQL Server in an HA cluster system, you construct an environment that permits execution of the same Microsoft SQL Server instance on both an executing node and a standby node. The configuration you use stores a single set of Microsoft SQL Server data (data files, configuration files, log files, etc.) on a shared disk.

When you monitor Microsoft SQL Server in an HA cluster system by PFM - RM for Microsoft SQL Server, the network environment must be set up so that the host on which you install PFM - RM for Microsoft SQL Server can connect to the monitoring target Microsoft SQL Server host by its logical hostname and logical IP.

You can configure PFM - RM for Microsoft SQL Server as if PFM - RM for Microsoft SQL Server monitors an Microsoft SQL Server host in non-cluster system, when the monitoring target Microsoft SQL Server host is configured as in the following figures:

Figure 3-1: Example of PFM - RM for Microsoft SQL Server monitoring Microsoft SQL Server in HA cluster system

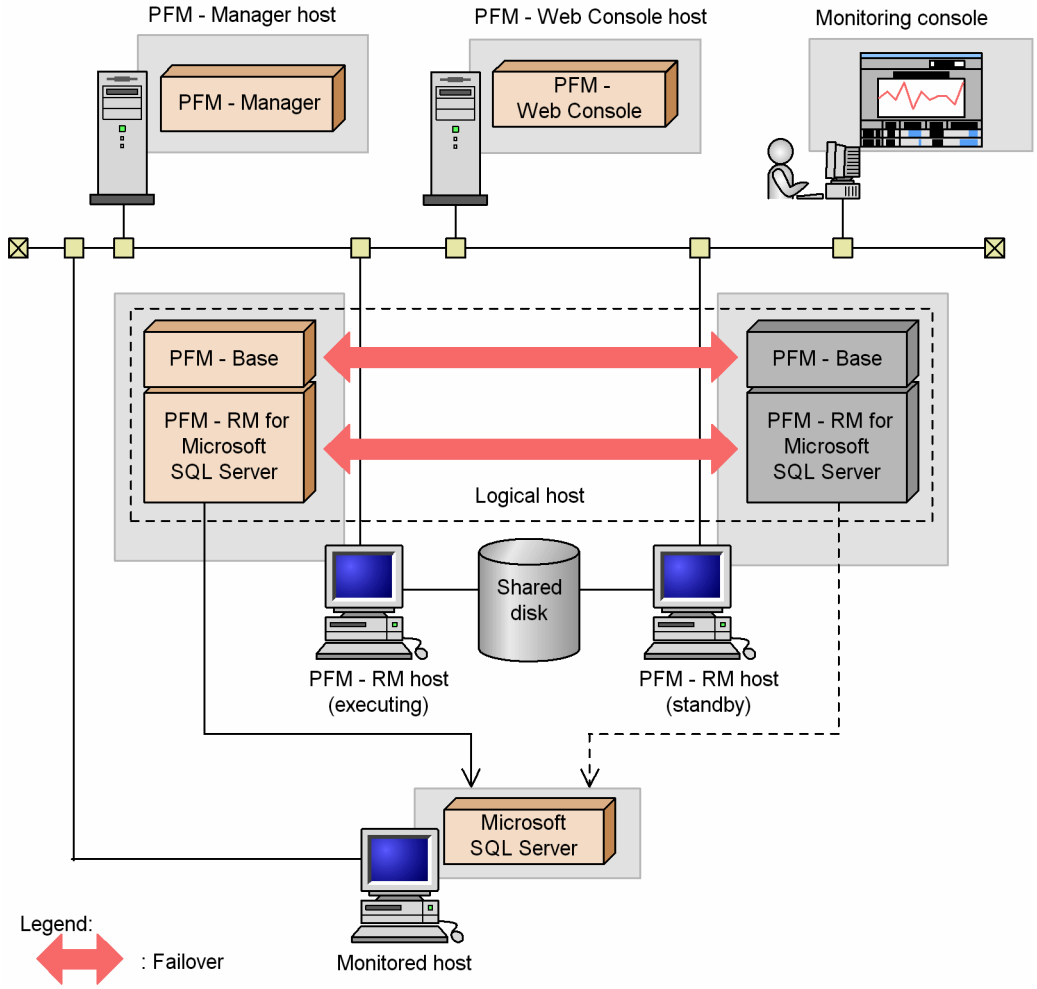


There are also cases when the configuration or method of operating Microsoft SQL Server in a cluster system depends on the system.

(2) PFM - RM for Microsoft SQL Server configuration in an HA cluster system

PFM - RM for Microsoft SQL Server can operate in an HA cluster system and can monitor Microsoft SQL Server in a cluster configuration. Figure 3-2 shows a configuration for operating PFM - RM for Microsoft SQL Server in an HA cluster system.

Figure 3-2: Example of an PFM - RM for Microsoft SQL Server configuration in an HA cluster system



As Figure 3-2 shows, PFM - RM for Microsoft SQL Server operates in a cluster system and monitors Microsoft SQL Server.

When a failure occurs, failover applies to PFM - RM for Microsoft SQL Server at the same time it applies to Microsoft SQL Server, allowing PFM - RM for Microsoft SQL Server to continue monitoring Microsoft SQL Server.

PFM - RM for Microsoft SQL Server also stores definition information about the shared disk and continues operating when a failover occurs. When there are multiple Performance Management programs on a single logical host, all programs use the same shared directories.

When you monitor multiple Microsoft SQL Servers, you can install PFM - RM for Microsoft SQL Server on separate logical hosts so that each PFM - RM for Microsoft SQL Server can operate and perform a failover independently.

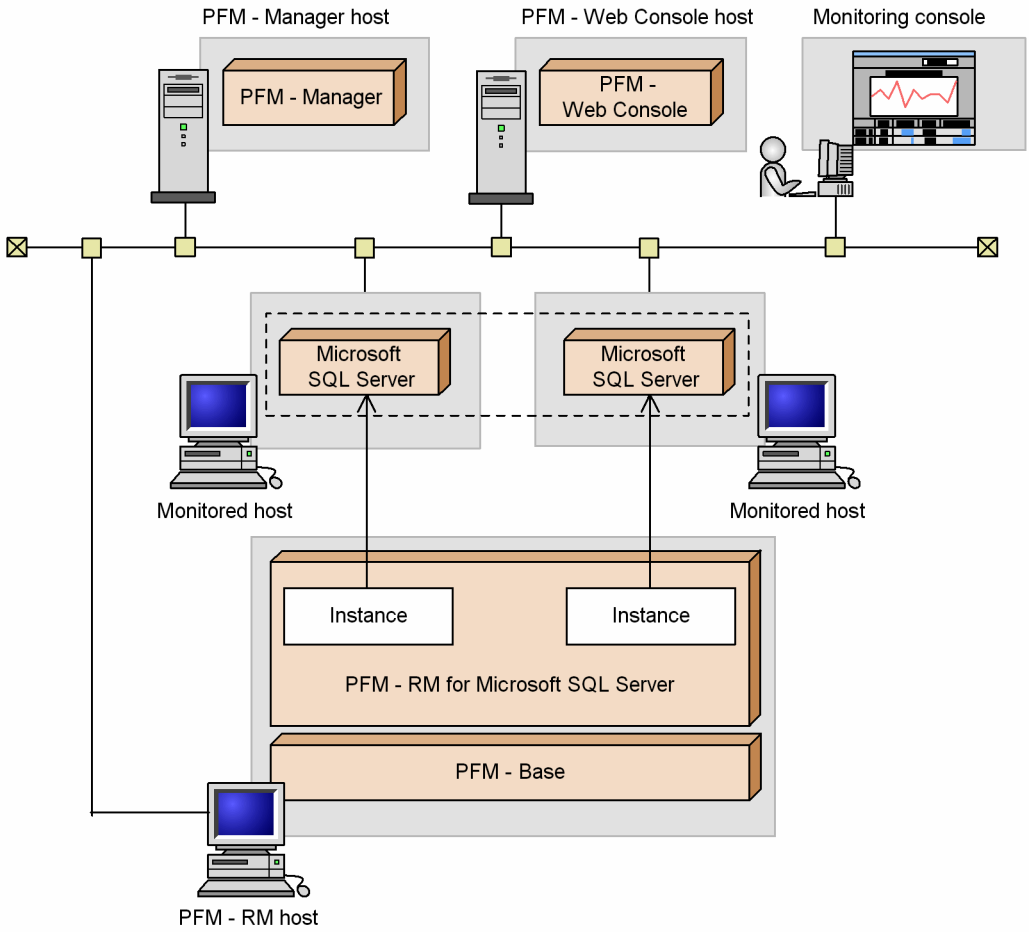
3.1.2 Federated database server

(1) The system configuration of PFM - RM for Microsoft SQL Server monitoring Microsoft SQL Server in a Federated database configuration

Federated database servers are cooperative group of databases which are joined together by horizontally partitioning the table across the nodes and thus creating a distributed partitioned view. Use this federated database server configuration when you make the group of the nodes cooperate so that you can process the data for a large Web site or a large company

Figure 3-3 shows a configuration for operating PFM - RM for Microsoft SQL Server in a federated database configuration:

Figure 3-3: Example of an PFM - RM for Microsoft SQL Server configuration in a federated database configuration



An Microsoft SQL Server system with a unique instance name is run on each node. PFM - RM for Microsoft SQL Server monitors the Microsoft SQL Server instance on each node.

As with a single-node system, set up PFM - RM for Microsoft SQL Server and configure it to monitor each node's Microsoft SQL Server Real Application Clusters instance.

Do not register PFM - RM for Microsoft SQL Server in the cluster software.

Note:

To operate PFM - RM for Microsoft SQL Server in a federated database server and monitor the federated database server, handle PFM - RM for Microsoft SQL Server as you would in a system with many single nodes. That is, handle it the same way as in a normal non-cluster system.

3.2 Processing during failover

When a failure occurs on the executing host, processing moves to the standby host.

This section describes how PFM - RM for Microsoft SQL Server operates during failover in the following two cases:

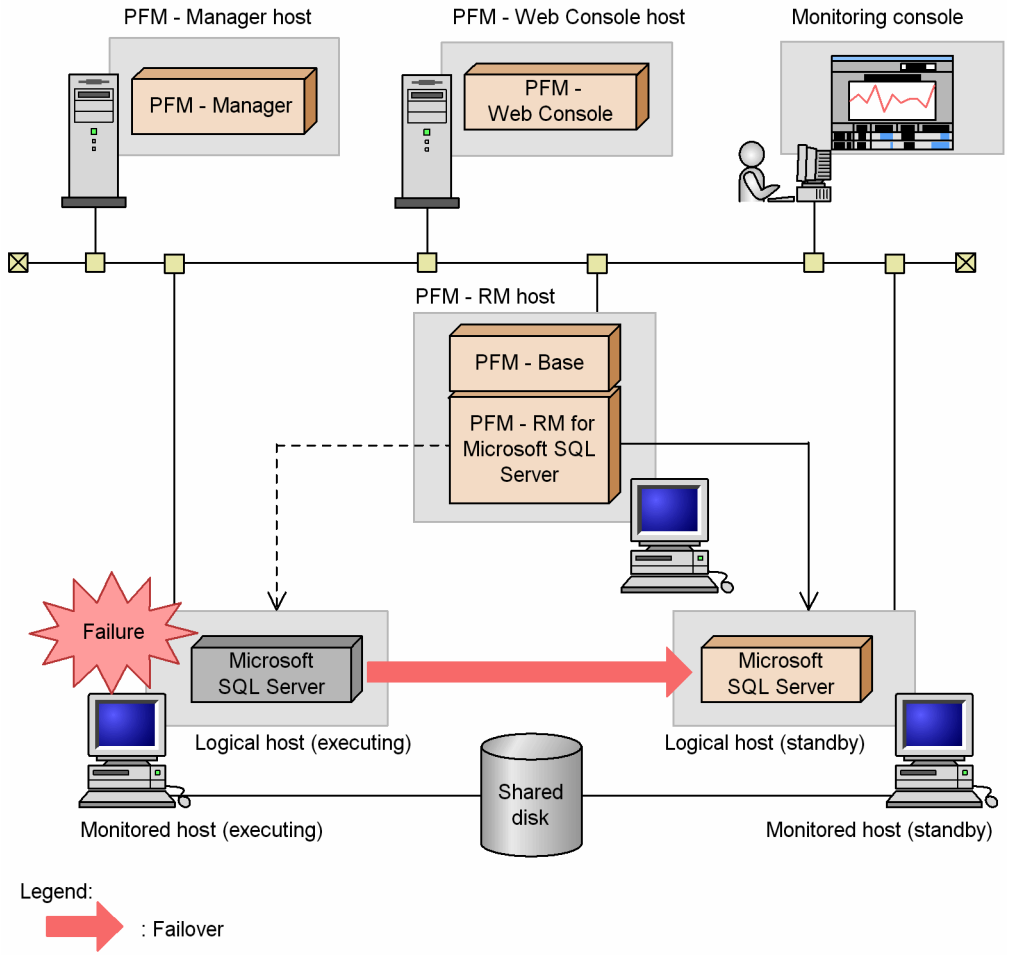
- Failure occurs on a monitoring Microsoft SQL Server host in a cluster system and failover happens
- Failure occurs on PFM - RM for Microsoft SQL Server host in a cluster system and failover happens

This section also describes the effect that PFM - Manager failures have on PFM - RM for Microsoft SQL Server.

3.2.1 Failover when a failure occurs on a monitoring host

Figure 3-4 shows the processing when failover occurs on a monitoring Microsoft SQL Server host.

Figure 3-4: Processing when a monitoring Microsoft SQL Server host performs failover



Note:

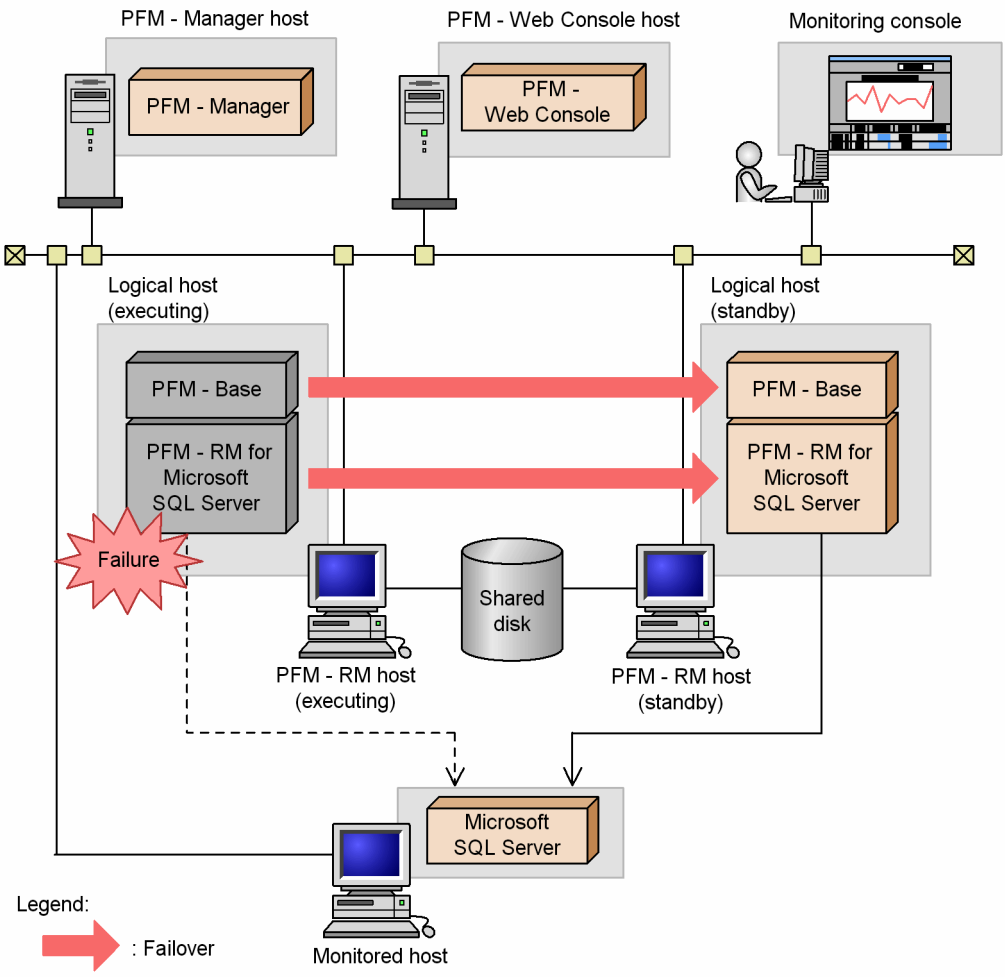
A failover on the monitoring Microsoft SQL Server host may cause temporary errors in the historical collection of the performance data.

Moreover, before and after the failover, the value of collected data may be negative. Note that for data after the failover is completed, positive values are used as the data differentials.

3.2.2 Failure occurs on PFM - RM for Microsoft SQL Server host

Figure 3-5 shows the processing when failover occurs on a PFM - RM for Microsoft SQL Server host.

Figure 3-5: Processing when a monitoring Microsoft SQL Server host performs failover



When you attempt to operate PFM - Web Console during failover of PFM - RM for Microsoft SQL Server, PFM - Web Console displays the message `There was no answer(-6)`. In such a case, wait for the failover to be completed before performing the PFM - Web Console operation.

Once PFM - RM for Microsoft SQL Server failover has been completed, you will be connected to the PFM - RM for Microsoft SQL Server that was started on the failover target node and you will again be able to operate PFM - Web Console.

Note:

A failover on the monitoring Microsoft SQL Server host may cause temporary errors in the historical collection of the performance data.

Moreover, before and after the failover, the value of collected data may be negative. Note that for data after the failover is completed, positive values are used as the data differentials.

3.2.3 Effects when PFM - Manager stops

PFM - Manager affects the entire Performance Management system when it stops.

PFM - Manager centrally manages the agent information of the PFM - RM for Microsoft SQL Server agents that are running on all nodes. It also controls notification of alarm events in the event a threshold value is exceeded during

performance monitoring by PFM - RM for Microsoft SQL Server as well as execution of actions based on alarm events. Accordingly, when PFM - Manager stops, the entire Performance Management system is affected, as described in Table 3-1.

Table 3-1: Effect on PFM - RM for Microsoft SQL Server when PFM - Manager stops

Program name	Effects	Solution
PFM - RM for Microsoft SQL Server	If PFM - Manager stops while PFM - RM for Microsoft SQL Server is running, PFM - RM for Microsoft SQL Server: • Continues collecting performance data. • Retains alarm events for each alarm definition and retries until PFM - Manager is recovered if it cannot send the alarm events to PFM - Manager. When the number of retained alarm events exceeds 3, the oldest alarm event is overwritten. If PFM - RM for Microsoft SQL Server is stopped, all the alarm events that have been retained are deleted. • Resets, when PFM - Manager is restarted, the alarm statuses that have already been reported to PFM - Manager. The alarm statuses are then initialized after checking with PFM - RM for Microsoft SQL Server. • Takes a long time to stop if you attempt to stop it, because PFM - Manager cannot be notified.	Start PFM - Manager. You can continue to run any PFM - RM for Microsoft SQL Server that is currently running. Check the common log after PFM - Manager is recovered because alarms may not be reported exactly as expected. (KAVE00024-I)

Consider the effects of stopping PFM - Manager when considering how to operate Performance Management. There are times when you have to stop PFM - Manager in order to change the configuration or perform maintenance work. Hitachi recommends that you schedule maintenance work for times that will have the least impact on operations.

3.3 Installation and setup

This section describes how to install and set up PFM - RM for Microsoft SQL Server in a cluster system.

Note that even if the monitoring Microsoft SQL Server host is in a cluster system you must perform an installation and setup procedures for a normal non-cluster system when PFM - RM for Microsoft SQL Server is in a non-cluster system. For details about the installation and setup procedure for a normal non-cluster system, see *2.1 Installation and setup*.

For details about how to install and set up PFM - Manager, see the chapters on setup and operation in a cluster system in the *Job Management Partner 1/Performance Management User's Guide*.

3.3.1 Preparation for installation and setup

This subsection describes the prerequisites for installation and setup, and provides cautionary notes and other information you should know before installing and setting up PFM - RM for Microsoft SQL Server.

(1) Prerequisites

The following are the prerequisites for running PFM - RM for Microsoft SQL Server in a cluster system.

(a) Cluster system

Make sure that the following conditions are satisfied:

- The cluster system is controlled by cluster software.
- The cluster software is able to start and stop PFM - RM for Microsoft SQL Server on a logical host.

Notes:

- Failover may not take place if Dr. Watson encounters an application error and displays a message box. For this reason, you must disable error notification that displays a message box. For details about the procedure, see the documentation for your OS. Note that disabling error notification may affect data collection when an application error occurs.
- When an application error occurs in Windows Server 2003, a dialog box giving you the option of reporting the problem to Microsoft appears. Because the dialog box can interfere with failover, you must disable error reporting. For details about disabling error reporting, see the documentation for the OS.

(b) Shared disk

Make sure that the following conditions are satisfied:

- Each logical host has a shared disk that the standby node can inherit from the executing node.
- The shared disk is physically connected to each node via a Fibre Channel, SCSI, or similar connection.

  Performance Management does not support the use of network drives or disks replicated over the network as the shared disk.
- If a failover is requested while a process is accessing the shared disk, the cluster software can take the shared disk offline and force a failover.
- Each instance of Performance Management programs on the same logical host uses the same directory on the shared disk.

  Note that you can change the location of the Store database to another directory on the shared disk.

(c) Logical host names and logical IP addresses

Make sure that the following conditions are satisfied:

- Each logical host has a logical host name and a corresponding logical IP address, which the standby node inherits from the executing node.
- Logical host names and logical IP addresses are set in the `hosts` file and on the name server.

- For DNS operation, host names in FQDN format cannot be used. For the logical host name, use the host name with the domain name portion removed.
- Physical host names and logical host names are unique within the system.

Notes:

- Do not specify the physical host name (the host name displayed by the `hostname` command) as the name of the logical host. If you do so, normal communication may not be possible.
- Logical host names can consist of 1 to 32 alphanumeric characters. A logical host name cannot include space characters or any of the following characters:
  `/ \ : ; * ? ' " < > | & = , .`
- You cannot specify `localhost`, an IP address, or a host name beginning with a hyphen (`-`) as a logical host name.

(d) Settings when IPv6 used

Performance Management supports IPv6 environments as well as IPv4 environments as a network configuration. Therefore, Performance Management can operate even in a network configuration in which both an IPv4 environment and an IPv6 environment are used.

PFM - RM for Microsoft SQL Server can communicate with PFM - Manager via IPv6.

Note that this explanation applies only when the OS of a host on which PFM - RM for Microsoft SQL Server is installed is Windows Server 2008 R2 or Windows Server 2012, and the OS of a host on which PFM - Manager is installed is Windows Server 2008 R2, Windows Server 2012 or Linux.

For details about the scope of communication in an environment with both IPv4 and IPv6, see *L. About Communication in IPv4 Environments and IPv6 Environments*.

When you want to use IPv6 for communication, the settings for using IPv6 need to be enabled on both the PFM - Manager host and the PFM - RM host. You can specify the settings by executing the `jpcconf ipv6 enable` command. The following describes when the command needs to be executed and when it does not need to be executed.

Cases when the `jpcconf ipv6 enable` command needs to be executed:

- When switching from an IPv4 environment to an IPv6 environment on each host
- When switching the PFM - Manager environment from IPv4 to IPv6 in an environment in which both IPv4 and IPv6 are used

Cases when the `jpcconf ipv6 enable` command does not need to be executed:

- When each host already operates in an IPv6 environment
- When PFM - Manager operates in an IPv6 environment in an environment in which both IPv4 and IPv6 are used

The following shows an example of executing the `jpcconf ipv6 enable` command:

```
jpcconf ipv6 enable
```

Execute the `jpcconf ipv6 enable` command separately on the executing node and on the standby node.

For details about the `jpcconf ipv6 enable` command, see the chapter that describes commands in the manual *Job Management Partner 1/Performance Management Reference*. For details about the conditions or occasions for executing the `jpcconf ipv6 enable` command, see the chapter that describes network configuration examples in an environment that includes IPv6 in the *Job Management Partner 1/Performance Management Planning and Configuration Guide.*

When you use IPv6 for communication between a monitored host and PFM - RM for Microsoft SQL Server, specify the name of a monitored host where name resolution can be performed.

Communication between PFM - RM for Microsoft SQL Server and a monitoring target is performed with an IP address that can be resolved. Also, if an IPv4 environment and an IPv6 environment are both used, and communication between PFM - RM for Microsoft SQL Server and the monitoring target fails with an IP address that can be resolved, the communication is not retried by using another IP address.

For example, if communication fails when IPv4 is used, IPv6 is not used to retry communication. Similarly, if communication fails when IPv6 is used, IPv4 is not used to retry communication. Make sure beforehand that a connection can be established.

(2) Information required to set up PFM - RM for Microsoft SQL Server to run on a logical host

When you set up PFM - RM for Microsoft SQL Server to run in a logical host environment, you must specify the information shown in the following table, in addition to the environment information required for PFM - RM for Microsoft SQL Server setup.

Table 3-2: Information required to set up PFM - RM for Microsoft SQL Server to run on a logical host

Item	Example
Logical host name	`jp1-halSQL`
Logical IP address	`172.16.92.100`
Shared disk	`S:\jp1`

When multiple Performance Management programs are installed on a single logical host, the programs share the same directory on the shared disk.

For details about how much shared disk capacity is needed, see *A. Estimating System Requirements*.

(3) Cautionary notes on failing over a logical host with PFM - RM for Microsoft SQL Server

In a system configuration in which PFM - RM for Microsoft SQL Server runs on a logical host, consider whether you want the entire logical host to fail over when an error occurs in PFM - RM for Microsoft SQL Server.

If the entire logical host is failed over when an error occurs in PFM - RM for Microsoft SQL Server, business applications on the same logical host will also be failed over. Failover of these applications may affect any business operations that are in progress.

(4) Cautionary notes on upgrading when Microsoft SQL Server runs on a logical host

When you upgrade PFM - RM for Microsoft SQL Server that runs on a logical host, you need to bring the shared disk on either the executing node or the standby node online.

3.3.2 Installation and setup workflow

The following figure shows the workflow for installing and setting up PFM - RM for Microsoft SQL Server to run on a logical host in a cluster system.

Figure 3-6: Workflow for installing and setting up PFM - RM for Microsoft SQL Server to run on a logical host in a cluster system

Note:

The definitions of PFM - RM for Microsoft SQL Server in a physical host environment cannot be inherited by setting up PFM - RM for Microsoft SQL Server in a logical host environment. For logical and physical host environments, a new environment is created when an instance environment is set up.

Note that you can select whether to execute a setup command requiring user entry interactively or non-interactively.

If you execute a setup command interactively, you need to enter a value in accordance with the command directives.

If you execute a setup command non-interactively, user entry is not required because the operator entry required during command execution can be replaced by the specification of options or definition files. Also, batch processing or remote execution can automate setup operations to reduce administrator workload and operating costs. Non-interactive commands are useful for the following case:

You want to regularly change the password to be used for connection with the monitoring target.

For details about commands, see the manual *Job Management Partner 1/Performance Management Reference*.

3.3.3 Installation procedure

Install PFM - RM for Microsoft SQL Server on the executing node and the standby node.

Note:

You must install PFM - RM for Microsoft SQL Server on a local disk. Do not install it on a shared disk.

The installation procedure is the same as the installation procedure in a non-cluster system. For details about the installation procedure, see *2.1.3 Installation procedure*.

3.3.4 Setup procedure

This subsection describes how to set up Performance Management to run in a cluster system.

When you want to operate Performance Management in a cluster system, setup is needed on both the executing node and the standby node. You must perform setup on the executing node before performing the setup on the standby node.

Executing indicates a task to be performed on the executing node. Standby indicates a task to be performed on the standby node. Option indicates a setup item that is required depending on the environment or an optional setup item used when the default is to be changed.

Important note

Because the `JPC_HOSTNAME` environment variable is used by Performance Management, do not set this environment variable elsewhere in the system. Doing so could disrupt Performance Management operation.

(1) Register PFM - RM for Microsoft SQL Server Executing Standby Option

To perform integrated management of PFM - RM using PFM - Manager and PFM - Web Console, you must register PFM - RM for Microsoft SQL Server with PFM - Manager and PFM - Web Console.

You will need to register PFM - RM for Microsoft SQL Server in the following cases:

- You add a new instance of PFM - RM for Microsoft SQL Server to the Performance Management system.
- You update the data model version of an instance of PFM - RM for Microsoft SQL Server that is already registered.

Registration is performed separately for PFM - Manager and PFM - Web Console. The registration procedure is the same as in the registration procedure in a non-cluster system.

For details about the procedure, see *2.1.4(1) Registering PFM - RM for Microsoft SQL Server*.

(2) Bring the shared disk online Executing

Make sure that the shared disk is online. If the shared disk is not online, use the cluster software or the volume manager to bring it online.

(3) Set up the logical host environment for PFM - RM for Microsoft SQL Server Executing

Execute the `jpcconf ha setup` command to set up the logical host environment. When you execute the command, the necessary files are copied to the shared disk, the logical host definition is set up, and the logical host environment is created.

Note:

Before you execute the command, stop all Performance Management programs and services throughout the Performance Management system. For details about how to stop services, see the chapter on starting and stopping Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

To set up the logical host environment:

1. Execute the `jpc conf ha setup` command to create the logical host environment for PFM - RM for Microsoft SQL Server.

   Execute the command as follows:

   ```
   jpcconf ha setup -key RMSQL -lhost jp1-halSQL -d S:\jp1
   ```

   Use the `-lhost` option to specify the logical host name. In the example above, the logical host name is `jp1-halSQL`. For DNS operation, specify a logical host name with the domain name portion removed.

   Specify the name of the shared disk directory as the environment directory name of the `-d` option. For example, if you specify `-d S:\jp1`, the directory `S:\jp1\jp1pc` is created, and the files for the logical host environment are created in that directory.

2. Execute the `jpcconf ha list` command to check the logical host settings.

   Execute the command as follows:

   ```
   jpcconf ha list -key all
   ```

   Confirm that the logical host environment you created has been set up correctly.

(4) Set the connection-target PFM - Manager Executing

Execute the `jpcconf mgrhost define` command to specify which PFM - Manager is to manage PFM - RM for Microsoft SQL Server.

1. Execute the `jpcconf mgrhost define` command to set the connection-target PFM - Manager.

   Execute the command as follows:

   ```
   jpcconf mgrhost define -host jp1-hal -lhost jp1-halSQL
   ```

   Use the `-host` option to specify the host name of the connection-target PFM - Manager. If that PFM - Manager is running in a logical host environment, specify the logical host name of the PFM - Manager in the `-host` option. In the example above, the logical host name of PFM - Manager is `jp1-hal`.

   Use the `-lhost` option to specify the logical host name of PFM - RM for Microsoft SQL Server. In the example above, the logical host name of PFM - RM for Microsoft SQL Server is `jp1-halora`.

   Although an example of interactive command execution is shown here, the `jpcconf mgrhost define` command can be also executed non-interactively. For details about the `jpcconf mgrhost define` command, see the chapter that describes commands in the manual *Job Management Partner 1/Performance Management Reference*.

(5) Set up an instance environment Executing

Execute the `jpcconf inst setup` command to set up an instance environment for PFM - RM for Microsoft SQL Server.

The setup procedure is the same as the setup procedure in a non-cluster system, except that, in a cluster system, you must specify the logical host name in the `-lhost` option when executing the `jpcconf inst setup` command.

In a cluster system, the `jpcconf inst setup` command is executed in the following format:

```
jpcconf inst setup -key RMSQL -lhost logical-host-name -inst instance-name
```

Although an example of interactive command execution is shown here, the `jpcconf inst setup` command can be also executed non-interactively. For details about the `jpcconf inst setup` command, see the chapter that describes commands in the manual *Job Management Partner 1/Performance Management Reference*.

As the agent log output folder (the value of `log_path`), specify the path of a folder that is on the shared disk.

For details about other settings and procedures, see *2.1.4(2) Setting up an instance environment*.

(6) Set the monitoring target Executing

Execute `jpcconf target setup` command to specify which Microsoft SQL Server host for PFM - RM for Microsoft SQL Server to monitor.

The setup procedure is the same as the setup procedure in a non-cluster system, except that, in a cluster system, you must specify the logical host name in the `-lhost` option when executing the `jpcconf target setup` command.

In a cluster system, the `jpcconf target setup` command is executed in the following format:

```
jpcconf target setup -key RMSQL -inst instance-name -target monitoring-target-name -lhost logical-host-name
```

Although an example of interactive command execution is shown here, the `jpcconf target setup` command can be also executed non-interactively. For details about the `jpcconf target setup` command, see the chapter that describes commands in the manual *Job Management Partner 1/Performance Management Reference*.

For details about other settings and procedures, see *2.1.4(2)(b) Set the monitoring target*.

If you use the Windows authentication, see *2.1.4(2)(c) Using Windows authentication*. For details about the login permissions of the Microsoft SQL Server, see *2.1.4(2)(d) Login permissions of the Microsoft SQL Server*.

(7) Registering the R4QHITACHIPROCSPDATABASES Stored Procedure

Executing

Option

Register the stored procedure in order for PFM - RM for Microsoft SQL Server to obtain the names and the sizes of the databases from Microsoft SQL Server

The registering procedure is the same as that of the non-cluster-system. For details, see *2.1.4(3) Registering the R4QHITACHIPROCSPDATABASES Stored Procedure*.

(8) Set up the logical host environment for other Performance Management programs

Executing

Option

At this point, set up any other Performance Management programs, such as PFM - Manager or PFM - RM, on the same logical host.

For details about how to set up these products, see the chapters on setup and operation in a cluster system in the *Job Management Partner 1/Performance Management User's Guide*, and the chapter on operation in a cluster system in the manuals for the applicable version of PFM - RM.

(9) Specify network settings

Executing

Option

This setup task is necessary only when you change the network settings to match the configuration in which Performance Management is used.

The following are the two network setting items:

- IP addresses

  To specify the IP address used by Performance Management in a network environment where multiple LANs are connected, directly edit the contents of the `jpchosts` file.

  After editing the file, copy it from the executing node to the standby node.

  For details about how to set IP addresses, see the chapter on installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide.*

- Port numbers

  If Performance Management programs will communicate with each other through a firewall, use the `jpcconf port` command to set the port numbers.

  For details about how to set port numbers, see the chapter on installation and setup and the chapters on setup and operation in a cluster system in the *Job Management Partner 1/Performance Management Planning and Configuration Guide.*

(10) Change the size of log files Executing Option

Performance Management outputs its operating status to a set of proprietary log files called a *common message log*. By default, the common message log consists of two 2,048 KB files. Perform this setting if you want to change the default file size.

For details, see the chapter on installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide.*

(11) Change the storage location of performance data Executing Option

Perform this setting only if you want to change the folders where the database of performance data managed by PFM - RM for Microsoft SQL Server is saved, backed up, exported, or imported.

For details, see *2.4.1 Changing the storage location of performance data*.

(12) Setting up the action log Executing Option

This setting is required to output action log when alarm occur. The action log stores history information that is output in conjunction with the alarms for thresholds related to system load and other conditions.

For details about how to set up the action log, see *J. Outputting Action Log Information*.

(13) Export the logical-host environment definition file Executing

Once you have created the logical host environment for PFM - RM for Microsoft SQL Server, export the environment definition as a file. In the export process, a file containing the collective definition information for all Performance Management programs set up on that logical host is output. Export the environment definition only after you have set up all additional Performance Management programs on the logical host.

To export the environment definition of the logical host:

1. Execute the `jpcconf ha export` command to export the environment definition of the logical host.

   The definition information for the logical host environment you created is output to an export file. You can give this file any name you wish.

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

   ```
   jpcconf ha export -f lhostexp.txt
   ```

   Although an example of interactive command execution is shown here, the `jpcconf ha export` command can be also executed non-interactively. For details about the `jpcconf ha export` command, see the chapter that describes commands in the manual *Job Management Partner 1/Performance Management Reference*.

(14) Copy the logical-host environment definition file to the standby node Executing Standby

Copy the file you exported in *(13) Export the logical-host environment definition file* from the executing node to the standby node.

(15) Take the shared disk offline Executing Option

Use the cluster software or the volume manager to take the shared disk offline. Note that if you intend to continue using the shared disk, you do not need to take it offline at this point.

(16) Import the logical-host environment definition file Standby

On the standby node, import the exported file you copied from the executing node.

Use the `jpcconf ha import` command to set up the environment definition for the Performance Management programs of the logical host that you created on the executing node so that they run on the standby node. If more than one Performance Management program was installed on the logical host, the definition information for all of the programs is imported in batch form.

Note that the shared disk does not need to be online when you execute this command.

To import the logical-host environment definition file:

1. Execute the `jpcconf ha import` command to import the environment definition of the logical host.

   Execute the command as follows:

   ```
   jpcconf ha import -f lhostexp.txt
   ```

   Although an example of interactive command execution is shown here, the `jpcconf ha import` command can be also executed non-interactively. For details about the `jpcconf ha import` command, see the chapter that describes commands in the manual *Job Management Partner 1/Performance Management Reference*.

   When you execute the command, the settings on the standby node are changed to reflect the environment described in the export file. This sets up the standby node to run PFM - RM for Microsoft SQL Server as a logical host.

   If you used the `jpcconf ha import` command to assign fixed port numbers during setup, the same port numbers will take effect on the standby node.

2. Set the login account for PFM - RM for Microsoft SQL Server service

   If you use the Windows authentication, change the login account for the PFM - RM for Microsoft SQL Server service on the standby node to the same login account as on the executing node in order for the PFM - RM for Microsoft SQL Server service to connect to the monitoring target Microsoft SQL Server.

3. Execute the `jpcconf ha list` command to check whether the logical host is set up correctly.

   Execute the command as follows:

   ```
   jpcconf ha list -key all
   ```

   Check whether the same output is displayed as when you executed `jpcconf ha list` on the executing node.

(17) Register PFM - RM for Microsoft SQL Server in the cluster software

Executing

Standby

If you intend to use Performance Management programs in a logical host environment, make sure that the programs are registered in the cluster software. Also, set up the environment so that the Performance Management programs are started and stopped based on instructions from the cluster software.

For details about how to register PFM - RM for Microsoft SQL Server in the cluster software, see your cluster software documentation.

This subsection describes how to register PFM - RM for Microsoft SQL Server in your cluster software, using the settings for Windows MSCS as an example.

Register the following services of PFM - RM for Microsoft SQL Server in the cluster software:

Table 3-3: PFM - RM for Microsoft SQL Server services to be registered in the cluster software

No.	Name	Service name	Dependencies
1	PFM - RM Store for Microsoft(R) SQL Server *instance-name* [*LHOST*]	`JP1PCAGT_4S_`*instance-name* [*LHOST*]	IP address resource Physical disk resource
2	PFM - RM for Microsoft SQL Server *instance-name* [*LHOST*]	`JP1PCAGT_4A_`*instance-name* [*LHOST*]	Cluster resource in No. 1
3	PFM - Action Handler [*LHOST*]	`JP1PCMGR_PH` [*LHOST*]	IP address resource Physical disk resource

Replace *LHOST* with the logical host name. For example, if the instance name is `SQL1` and the logical host name is `jp1-halSQL`, the display name of the service will be `PFM - RM Store for Microsoft(R) SQL Server SQL1 [jp1-halSQL]`, and the service name will be `JP1PCAGT_4S_SQL1 [jp1-halSQL]`.

When using MSCS as your cluster software, register the services as MSCS resources. Set up each resource according to the instructions below. Text in bold indicates a setting you perform in MSCS.

- Register the service with **Resource type** set to **General-Purpose service**.
- Set **Name**, **Dependency**, and **Service Name** as shown in Table 3-3.

  Note that the *Name* in the table is the display name of the service, and the *Service name* is the name MSCS uses to specify the service when issuing instructions
- Do not specify the **Startup Parameter** and **Duplicate Registry** settings.
- On the **Details** page of the **Properties** dialog box, choose how you want MSCS to behave when an error occurs in a Performance Management program.

  For example, if you want MSCS to fail over the node when PFM - RM for Microsoft SQL Server fails, perform the following settings:

  Restart: Select this check box.

  Apply to Group: Select this check box.

  Threshold for the restart retry count: 3#

  #

  Usually, specify 3 as the **Threshold** for the restart retry count.

Note:

The cluster software is responsible for starting and stopping the services that have been registered in it. Set **Startup type** for those services to **Manual** to prevent them from starting automatically when the OS starts. When you set up a service using the `jpcconf ha setup` command, **Startup type** for the service will be set to **Manual**. Also, do not use the following command to forcibly stop a service registered in the cluster software:

`jpcspm stop -key all -lhost` *logical-host-name* `-kill immediate`

(18) Check whether services can be started and stopped from the cluster software Executing Standby

Check whether the cluster software is operating correctly by using it to issue start and stop requests to Performance Management programs on each node.

(19) Set up the environment in the cluster system Executing Standby

After setting up the Performance Management programs, use PFM - Web Console to set up the environment for the programs. You will then be able to display reports on the operating status of monitoring targets, and notify users whenever a problem occurs.

For details about setting up the environment for Performance Management programs, see the chapters on setup and operation in a cluster system in the *Job Management Partner 1/Performance Management User's Guide*.

3.4 Setup cancellation and uninstallation

This section describes how to cancel setup of PFM - RM for Microsoft SQL Server and how to uninstall PFM - RM for Microsoft SQL Server in a cluster system.

For details about how to cancel setup of PFM - Manager and how to uninstall PFM - Manager, see the chapters on setup and operation in a cluster system in the *Job Management Partner 1/Performance Management User's Guide*.

3.4.1 Setup cancellation and uninstallation workflow of PFM - RM for Microsoft SQL Server

The following figure shows the setup cancellation and uninstallation workflow of PFM - RM for Microsoft SQL Server in a cluster system.

Figure 3-7: Setup cancellation and uninstallation workflow of PFM - RM for Microsoft SQL Server running on a logical host in a cluster system (Windows)

3.4.2 Setup cancellation procedure

This section describes the procedure for canceling setup of the logical host environment. There are separate procedures for the executing node and the standby node. Cancellation of setup must be performed first on the executing node and then on the standby node.

Executing indicates a task to be performed on the executing node. Standby indicates a task to be performed on the standby node. Option indicates a setup item that is required depending on the environment or an optional setup item used when the default is to be changed.

The following subsections describe how to cancel setup of PFM - RM for Microsoft SQL Server.

(1) Stop services from the cluster software Executing Standby

Stop the Performance Management programs and services running on the executing and standby nodes by using instructions from the cluster system. For details about how to stop the programs and services, see the documentation for your cluster software.

(2) Bring the shared disk online Executing

Make sure that the shared disk is online. If the shared disk is not online, use the cluster software or the volume manager to bring it online.

(3) Clear the port number settings Executing Option

Perform this step only if you are running a firewall environment, and you used the `jpcconf port` command to set port numbers during setup.

For details about how to clear the port number settings, see the chapter on uninstallation and unsetup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide* and see the chapters on setup and operation in a cluster system in the *Job Management Partner 1/Performance Management Guide.*

(4) Cancel setup of the logical host environments for PFM - RM for Microsoft SQL Server Executing

The following procedure shows how to cancel setup of the logical host environment for the executing node.

Note:

- If the shared disk is not mounted when you delete the logical host environment, the logical host settings are deleted from the physical host only, and the directories and files on the shared disk will remain. In this case, bring the shared disk online, and then manually delete the `jp1pc` directory from the environment directory.
- Use the `jpcconf target unsetup` command to delete the monitoring target while PFM - RM for Microsoft SQL Server on that instance environment stops.

  If you delete the monitoring target while PFM - RM for Microsoft SQL Server is still running, the service of PFM - RM for Microsoft SQL Server deletes the monitoring target, then the following message is output to the agent log, and PFM - RM for Microsoft SQL Server stops: "`KAVL19848-E`".

To cancel setup of the logical host environment for the executing node:

1. Execute the `jpcconf ha list` command to check the logical host settings.

   Execute the command as follows:

   ```
   jpcconf ha list -key all -lhost jp1-halSQL
   ```

   Before canceling setup of the logical host environment, check the current settings, including the logical host name and the path to the shared disk.

2. Execute the `jpcconf target unsetup` command to clear the monitoring host setting

   Execute the command as follows:

   ```
   jpcconf target unsetup -key RMSQL -inst SQL1 -target monitoring-target-name
   -lhost jp1-halSQL
   ```

   When you execute `jpcconf target unsetup` command, the monitoring host is no longer monitored.

3. Execute the `jpcconf inst unsetup` command to delete the instance environment.

   Execute the command as follows:

```
jpcconf inst unsetup -key RMSQL -lhost jp1-halSQL -inst SQL1
```

Although an example of interactive command execution is shown here, the `jpcconf inst unsetup` command can be also executed non-interactively. For details about the `jpcconf inst unsetup` command, see the chapter that describes commands in the manual *Job Management Partner 1/Performance Management Reference*.

When you execute the `jpcconf inst unsetup` command, the settings that allow the instance to start on the logical host are deleted. The files on the shared disk that relate to the logical host are also deleted.

4. Execute the `jpcconf ha unsetup` command to delete the logical host environment for PFM - RM for Microsoft SQL Server.

   Execute the command as follows:

   ```
   jpcconf ha unsetup -key RMSQL -lhost jp1-halSQL
   ```

   When you execute the `jpcconf ha unsetup` command, the settings that allow the instance to start on the logical host are deleted. Files on the shared disk that relate to the logical host are also deleted.

5. Use the `jpcconf ha list` command to check the logical host settings.

   Execute the command as follows:

   ```
   jpchasetup list -key all
   ```

   Confirm that PFM - RM for Microsoft SQL Server has been deleted from the logical host environment.

(5) Cancel setup of the logical host environments for other Performance Management programs Executing Option

If there are Performance Management programs for which you want to cancel setup in addition to PFM - RM for Microsoft SQL Server on the same logical host, cancel setup of these at this point.

For details about how to cancel setup, see the chapters on setup and operation in a cluster system in the *Job Management Partner 1/Performance Management User's Guide*, or the chapters on operation in a cluster system in the applicable PFM - RM manual.

(6) Export the logical-host environment definition file Executing

After you have deleted PFM - RM for Microsoft SQL Server from the logical host, export the environment definition as a file.

Performance Management allows you to synchronize the environments on the executing node and standby node by exporting the environment definition from one node and importing it into the other.

When you import the environment definition (without the Performance Management component) from the executing node into the standby node, the imported environment definition is compared with the existing environment definition (containing the Performance Management component) and the difference between the two is verified. The Performance Management environment definition is then cleared from the standby node so that both nodes have the same environment.

To export the logical-host environment definition file:

1. Execute the `jpcconf ha export` command to export the logical host environment definition.

   The definition information for the logical host environment of Performance Management is output to an export file. You can give this file any name you wish.

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

   ```
   jpcconf ha export -f lhostexp.txt
   ```

   Although an example of interactive command execution is shown here, the `jpcconf ha export` command can be also executed non-interactively. For details about the `jpcconf ha export` command, see the chapter that describes commands in the manual *Job Management Partner 1/Performance Management Reference*.

(7) Copy the logical-host environment definition file to the standby node Executing Standby

Copy the file you exported in *(6) Export the logical-host environment definition file* from the executing node to the standby node.

(8) Take the shared disk offline Executing Option

Use the cluster software or the volume manager to take the shared disk offline. Note that if you intend to continue using the shared disk, you do not need to take it offline at this point.

(9) Import the logical-host environment definition file Standby

On the standby node, import the exported file you copied from the executing node in order to synchronize the environment definitions of both nodes. You do not need to take the shared disk offline on the standby node before importing the file. Note that the shared disk does not need to be offline when you execute this command.

To import the logical-host environment definition file:

1. Execute the `jpcconf ha import` command to import the environment definition of the logical host.
   Execute the command as follows:
   ```
   jpcconf ha import -f lhostexp.txt
   ```
   Although an example of interactive command execution is shown here, the `jpcconf ha import` command can be also executed non-interactively. For details about the `jpcconf ha import` command, see the chapter that describes commands in the manual *Job Management Partner 1/Performance Management Reference*.
   When you execute the command, the environment on the standby node is changed to reflect the environment described in the export file. This clears the settings that allow PFM - RM for Microsoft SQL Server to start on the logical host. These settings are also cleared for any other Performance Management programs for which you cancel setup on the logical host.
   If you used the `jpcconf port` command during setup to assign fixed port numbers, the port numbers will no longer be assigned.
2. Execute the `jpcconf ha list` command to check the logical host settings.
   Execute the command as follows:
   ```
   jpcconf ha list -key all
   ```
   Confirm whether the same output is displayed as when you executed the `jpcconf ha list` command on the executing node.

(10) Unregister PFM - RM for Microsoft SQL Server in the cluster software Executing Standby

Delete the settings related to PFM - RM for Microsoft SQL Server on the logical host from the cluster software.

For details about deleting these settings, see the documentation for your cluster software.

(11) Delete settings from PFM - Manager Executing Standby

Log in to PFM - Manager from PFM - Web Console, and delete the definition relating to the PFM - RM for Microsoft SQL Server for which you want to cancel setup.

To delete the definition:

1. From PFM - Web Console, delete the agent.
2. Delete the agent information in PFM - Manager.
   For example, if PFM - Manager is running on the logical host `jp1-hal`, and PFM - RM for Microsoft SQL Server is running on the logical host `jp1-halora`, execute the following command to delete the agent:
   ```
   jpctool service delete -id service-ID -host jp1-halSQL -lhost jp1-hal
   ```
   In *service-ID*, specify the service ID of the agent you want to delete.
3. Restart the PFM - Manager service.
   For details about how to start services, see the chapter on starting and stopping Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.
4. Apply the service information of the PFM - Manager host.

In order to update the PFM - Web Console host to reflect the deletion of service information, synchronize the agent information of the PFM - Manager host and that of the PFM - Web Console host. Use the `jpctool service sync` command to synchronize the agent information.

3.4.3 Uninstallation procedure

Uninstall PFM - RM for Microsoft SQL Server from the executing and standby nodes.

The uninstallation procedure is the same as the uninstallation procedure in a non-cluster system. For details, see *2.2.3 Procedure for uninstallation*.

Notes:

- Before you uninstall PFM - RM for Microsoft SQL Server, stop all Performance Management programs and services on the node from which you are uninstalling PFM - RM for Microsoft SQL Server.
- If you uninstalled PFM - RM for Microsoft SQL Server without deleting the logical host environment, the environment directory may remain on the disk. In this case, delete the environment directory manually.

3.5 Changing the system configuration of PFM - RM for Microsoft SQL Server

Depending on the change in the network configuration of a monitored system or a change in the host name, you might need to change the system configuration of PFM - RM for Microsoft SQL Server.

When you change the system configuration of PFM - RM for Microsoft SQL Server, you also need to change the settings of PFM - Manager or PFM - Web Console. For details about how to change the system configuration of Performance Management, see the chapter that describes installation and setup in the *Job Management Partner 1/ Performance Management Planning and Configuration Guide*.

3.6 Changing the operation of PFM - RM for Microsoft SQL Server

This section describes how to change the operation of PFM - RM for Microsoft SQL Server in a cluster system. For details about how to change the configuration of the whole Performance Management system, see the chapter on the installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

3.6.1 Updating a monitoring target

When you update a monitoring target, you first check the logical host name, the instance name, and the monitoring target name. You update a monitoring target host on the executing node.

Before you change an information item, see *2.4.2 Updating a monitoring target* in advance. For details about Microsoft SQL Server monitoring-target information, see your Microsoft SQL Server documentation.

Use the `jpcconf ha list` command to check the logical host name and the instance name. To check the monitoring target name, use the `jpcconf target list` command.

Use the `jpcconf target setup` command to update a monitoring target name.

Updating a monitoring target host involves the steps described below. To update multiple monitoring target hosts, repeat the procedure for each monitoring target host.

1. Check the monitoring target name

   Execute the `jpcconf target list` command specified with the service key and the instance name that indicate the PFM - RM for Microsoft SQL Server whose monitoring target you are going to update.

   ```
   jpcconf target list -key RMSQL -inst instance-name -lhost logical-host-name
   Execution of this command displays the following items:
   Targets:
   targethost1
   targethost2
   Groups:
   All
   ```

2. If the PFM - RM for Microsoft SQL Server service is active in the instance environment that is to be updated, use the cluster software to stop the service.

   For details about stopping the services, see the chapter on starting and stopping Performance Management in a cluster system in the *Job Management Partner 1/Performance Management User's Guide*.

3. If the shared disk is unmounted when you stop the service, use the cluster software or the volume manager to mount it.

4. Execute the `jpcconf target setup` command specified with the service key, the instance name, and the monitoring target name that indicate the PFM - RM for Microsoft SQL Server whose monitoring target host you are going to update.

   For example, if you update the monitoring target whose monitoring target name is targethost1, execute the following command:

   ```
   jpcconf target setup -key RMSQL -inst instance-name -target targethost1
   ```

   Although an example of interactive command execution is shown here, the `jpcconf target setup` command can also be executed non-interactively. If you execute the `jpcconf target setup` command non-interactively, the operation in step 5 is not needed.

5. Update the monitoring target host of PFM - RM for Microsoft SQL Server.

   Enter the information shown in the Table 2-11 in accordance with the command's instructions. The current settings are displayed. To use the displayed value, press the **Enter** key. When you have finished entering the information, the monitoring target is updated.

6. Use the cluster software to restart the service in the updated instance environment.

   For details about the starting the service, see the chapter on starting and stopping Performance Management in a cluster system in the *Job Management Partner 1/Performance Management User's Guide*.

Important note

If you want to change an item that cannot be updated, delete the monitoring target information and then re-create it.

For details about the command, see the chapter that describes commands in the manual *Job Management Partner 1/ Performance Management Reference*.

Note:

When you update the monitoring target, make sure that you stop the services on that instance environment of the PFM - RM for Microsoft SQL Server.

If you execute the jpcconf target setup command to update the monitoring target while the services of the PFM - RM for Microsoft SQL Server is still running, the service of PFM - RM for Microsoft SQL Server updates the monitoring target, then the following message is out put to the agent log, and PFM - RM for Microsoft SQL Server stops: "KAVL19848-E".

To restart the collection of the performance information, restart the services of PFM - RM for Microsoft SQL Server.

3.6.2 Updating an instance environment

When you update an instance environment in a cluster system, you first check the logical host name and the name of the instance that you want to update. You update the instance information on the executing node.

Before you change the information items, see in advance *2.4.3 Updating an instance environment*.

For details about Microsoft SQL Server instance information, see your Microsoft SQL Server documentation.

Use the `jpcconf ha list` command to check the instance name. To update an instance environment, use the `jpcconf inst setup` command.

Updating an instance environment involves the steps described below. To update multiple instance environments, repeat the procedure for each instance environment.

1. Check the logical host name and the instance name

   Execute the `jpcconf ha list` command specified with the service key that indicates the PFM - RM for Microsoft SQL Server in the instance environment that is to be updated:

   ```
   jpcconf ha list -key RMSQL
   ```

   For example, if you execute the command in the system with logical host name jp1_SQL and instance name SQL1, the command will list the following information:

Logical Host Name	Key	Environment Directory	Instance Name
jp1_SQL	RMSQL	*Path to the logical host environment directory*	SQL1

2. If the PFM - RM for Microsoft SQL Server service is active in the instance environment that is to be updated, use the cluster software to stop the service.
3. If the shared disk is unmounted when you stop the service, use the cluster software or the volume manager to mount it.
4. Execute the `jpcconf inst setup` command specified with the service key and the instance name that indicate the PFM - RM for Microsoft SQL Server in the instance environment that is to be updated.

   For example, if you are updating the instance environment with logical host name jp1_SQL and instance name SQL1, execute the following command:

   ```
   jpcconf inst setup -key RMSQL -lhost jp1_SQL -inst SQL1
   ```

   Although an example of interactive command execution is shown here, the `jpcconf inst setup` command can also be executed non-interactively. If you execute the `jpcconf inst setup` command non-interactively, the operation in step 5 is not needed.
5. Update the instance information for PFM - RM for Microsoft SQL Server.

   Enter the information in accordance with the command's instructions. For details about the instance information of PFM - RM for Microsoft SQL Server, see *2.4.3 Updating an instance environment*. The current settings are displayed (except for the value of Microsoft SQL Server_passwd). To use the displayed value, press the Enter key. When you have finished entering information, the instance environment is updated.

6. Use the cluster software to restart the service in the updated instance environment.
   For details about the starting the service, see the chapter on starting and stopping Performance Management in a cluster system in the *Job Management Partner 1/Performance Management User's Guide*.

   ! Important note

   If you want to change an item that cannot be updated, delete the instance environment and then re-create it.

For details about the commands used in this procedure, see the chapter on the commands in the manual *Job Management Partner 1/Performance Management Reference*.

3.6.3 Exporting and importing the logical-host environment definition file

You must export and import the logical-host environment definition file only if you perform any one of these operations listed below:

- When you set up the logical host environment, the instance environment, or the monitoring target, you also change the node system on the logical host.
  For details about how to set up the PFM - RM for Microsoft SQL Server logical host, see *3.3.4(3) Set up the logical host environment for PFM - RM for Microsoft SQL Server*.
  For details about how to set up the instance environment, see *3.3.4(5) Set up an instance environment*.
  For details about how to set up the monitoring target, see *3.3.4(6) Set the monitoring target*.
- When you set up the logical host environment of other Performance Management programs, you perform an operation that requires exporting and importing the logical-host environment definition file.
  For details about the procedures for setting up the logical host environment for other Performance Management program, see *3.3.4(8) Set up the logical host environment for other Performance Management programs*.
- When you specify network setting, you set the port numbers.
  For details about how to specify the network settings, see *3.3.4(9) Specify network settings*.
  For details about the procedure for exporting and importing the logical-host-environment definition files, see from *3.3.4(13) Export the logical-host environment definition file* to *3.3.4(16) Import the logical-host environment definition file*.

Note that you do not have to export and import the logical-host environment definition file when you update a monitoring target host and/or an instance environment.

For details about how to update a monitoring target, see *3.6.1 Updating a monitoring target*. For details about how to update an instance environment, see *3.6.2 Updating an instance environment*.

3.7 Notes on operating PFM - RM for Microsoft SQL Server in a cluster system

This section provides notes on operating PFM - RM for Microsoft SQL Server in a cluster system.

3.7.1 Host name in the collected performance data

The performance data PFM - RM for Microsoft SQL Server collects includes a record that contains fields related to the host name. In the case of PFM - RM for Microsoft SQL Server running on a logical host, the value of the Host field is either the physical host name or the logical host name. The table 3-4 lists the records containing the host-name-related field:

Table 3-4: Records containing the host-name-related field

Record name	Field name	Stored host name	Description
Process Detail (PD_PDET)	Host	Physical host / logical host	Host name for the process running on the Microsoft SQL Server host.

3.7.2 Log output for a cluster system

If the monitoring-target Microsoft SQL Sever is in a cluster configuration, the following log information (example) is output to the log file because a failover occurs on a Microsoft SQL Server host and the Microsoft SQL Server on that host stops.

Regardless of this error message, PFM - RM for Microsoft SQL Server continues to operate properly. After the startup process of the monitoring-target Microsoft SQL Server is completed, PFM - RM for Microsoft SQL Server continues to collect the records.

Log information (examples):

Common message log file jpclog *(the message is output only when RM starts)*:

```
2009/10/25 18:22:25 jpcagtq  00002140 00002124 PWBSqlCollector 4241
     KAVL19400-W An attempt to connect to the SQL Server has failed.
```

Agent log file agtqerr01.log *(the message is output every time a record is collected)*

```
2009/10/25 18:24:23 jpcagtq  00002140 00002124 Sqlservado.cpp  0267
     E Error Code = 0x80004005, Error Description = [DBNETLIB]
     [ConnectionOpen (Connect()).]SQL Server does not exist or access is
denied
```

3.7.3 Timeout

- When you operate PFM - RM for Microsoft SQL Server in a cluster configuration and a failover occurs, PFM - RM for Microsoft SQL Server stops after its record collection is completed. Thus, it may take time to stop PFM - RM for Microsoft SQL Server. In this case, change the following instance information and adjust the query timeout value when accessing the databases.
  - TIMEOUT
- For details about how to change the instance information, see *2.1.4(2) Setting up an instance environment*.
- When you operate PFM - RM for Microsoft SQL Server in a cluster configuration and a failover occurs, PFM - RM for Microsoft SQL Server tries to reconnect to the Microsoft SQL Server host. Thus, it may take time to stop the PFM - RM for Microsoft SQL Server processes. In this case, change the following instance information and adjust the connection timeout value.
  - LOGIN_TIMEOUT

  For details about how to change the instance information, see *2.1.4(2) Setting up an instance environment*.

4 Monitoring Template

This chapter describes the monitoring template for PFM - RM for Microsoft SQL Server.

Overview of the monitoring template

The Performance Management products enable you to define alarms and reports with the following methods:

- Using alarms and reports defined by PFM - RM for Microsoft SQL Server without change.
- Copying and customizing the alarms and reports defined by PFM - RM for Microsoft SQL Server.
- Using the wizard to define new reports.

Alarms and reports provided by a PFM - RM for Microsoft SQL Server constitute a *monitoring template*. Because all required information is already defined for the alarms and reports in a monitoring template, you can use them as provided, or customize them as appropriate for your environment. This enables you to complete the preparations for monitoring the operating status of a desired program without having to use the wizard to define new reports.

This chapter describes the alarm and report settings in the monitoring template that are defined by PFM - RM for Microsoft SQL Server.

For details about using the monitoring template, see the chapter on creating reports used for operation analysis or the chapter on alarm-based operation monitoring in the *Job Management Partner 1/Performance Management User's Guide*.

Note:

The threshold specified for the alarms in the monitoring template is a reference example. When you use an alarm in the monitoring template, copy it and set an appropriate threshold according to the environment and the OS.

Format of alarm explanations

This section shows the format used to explain alarms. The manual lists the alarms in alphabetical order.

Alarm name

Indicates the name of an alarm in the monitoring template.

Overview

Provides an overview of the target that can be monitored by the alarm.

Main settings

Shows the main settings of the alarm in a table. The alarm settings in the table correspond to the settings in the Properties window that appears when you click an alarm icon on the **Alarms** window of PFM - Web Console and then click the **Properties** method. For details about each alarm setting, see the Properties window for the particular alarm in PFM - Web Console.

Hyphens (--) in the *Setting* column of the table indicate that any value set for the item will be invalid.

If an error condition is the same as a warning condition in a conditional expression, only the alarm event for the error is issued.

Related reports

Shows the monitoring template reports related to the alarm. You can view the reports by clicking an agent icon on the **Agents** window of PFM - Web Console, and then clicking the  icon for the **Display Alarm Status** method.

List of alarms

The alarms defined in a PFM - RM for Microsoft SQL Server monitoring template are summarized in an alarm table called `PFM RM SQL Template Alarms 09.00`. Here, `09.00` indicates an alarm table version. This alarm table is stored in the `RM SQLServer` folder that is displayed on the **Alarms** window of PFM - Web Console. The following table describes the alarms defined in the monitoring template.

Table 4-1: List of alarms (monitoring template)

Alarm name	What is monitored
Blocked Sessions	Number of sessions that are waiting for lock releases by other sessions.
Cache Usage	Rate at which the desired data was found inside the data cache instead of being read from a disk
CPU Usage	Top 10 sessions that are currently using the largest numbers of CPU cycles
Database Space	Space usage in each database in Microsoft SQL Server
Log Space Usage	Top 10 databases that are consuming the largest amounts of log space
Network Error	Impact of Microsoft SQL Server on network
Server Status	Availability of the Microsoft SQL Server instance

Note

When PFM - RM for Microsoft SQL Server does not connect to the monitoring target Microsoft SQL Server, PFM - RM for Microsoft SQL Server does not detect any alarms except Server Status.

Blocked Sessions

Overview

The Blocked Sessions alarm monitors the number of sessions on the Microsoft SQL Server that are waiting for lock releases by other sessions.

Main settings

Alarm properties in PFM - Web Console		Setting
Item	Detailed item	
Main	**Product**	`RM SQLServer`
	Message text	`%CVS session(s) are blocked`
	Enable alarm	Selected
	Evaluate all data	Not selected
	Monitoring time range	Always
	Alarm when damping conditions are satisfied	Not selected
	Interval	--
	Maximum occurrences	--
Actions	**E-mail**	--
	Command	--
	SNMP	**Abnormal**, **Warning**, **Normal**
Conditional Expressions	**Record**	Server Detail (`PD`)
	Field	`Blocked Processes`
	Abnormal condition	`Blocked Processes > 2`
	Warning condition	`Blocked Processes > 0`

Legend:

--: The setting is always invalid.

Related report

`Reports/RM SQLServer/Troubleshooting/Real-Time/Blocking Locks`

Cache Usage

Overview

The Cache Usage alarm monitors the rate at which the desired data was found inside the data cache and did not need to be read from a disk.

Main settings

Alarm properties in PFM - Web Console		Setting
Item	Detailed item	
Main	**Product**	`RM SQLServer`
	Message text	`Cache hit %CVS%`
	Enable alarm	Selected
	Evaluate all data	Not selected
	Monitoring time range	Always
	Alarm when damping conditions are satisfied	Not selected
	Interval	--
	Maximum occurrences	--
Actions	**E-mail**	--
	Command	--
	SNMP	**Abnormal**, **Warning**, **Normal**
Conditional Expressions	**Record**	Server Overview (`PI_SERV`)
	Field	`Cache Hit %`
	Abnormal condition	`Cache Hit % < 85`
	Warning condition	`Cache Hit % < 95`

Legend:

--: The setting is always invalid.

Related report

`Reports/RM SQLServer/Troubleshooting/Recent Past/Cache Usage`

CPU Usage

Overview

The CPU Usage alarm monitors the top 10 sessions that are currently using the largest numbers of CPU cycles.

Main settings

Alarm properties in PFM - Web Console		Setting
Item	Detailed item	
Main	**Product**	`RM SQLServer`
	Message text	`CPU busy %CVS%`
	Enable alarm	Selected
	Evaluate all data	Not selected
	Monitoring time range	Always
	Alarm when damping conditions are satisfied	Not selected
	Interval	--
	Maximum occurrences	--
Actions	**E-mail**	--
	Command	--
	SNMP	**Abnormal**, **Warning**, **Normal**
Conditional Expressions	**Record**	Global Server Summary (`PI`)
	Field	`CPU %`
	Abnormal condition	`CPU % > 90`
	Warning condition	`CPU % > 80`

Legend:

--: The setting is always invalid.

Related report

`Reports/RM SQLServer/Troubleshooting/Real-Time/CPU Usage - Top 10 Sessions`

Database Space

Overview

The Database Space alarm monitors the space usage in each database in Microsoft SQL Server.

Main settings

Alarm properties in PFM - Web Console		Setting
Item	Detailed item	
Main	**Product**	`RM SQLServer`
	Message text	`Database %CVS% free`
	Enable alarm	Selected
	Evaluate all data	Not selected
	Monitoring time range	Always
	Alarm when damping conditions are satisfied	Not selected
	Interval	--
	Maximum occurrences	--
Actions	**E-mail**	--
	Command	--
	SNMP	**Abnormal**, **Warning**, **Normal**
Conditional Expressions	**Record**	Database Space Detail (`PD_DS`)
	Field	`Free %`
	Abnormal condition	`Free % < 10`
	Warning condition	`Free % < 20`

Legend:

--: The setting is always invalid.

Related report

`Reports/RM SQLServer/Status Reporting/Real-Time/Database Space Usage`

Log Space Usage

Overview

The Log Space Usage alarm monitors the top 10 databases that are consuming the largest amounts of log space.

Main settings

Alarm properties in PFM - Web Console		Setting
Item	Detailed item	
Main	**Product**	`RM SQLServer`
	Message text	`Log %CVS% used`
	Enable alarm	Selected
	Evaluate all data	Not selected
	Monitoring time range	Always
	Alarm when damping conditions are satisfied	Not selected
	Interval	--
	Maximum occurrences	--
Actions	**E-mail**	--
	Command	--
	SNMP	**Abnormal**, **Warning**, **Normal**
Conditional Expressions	**Record**	Transaction Log Overview (`PI_TLOG`)
	Field	`Log Space Used %`
	Abnormal condition	`Log Space Used % > 90`
	Warning condition	`Log Space Used % > 80`

Legend:

--: The setting is always invalid.

Related report

`Reports/RM SQLServer/Troubleshooting/Real-Time/Log Space Usage - Top 10 Databases`

Network Error

Overview

The Network Error alarm monitors the impact of Microsoft SQL Server on the network.

Main settings

Alarm properties in PFM - Web Console		Setting
Item	Detailed item	
Main	**Product**	`RM SQLServer`
	Message text	`%CVS network errors detected`
	Enable alarm	Selected
	Evaluate all data	Not selected
	Monitoring time range	Always
	Alarm when damping conditions are satisfied	Not selected
	Interval	--
	Maximum occurrences	--
Actions	**E-mail**	--
	Command	--
	SNMP	**Abnormal**, **Warning**, **Normal**
Conditional Expressions	**Record**	Global Server Summary (`PI`)
	Field	`Pkt Errors`
	Abnormal condition	`Pkt Errors > 2`
	Warning condition	`Pkt Errors > 0`

Legend:

--: The setting is always invalid.

Related report

`Reports/RM SQLServer/Troubleshooting/Recent Past/Network Activity`

Server Status

Overview

The Server Status alarm monitors the availability of the Microsoft SQL Server instance.

Main settings

Alarm properties in PFM - Web Console		Setting
Item	Detailed item	
Main	**Product**	`RM SQLServer`
	Message text	`Database server availability = %CVS`
	Enable alarm	Selected
	Evaluate all data	Not selected
	Monitoring time range	Always
	Alarm when damping conditions are satisfied	Not selected
	Interval	--
	Maximum occurrences	--
Actions	**E-mail**	--
	Command	--
	SNMP	**Abnormal**, **Warning**, **Normal**
Conditional Expressions	**Record**	Instance Availability (`PD_IA`)
	Field	`Availability`
	Abnormal condition	`Availability = 0`
	Warning condition	`Availability = 0`

Legend:

--: The setting is always invalid.

Related report

`Reports/RM SQLServer/Status Reporting/Real-Time/System Overview`

Format of report explanations

This section describes the format used to explain reports. This manual lists the reports in alphabetical order.

Report name

Indicates the name of a report in the monitoring template.

A report whose name contains (`Multi-Agent`) presents information about multiple instances.

A report whose name does not contain (`Multi-Agent`) presents information about a single instance.

Overview

Provides an overview of the information that can be displayed in the report.

Storage location

Indicates the storage location of the report.

Record

Indicates the record that contains the performance data used in the report. To display a historical report, you must specify information in advance in order to collect the record indicated in this column. Before displaying a report, display the agent properties in the Agents window of PFM - Web Console, and make sure that `Log = Yes` is set for this record. This setting is not needed to display a real-time report.

Fields

Provides a table that describes the fields used in the report.

Drilldown reports (report level)

Provides a table that lists other reports in the monitoring template that are related to this report. To display these drilldown reports, in the PFM - Web Console report window, select the name of a drilldown report from the **Drilldown report** drop-down list, and then click **Display Reports**. Note that some reports do not have any drilldown reports.

Drilldown reports (field level)

Provides a table that describes reports in the monitoring template that are associated with fields used in this report. To display this drilldown report, click the report graph displayed in the Report window of PFM - Web Console or the field name displayed on the bottom of the Report window. For a historical report, you can display the report in smaller time intervals by clicking the time displayed in blue inside the report. Note that some reports do not have any drilldown reports.

Organization of report folders

The following shows the organization of the report folders for PFM - RM for Microsoft SQL Server. Angle brackets enclose folder names.

```
<RM SQLServer>
 +-- <Status Reporting>
 |    +-- <Daily Trend>
 |    |    +-- Cache Usage Trend(Multi-Agent)
 |    |    +-- Network Activity Trend
 |    |    +-- Server CPU Trend
 |    |    +-- Server Space Trend(Multi-Agent)
 |    +-- <Real-Time>
 |         +-- Database Space Usage
 |         +-- Server Configuration Status
 |         +-- Server Space Usage
 |         +-- System Overview
 |         +-- <Drilldown Only>
 |                   +-- Database Space Usage Detail
 +-- <Monthly Trend>
 |    +-- Cache Usage Trend(Multi-Agent)
 |    +-- Network Activity Trend
 |    +-- Server CPU Trend
 |    +-- Server Space Trend(Multi-Agent)
 +-- <Troubleshooting>
      +-- <Real-Time>
      |    +-- Blocked Sessions
      |    +-- Blocking Locks
      |    +-- CPU Usage - Top 10 Sessions
      |    +-- Database Summary
      |    +-- Lock Overview
      |    +-- Lock Overview by Lock Type
      |    +-- Lock Usage - Top 10 Sessions
      |    +-- Log Space Usage - Top 10 Databases
      |    +-- Memory Usage - Top 10 Sessions
      |    +-- Physical I/O - Top 10 Sessions
      |    +-- Sessions
      |    +-- <Drilldown Only>
      |         +-- Database Detail
      |         +-- Lock Detail
      |         +-- Session Detail
      +-- <Recent Past>
           +-- Cache Usage
           +-- Log I/O Activity
           +-- Network Activity
           +-- Pending I/O
           +-- Physical Write Activity
```

The following describes each folder:

- `Status Reporting` folder

  This folder contains reports for displaying daily information. Use this folder to check the overall status of the system. You can also display real-time reports in addition to historical reports.

  - `Daily Trend` folder

    This folder contains reports for displaying hourly information for the past 24 hours. Use the reports in this folder to check the daily status of the system.

  - `Real-Time` folder

    This folder contains real-time reports for checking the system status.

- `Monthly Trend` folder

  This folder contains reports that display daily information for the past month. Use the reports in this folder to check monthly trends in the system.

- `Troubleshooting` folder

  This folder contains reports for displaying information that is useful for resolving problems. In the event of a system problem, use the reports in this folder to check the cause of the problem.

  - `Real-Time` folder

This folder contains real-time reports for checking the current system status.

- `Recent Past` folder

  This folder contains historical reports for displaying minute-by-minute information for the past hour.

Additionally, these folders may contain the following folder under them:

- `Drilldown Only` folder

  This folder contains reports that can be displayed as drilldown reports (field level). Use the reports in this folder to display the detailed information related to the fields of the report.

List of reports

The following table lists the reports defined in the monitoring template in alphabetical order.

Table 4-2: TableList of reports

Report name	Displayed information	Storage location
Blocked Sessions	Information related to sessions that are waiting for lock release by other sessions	Reports/RM SQLServer/Troubleshooting/Real-Time/
Blocking Locks	Information related to sessions that have locks that are blocking other sessions	Reports/RM SQLServer/Troubleshooting/Real-Time/
Cache Usage	Cache statistics information for I/O buffers on a minute-by-minute basis over the past hour	Reports/RM SQLServer/Troubleshooting/Recent Past/
Cache Usage Trend(Multi-Agent) (historical report past 24 hours)	Cache statistics information for I/O buffers on an hour-by-hour basis over the past 24 hours	Reports/RM SQLServer/Status Reporting/Daily Trend/
Cache Usage Trend(Multi-Agent) (historical report past month)	Cache statistics information for I/O buffers on a day-by-day basis over the past month	Reports/RM SQLServer/Monthly Trend/
CPU Usage - Top 10 Sessions	Information related to the top 10 sessions that are currently using the largest numbers of CPU cycles	Reports/RM SQLServer/Troubleshooting/Real-Time/
Database Detail	Detailed information related to a particular database in Microsoft SQL Server	Reports/RM SQLServer/Troubleshooting/Real-Time/Drilldown Only/
Database Space Usage	Information related to space usage in each database in Microsoft SQL Server	Reports/RM SQLServer/Status Reporting/Real-Time/
Database Space Usage Detail	Detailed information related to space usage in each database in Microsoft SQL Server	Reports/RM SQLServer/Status Reporting/Real-Time/Drilldown Only/
Database Summary	Detailed information related to the statuses of all databases in Microsoft SQL Server	Reports/RM SQLServer/Troubleshooting/Real-Time/
Lock Detail	Detailed information related to each lock	Reports/SQL/Troubleshooting/Real-Time/Drilldown Only/
Lock Overview	Overview of locks in the entire instance (total number of database locks being maintained)	Reports/SQL/Troubleshooting/Real-Time/
Lock Overview by Lock Type	Overview of locks in the entire instance (total numbers of database locks being maintained by lock type)	Reports/RM SQLServer/Troubleshooting/Real-Time/
Lock Usage - Top 10 Sessions	Information related to the top 10 sessions that currently have the largest numbers of locks on database objects	Reports/RM SQLServer/Troubleshooting/Real-Time/
Log I/O Activity	Statistics information related to log entries by server on a minute-by-minute basis over the past hour	Reports/RM SQLServer/Troubleshooting/Recent Past/
Log Space Usage - Top 10 Databases	Information related to the top 10 databases that are currently consuming the largest amounts of log space	Reports/RM SQLServer/Troubleshooting/Real-Time/

Report name	Displayed information	Storage location
Memory Usage - Top 10 Sessions	Information related to the top 10 sessions that are currently using the largest amounts of memory	Reports/RM SQLServer/Troubleshooting/Real-Time/
Network Activity	Statistics information related to network activities on a minute-by-minute basis over the past hour	Reports/RM SQLServer/Troubleshooting/ Recent Past/
Network Activity Trend(historical report past 24 hours)	Statistics information related to network activities on an hour-by hour basis over the past 24 hours	Reports/RM SQLServer/Status Reporting/ Daily Trend/
Network Activity Trend(historical report past month)	Statistics information related to network activities on a day-by-day basis over the past month	Reports/RM SQLServer/Monthly Trend/
Pending I/O	This report is reserved and cannot be used.	Reports/RM SQLServer/Troubleshooting/ Recent Past/
Physical I/O - Top 10 Sessions	Information related to the top 10 sessions that are currently executing the largest number of disk read/write operations	Reports/RM SQLServer/Troubleshooting/Real-Time/
Physical Write Activity	Statistics information related to write activities on a minute-by-minute basis over the past hour	Reports/RM SQLServer/Troubleshooting/ Recent Past/
Server Configuration Status	Information related to environment setting parameter values for Microsoft SQL Server	Reports/RM SQLServer/Status Reporting/ Real-Time/
Server CPU Trend(historical report past 24 hours)	Statistics information on CPU usage on an hour-by-hour basis over the past 24 hours	Reports/RM SQLServer/Status Reporting/ Daily Trend/
Server CPU Trend(historical report past month)	Statistics information on CPU usage on a day-by-day basis over the past month	Reports/RM SQLServer/Monthly Trend/
Server Space Trend(Multi-Agent) (historical report past 24 hours)	Statistics information on available space on an hour-by-hour basis over the past 24 hours	Reports/RM SQLServer/Status Reporting/ Daily Trend/
Server Space Trend(Multi-Agent) (historical report past month)	Statistics information on available space on a day-by-day basis over the past month	Reports/RM SQLServer/Monthly Trend/
Server Space Usage	Statistics information related to the overall space usage in Microsoft SQL Server	Reports/RM SQLServer/Status Reporting/ Real-Time/
Session Detail	Detailed information related to resource usage in each session	Reports/RM SQLServer/Troubleshooting/Real-Time/Drilldown Only/
Sessions	Information related to the statuses of all processes connected to Microsoft SQL Server	Reports/RM SQLServer/Troubleshooting/Real-Time/
System Overview	Detailed information related to Microsoft SQL Server	Reports/RM SQLServer/Status Reporting/ Real-Time/

Blocked Sessions

Overview

The Blocked Sessions report displays the information related to sessions that are waiting for lock release by other sessions. This report is displayed as a table. From the displayed report, you can display more detailed drilldown reports.

Note that the performance of a session that repeatedly waits for lock release declines.

Storage location

Reports/RM SQLServer/Troubleshooting/Real-Time/

Record

Lock Detail (PD_LD)

Fields

Field name	Description
Blocking Flag	This flag indicates whether or not the lock is a blocking lock. The following values are valid: 1 Blocking lock 0 Not a blocking lock
DB Name	Database name related to lock resource
Demand Flag	This flag indicates whether or not the lock is a request lock. The following values are valid: 1 Request lock 0 Not a request lock
Lock Type	Lock type (lock request mode and lock resource type)
Orphan Flag	This flag indicates whether or not the lock is an isolated lock. The following values are valid: 1 Isolated lock 0 Not an isolated lock
Program	Name of the application program that is requesting the lock
SPID	Process ID that is requesting the lock
Table	Table name if the lock resource is a table or row
User	Logon name of the user who issued the command

Drilldown reports (field level)

Report name	Description
Lock Detail	Displays detailed information related to each lock. To display this report, click the Lock Type field.
Session Detail	Displays detailed information related to resource usage status in each session. To display this report, click the SPID field.

Blocking Locks

Overview

The `Blocking Locks` report displays information related to sessions that have locks that are blocking other sessions. This report is displayed as a table. From the displayed report, you can display more detailed drilldown reports.

Storage location

`Reports/RM SQLServer/Troubleshooting/Real-Time/`

Record

Lock Detail (`PD_LD`)

Fields

Field name	Description

Blocking Flag	This flag indicates whether or not the lock is a blocking lock. The following values are valid:
	`1`
	Blocking lock
	`0`
	Not a blocking lock

DB Name	Database name related to lock resource

Demand Flag	This flag indicates whether or not the lock is a request lock. The following values are valid:
	`1`
	Request lock
	`0`
	Not a request lock

Lock Type	Lock type (lock request mode and lock resource type)

Orphan Flag	This flag indicates whether or not the lock is an isolated lock. The following values are valid:
	`1`
	Isolated lock
	`0`
	Not an isolated lock

Program	Name of the application program that is requesting the lock
SPID	Process ID that is requesting the lock
Table	Table name if the lock resource is a table or row
User	Logon name of the user who issued the command

Drilldown reports (field level)

Report name	Description
Lock Detail	Displays detailed information related to each lock. To display this report, click the Lock Type field.
Session Detail	Displays detailed information related to resource usage status in each session. To display this report, click the SPID field.

Cache Usage

Overview

The Cache Usage report displays cache statistics information for I/O buffers on a minute-by-minute basis over the past hour. The information is displayed as a line graph. From the displayed report, you can display more detailed drilldown reports.

Storage location

Reports/RM SQLServer/Troubleshooting/Recent Past/

Record

Server Overview (PI_SERV)

Field

Field name	Description
Cache Hit %	Rate at which data pages were found inside the data cache

Drilldown reports (report level)

Report name	Description
Physical I/O - Top 10 Sessions	Displays information related to the top 10 sessions that are currently executing the largest number of disk read/write operations

Cache Usage Trend(Multi-Agent) (historical report past 24 hours)

Overview

The Cache Usage Status(Multi-Agent) report displays cache statistics information for I/O buffers on an hour-by-hour basis over the past 24 hours. The information is displayed as a line graph. You can display this report for multiple instances of Microsoft SQL Server.

Storage location

Reports/RM SQLServer/Status Reporting/Daily Trend/

Record

Server Overview (PI_SERV)

Field

Field name	Description
Cache Hit %	Rate at which data pages were found inside the data cache

Cache Usage Trend(Multi-Agent) (historical report past month)

Overview

The Cache Usage Trend(Multi-Agent) report displays cache statistics information for I/O buffers on a day-by-day basis over the past month. The information is displayed as a line graph. You can display this report for multiple instances of Microsoft SQL Server.

Storage location

Reports/RM SQLServer/Monthly Trend/

Record

Server Overview (PI_SERV)

Field

Field name	Description
Cache Hit %	Rate at which data pages were found inside the data cache

CPU Usage - Top 10 Sessions

Overview

The CPU Usage - Top 10 Sessions report displays information related to the top 10 sessions that are currently using the largest numbers of CPU cycles. This report is displayed as a bar graph. From the displayed report, you can display more detailed drilldown reports.

Storage location

Reports/RM SQLServer/Troubleshooting/Real-Time/

Record

Process Detail (PD_PDET)

Fields

Field name	Description
Command	Name of the command being executed
CPU %	CPU time being used by the process as a percentage of the CPU time being used by all database processes
Physical I/O	Cumulative number of times the process executed read/write operations to disks
Program	Application program name
SPID	Process ID
User	Logon name of the user who issued the command

Drilldown reports (field level)

Report name	Description
Session Detail	Displays detailed information related to resource usage by each session. To display this report, click the CPU % field.

Database Detail

Overview

The `Database Detail` report displays detailed information related to a particular database on Microsoft SQL Server. This report is displayed as a list. This is a drilldown report.

Storage location

`Reports/RM SQLServer/Troubleshooting/Real-Time/Drilldown Only/`

Record

Database Detail (`PD_DD`)

Fields

Field name	Description

Availability	Database status. The following values are valid:
	`Active`
	Enabled. Process is running.
	`Available`
	Enabled. No process is running.
	`NOT Available`
	A crash or problem may have occurred during loading, and as a result the database cannot be opened or used in its current state.
	`Restricted`
	Database can be used only by its owner or a single user.

Blocked Processes	Number of blocked processes
Blocking Locks	Number of blocking locks
Create Date	Database creation date
DB Name	Database name
DB Owner	Database owner
DBID	Database ID
Demand Locks	Number of request locks
Exclusive Intent Locks	Number of exclusive intent locks
Exclusive Page Locks	Number of exclusive page locks
Exclusive Table Locks	Number of exclusive table locks
Last Dump Date	Last dump date for the transaction log
Locks	Total number of locks
Options	Database option
Other Processes	Number of other types of processes
Process Count	Total number of processes
Runnable Processes	Number of executable processes
Running Processes	Number of processes being executed

Field name	Description
Shared Intent Locks	Number of shared intent locks
Shared Page Locks	Number of shared page locks
Shared Table Locks	Number of shared table locks
Sleeping Processes	Number of sleeping processes
Update Page Locks	Number of update page locks
Version	Microsoft SQL Server version used for database creation

Database Space Usage

Overview

The Database Space Usage report displays information related to space usage in each database in Microsoft SQL Server. This report is displayed as a pie graph. From the displayed report, you can display more detailed drilldown reports.

Storage location

Reports/RM SQLServer/Status Reporting/Real-Time/

Record

Database Space Detail (PD_DS)

Fields

Field name	Description
Data Mbytes	Size of database being used (megabytes)
DBID	Database ID
Free Mbytes	Size of free space (megabytes)
Index Mbytes	Size of index space being used (megabytes)
Unused Mbytes	Size of allocated but unused space (megabytes)

Drilldown reports (report level)

Report name	Description
Database Space Usage Detail	Displays detailed information related to space usage in each database.

Drilldown reports (field level)

Report name	Description
Database Space Usage Detail	Displays detailed information related to space usage in each database. To display this report, click the following fields: • Data Mbytes • Free Mbytes • Index Mbytes • Unused Mbytes

Database Space Usage Detail

Overview

The Database Space Usage Detail report displays detailed information related to space usage in each database. This report is displayed as a list. This is a drilldown report.

Storage location

Reports/RM SQLServer/Status Reporting/Real-Time/Drilldown Only/

Record

Database Space Detail (PD_DS)

Fields

Field name	Description
Data Mbytes	Size of database being used (megabytes)
DB Name	Database name
DB Size	Database size in megabytes
DBID	Database ID
Free Mbytes	Size of free space (megabytes)
Index Mbytes	Size of index space being used (megabytes)
Log Mbytes	Size of log space being used (megabytes)
Rsvd Mbytes	Size of allocated space (megabytes)
Unused Mbytes	Size of allocated but unused space (megabytes)

Database Summary

Overview

The Database Summary report displays detailed information related to the statuses of all databases in Microsoft SQL Server. This report is displayed as a table. From the displayed report, you can display more detailed drilldown reports.

Storage location

Reports/RM SQLServer/Troubleshooting/Real-Time/

Record

Database Detail (PD_DD)

Fields

Field name	Description
Availability	Database status. The following values are valid: Active Enabled. Process is running. Available Enabled. No process is running. NOT Available A crash or problem may have occurred during loading, and as a result the database cannot be opened or used in its current state. Restricted Database can be used only by its owner or a single user.
Blocked Processes	Number of blocked processes
Blocking Locks	Number of blocking locks
Create Date	Database creation date
DB Name	Database name
DB Owner	Database owner
DBID	Database ID
Last Dump Date	Last dump date for the transaction log
Locks	Total number of locks
Process Count	Total number of processes
Version	Microsoft SQL Server version used for database creation

Drilldown reports (field level)

Report name	Description
Blocked Sessions	Displays the information related to sessions that are waiting for lock release by other sessions. To display this report, click the Blocked Processes field.
Blocking Locks	Displays information related to sessions that have locks that are blocking other sessions. To display this report, click the Blocking Locks field.

Report name	Description
Database Detail	Displays detailed information related to a particular database on Microsoft SQL Server. To display this report, click the DB Name field.
Sessions	Displays information related to the statuses of all processes connected to Microsoft SQL Server. To display this report, click the Process Count field.

Lock Detail

Overview

The Lock Detail report displays detailed information related to each lock. This report is displayed as a list. It is a drilldown report. From the displayed drilldown report, you can display more detailed drilldown reports.

Storage location

Reports/RM SQLServer/Troubleshooting/Real-Time/Drilldown Only/

Record

Lock Detail (PD_LD)

Fields

Field name	Description
Blocking Flag	This flag indicates whether or not the lock is a blocking lock. The following values are valid: 1 Blocking lock 0 Not a blocking lock
DB Name	Database name related to lock resource
DBID	Database ID related to lock resource
Demand Flag	This flag indicates whether or not the lock is a request lock. The following values are valid: 1 Request lock 0 Not a request lock
Lock Type	Lock type (lock request mode and lock resource type)
Orphan Flag	This flag indicates whether or not the lock is an isolated lock. The following values are valid: 1 Isolated lock 0 Not an isolated lock
Page #	Number of pages allocated to lock resource
Program	Name of the application program that is requesting the lock
SPID	Process ID that is requesting the lock
Table	Table name if the lock resource is a table or row
User	Logon name of the user who issued the command

Drilldown reports (field level)

Report name	Description
Session Detail	Displays detailed information related to resource usage in each session. To display this report, click the SPID field.

Lock Overview

Overview

The Lock Overview report displays the overview of locks in the entire instance as the total number of database locks being maintained. This report is displayed as a list. From the displayed report, you can display more detailed drilldown reports.

Storage location

Reports/RM SQLServer/Troubleshooting/Real-Time/

Record

Server Locks Detail (PD_LOCK)

Fields

Field name	Description
Total Blocking Locks	Number of locks that are blocking other processes
Total Exclusive Locks	Total number of exclusive locks
Total Extent Locks	Total number of extent locks
Total Intent Locks	Total number of intent locks
Total Locks	Total number of locks being used by Microsoft SQL Server
Total Page Locks	Total number of page locks
Total Shared Locks	Total number of shared locks
Total Table Locks	Total number of table locks
Users Blocked	Number of users who are blocked by other users

Drilldown reports (report level)

Report name	Description
Lock Overview by Lock Type	Displays the overview of locks in the entire instance as the total numbers of database locks being maintained by lock type.

Drilldown reports (field level)

Report name	Description
Blocked Sessions	Displays the information related to sessions that are waiting for lock release by other sessions. To display this report, click the Users Blocked field.
Blocking Locks	Displays information related to sessions that have locks that are blocking other sessions. To display this report, click the Total Blocking Locks field.

Lock Overview by Lock Type

Overview

The Lock Overview by Lock Type report displays the overview of locks in the entire instance as the total number of database locks being maintained by lock type.This report is displayed as a list.

Storage location

Reports/RM SQLServer/Troubleshooting/Real-Time/

Record

Server Locks Detail (PD_LOCK)

Fields

Field name	Description
Exclusive Extent Locks	Number of exclusive extent locks
Exclusive Intent Locks	Number of exclusive intent locks
Exclusive Page Locks	Number of exclusive page locks
Exclusive Table Locks	Number of exclusive table locks
Shared Intent Locks	Number of shared intent locks
Shared Page Locks	Number of shared page locks
Shared Table Locks	Number of shared table locks
Update Extent Locks	Number of update extent locks
Update Page Locks	Number of update page locks

Lock Usage - Top 10 Sessions

Overview

The Lock Usage - Top 10 Sessions report displays information related to the top 10 sessions that currently have the largest numbers of locks on database objects. This report is displayed as a bar graph. From the displayed report, you can display more detailed drilldown reports.

Storage location

Reports/RM SQLServer/Troubleshooting/Real-Time/

Record

Process Detail (PD_PDET)

Fields

Field name	Description
Blocked Processes	Number of processes blocked by the process
DB Name	Name of the database being used by the process at the time of record acquisition
Locks	Number of locks being requested by the process at the time of record acquisition
Program	Application program name
SPID	Process ID
User	Logon name of the user who issued the command

Drilldown reports (field level)

Report name	Description
Session Detail	Displays detailed information related to resource usage in each session. To display this report, click the Locks field.

Log I/O Activity

Overview

The Log I/O Activity report displays statistics information related to log entries by server on a minute-by-minute basis over the past hour. The information is displayed as a line graph.

Storage location

Reports/RM SQLServer/Troubleshooting/Recent Past/

Record

Server Overview (PI_SERV)

Field

Field name	Description
Log Writes/sec	Total number of log pages physically written onto a disk

Log Space Usage - Top 10 Databases

Overview

The Log Space Usage - Top 10 Databases report displays information related to the top 10 databases that are currently consuming the largest amounts of log space. This report is displayed as a bar graph.

Storage location

Reports/RM SQLServer/Troubleshooting/Real-Time/

Record

Transaction Log Overview (PI_TLOG)

Fields

Field name	Description
DB Name	Database name
Log Size Mbytes	Size of space allocated to transaction log (megabytes)

Memory Usage - Top 10 Sessions

Overview

The Memory Usage - Top 10 Sessions report displays information related to the top 10 sessions that are currently using the largest amounts of memory. This report is displayed as a bar graph. From the displayed report, you can display more detailed drilldown reports.

Storage location

Reports/RM SQLServer/Troubleshooting/Real-Time/

Record

Process Detail (PD_PDET)

Fields

Field name	Description
Mem Usage	Number of procedure cache pages allocated to the process (1 page equals 8 kilobytes)
Program	Application program name

Drilldown reports (field level)

Report name	Description
Session Detail	Displays detailed information related to resource usage in each session. To display this report, click the Mem Usage field.

Network Activity

Overview

The `Network Activity` report displays statistics information related to network activities on a minute-by-minute basis over the past hour. The information is displayed as a line graph.

Storage location

`Reports/RM SQLServer/Troubleshooting/Recent Past/`

Record

Global Server Summary (`PI`)

Fields

Field name	Description
Pkt Errors	Number of packet errors
Pkts Rcvd	Number of packets received
Pkts Sent	Number of packets sent

Network Activity Trend (historical report past 24 hours)

Overview

The `Network Activity Trend` report displays statistics information related to network activities on an hour-by hour basis over the past 24 hours. The information is displayed as a line graph.

Storage location

`Reports/RM SQLServer/Status Reporting/Daily Trend/`

Record

Global Server Summary (`PI`)

Fields

Field name	Description
Pkt Errors	Number of packet errors
Pkts Rcvd	Number of packets received
Pkts Sent	Number of packets sent

Network Activity Trend (historical report past month)

Overview

The Network Activity Trend report displays statistics information related to network activities on a day-by-day basis over the past month. The information is displayed as a line graph.

Storage location

Reports/RM SQLServer/Monthly Trend/

Record

Global Server Summary (PI)

Fields

Field name	Description
Pkt Errors	Number of packet errors
Pkts Rcvd	Number of packets received
Pkts Sent	Number of packets sent

Pending I/O

Overview

The `Pending I/O` report is reserved and cannot be used.

Storage location

`Reports/RM SQLServer/Troubleshooting/Recent Past/`

Physical I/O - Top 10 Sessions

Overview

The Physical I/O - Top 10 Sessions report displays information related to the top 10 sessions that are currently executing the largest number of disk read/write operations. This report is displayed as a bar graph. From the displayed report, you can display more detailed drilldown reports.

Storage location

Reports/RM SQLServer/Troubleshooting/Real-Time/

Record

Process Detail (PD_PDET)

Fields

Field name	Description
Physical I/O	Cumulative number of times the process executed read/write operations to disks
Program	Application program name

Drilldown reports (field level)

Report name	Description
Session Detail	Displays detailed information related to resource usage by each session. To display this report, click the Physical I/O field.

Physical Write Activity

Overview

The Physical Write Activity report displays statistics information related to write activities on a minute-by-minute basis over the past hour. The information is displayed as a line graph.

You can use this report to check the statistics on physical writing and delay writing operations.

Storage location

Reports/RM SQLServer/Troubleshooting/Recent Past/

Record

Server Overview (PI_SERV)

Fields

Field name	Description
Lazy Writes/sec	Total number of pages flushed by Lazy Writer to a disk (1 page equals 8 kilobytes)
Page Writes/sec	Total number of physical page write operations

Server Configuration Status

Overview

The Server Configuration Status report displays information related to environment setting parameter values for Microsoft SQL Server. This report is displayed as a table.

Storage location

Reports/RM SQLServer/Status Reporting/Real-Time/

Record

Config Detail (PD_CD)

Fields

Field name	Description
Config Value	Environment setting option value
Current Run Value	Environment setting option value (execution value during data collection)
Max Value	Maximum value of environment setting option
Min Value	Minimum value of environment setting option
Name	Name of environment setting option

Server CPU Trend (historical report past 24 hours)

Overview

The `Server CPU Status` report displays statistics information on CPU usage on an hour-by-hour basis over the past 24 hours. The information is displayed as a line graph.

Storage location

`Reports/RM SQLServer/Status Reporting/Daily Trend/`

Record

Global Server Summary (`PI`)

Fields

Field name	Description
CPU %	Percentage of time CPU is busy
I/O %	Percentage of CPU time spent for I/O
Idle %	Percentage of time CPU is idle

Server CPU Trend (historical report past month)

Overview

The `Server CPU Trend` report displays statistics information on CPU usage on a day-by-day basis over the past month. The information is displayed as a line graph.

Storage location

`Reports/RM SQLServer/Monthly Trend/`

Record

Global Server Summary (`PI`)

Fields

Field name	Description
CPU %	Percentage of time CPU is busy
I/O %	Percentage of CPU time spent for I/O
Idle %	Percentage of time CPU is idle

Server Space Trend(Multi-Agent) (historical report past 24 hours)

Overview

The Server Space Trend(Multi-Agent) report displays statistics information on available space on an hour-by-hour basis over the past 24 hours. The information is displayed as a line graph. You can display this report for multiple instances of Microsoft SQL Server.

Storage location

Reports/RM SQLServer/Status Reporting/Daily Trend/

Record

Server Space Interval (PI_SI)

Field

Field name	Description
Free %	Percentage of free space in the entire database area

Server Space Trend(Multi-Agent) (historical report past month)

Overview

The Server Space Trend(Multi-Agent) report displays statistics information on available space on a day-by-day basis over the past month. The information is displayed as a line graph. You can display this report for multiple instances of Microsoft SQL Server.

Storage location

Reports/RM SQLServer/Monthly Trend/

Record

Server Space Interval (PI_SI)

Field

Field name	Description
Free %	Percentage of free space in the entire database area

Server Space Usage

Overview

The Server Space Usage report displays statistics information related to the overall space usage in Microsoft SQL Server. This report is displayed as a pie graph and a list. From the displayed report, you can display more detailed drilldown reports.

Storage location

Reports/RM SQLServer/Status Reporting/Real-Time/

Record

Server Space Detail (PD_SS)

Fields

Field name	Description
Data Mbytes	Size of data space being used (megabytes)
DB Size	Size of the entire database (megabytes)
Free Mbytes	Size of free space (megabytes)
Index Mbytes	Size of index space being used (megabytes)
Log Mbytes	Size of log space being used (megabytes)
Rsvd Mbytes	Size of allocated space (megabytes)
Unused Mbytes	Size of allocated but unused space (megabytes)

Drilldown reports (report level)

Report name	Description
Database Space Usage	Displays information related to space usage in each database in Microsoft SQL Server.

Session Detail

Overview

The `Session Detail` report displays detailed information related to resource usage in each session. This report is displayed as a list. It is a drilldown report. From the displayed drilldown report, you can display more detailed drilldown reports.

Storage location

`Reports/RM SQLServer/Troubleshooting/Real-Time/Drilldown Only/`

Record

Process Detail (`PD_PDET`)

Fields

Field name	Description
Blocked Processes	Number of processes blocked by the process
Blocking Process	Process ID of a blocking process, if any
Command	Name of the command executed
CPU %	CPU time being used by the process, as a percentage of the CPU time being used by all database processes
DB Name	Name of the database being used by the process at the time of record acquisition
DBID	Database ID being used by the process at the time of record acquisition
GID	This field is reserved and cannot be used.
Host	Host computer name
Host PID	Host process ID
Locks	Number of locks being requested by the process at the time of record acquisition
Mem Usage	Number of procedure cache pages allocated to the process (1 page equals 8 kilobytes)
Physical I/O	Cumulative number of times the process executed read/write operations to disks
Program	Application program name
SPID	Process ID
Status	Process status
UID	User ID of the user who executed the command
User	Logon name of the user who issued the command

Drilldown reports (field level)

Report name	Description
`Blocked Sessions`	Displays the information related to sessions that are waiting for lock release by other sessions. To display this report, click the Blocked Processes field.

Report name	Description
Database Detail	Displays detailed information related to a particular database on Microsoft SQL Server. To display this report, click the DB Name field.
Lock Detail	Displays detailed information related to each lock. To display this report, click the Blocking Process field.

Sessions

Overview

The `Sessions` report displays information related to the statuses of all processes connected to Microsoft SQL Server. This report is displayed as a table. From the displayed report, you can display more detailed drilldown reports.

Storage location

`Reports/RM SQLServer/Troubleshooting/Real-Time/`

Record

Process Detail (`PD_PDET`)

Fields

Field name	Description
Blocked Processes	Number of processes blocked by the process
Blocking Process	Process ID of a blocking process, if any
DB Name	Name of the database being used by the process at the time of record acquisition
DBID	Database ID being used by the process at the time of record acquisition
Mem Usage	Number of procedure cache pages allocated to the process (1 page equals 8 kilobytes)
Program	Application program name
SPID	Process ID
User	Logon name of the user who issued the command

Drilldown reports (field level)

Report name	Description
`Database Detail`	Displays detailed information related to a particular database on Microsoft SQL Server. To display this report, click the DB Name field.
`Session Detail`	Displays detailed information related to resource usage by each session. To display this report, click one of the following fields: • Blocking Process • SPID

System Overview

Overview

The System Overview report displays detailed information related to Microsoft SQL Server. The information is displayed as a list and as a line graph. From the displayed report, you can display more detailed drilldown reports.

Storage location

Reports/RM SQLServer/Status Reporting/Real-Time/

Record

Server Detail (PD)

Fields

Field name	Description
Blocked Processes	Number of blocked processes
Blocking Locks	Number of blocking locks
Boot Time	Server boot date
Cache Hit %	Rate at which data pages were found inside the data cache during an interval
Conns	Number of client connections
CPU %	Percentage of time CPU is busy
Database Count	Number of databases
Host OS	OS that is running Microsoft SQL Server
Host Type	Type of machine on which Microsoft SQL Server is running. Either of the following values is displayed: • For the 32-bit and 64-bit (IPF) versions of Microsoft SQL Server: Intel • For the 64-bit version of Microsoft SQL Server (x64): X64
I/O %	Percentage of CPU time spent for I/O
Idle %	Percentage of time CPU is idle
Locks	Total number of locks
Pkt Errors	Number of packet errors
Pkts Rcvd	Number of packets received
Pkts Sent	Number of packets sent
Server Name	Name of the machine on which Microsoft SQL Server is running
Total Errors	Number of disk errors
Total Reads	Number of disk read operations
Total Writes	Number of disk write operations
Version	Microsoft SQL Server version

Drilldown reports (report level)

Report name	Description
Database Space Usage	Displays information related to space usage in each database in Microsoft SQL Server.
Lock Overview	Displays the overview of locks in the entire instance as a total number of database locks being maintained.
Log Space Usage - Top 10 Databases	Displays information related to the top 10 databases that are currently consuming the largest amounts of log space.
Server Configuration Status	Displays information related to environment setting parameter values for Microsoft SQL Server.
Server Space Usage	Displays statistics information related to the overall space usage in Microsoft SQL Server.

Drilldown reports (field level)

Report name	Description
Blocked Sessions	Displays the information related to sessions that are waiting for lock release by other sessions. To display this report, click the Blocked Processes field.
Blocking Locks	Displays information related to sessions that have locks that are blocking other sessions. To display this report, click the Blocking Locks field.
CPU Usage - Top 10 Sessions	Displays information related to the top 10 sessions that are currently using the largest numbers of CPU cycles. To display this report, click the CPU % field.
Database Summary	Displays detailed information related to the statuses of all databases in Microsoft SQL Server. To display this report, click the Database Count field.
Errorlog Overview	Displays the overview of all errors that occurred in Microsoft SQL Server in the last interval. To display this report, click the Total Errors field.
Lock Usage - Top 10 Sessions	Displays information related to the top 10 sessions that currently have the largest numbers of locks on database objects. To display this report, click the Locks field.
Memory Usage - Top 10 Sessions	Displays information related to the top 10 sessions that are currently using the largest amounts of memory. To display this report, click the Cache Hit % field.
Network Activity	Displays statistics information related to network activities on a minute-by-minute basis over the past hour. To display this report, click one of the following fields: • Pkt Errors • Pkts Rcvd • Pkts Sent
Physical I/O - Top 10 Sessions	Displays information related to the top 10 sessions that are currently executing the largest number of disk read/write operations. To display this report, click the I/O % field.

5 Records

This chapter describes the records for PFM - RM for Microsoft SQL Server. For details about collecting performance data for each type of record, see the chapter on Performance Management functionality in the *Job Management Partner 1/ Performance Management Planning and Configuration Guide* or the chapter on management of operation monitoring data in the *Job Management Partner 1/ Performance Management User's Guide*.

Data model

Each PFM - RM for Microsoft SQL Server records and fields are referred to collectively as a *data model*. There is a specific version number for each PFM - RM for Microsoft SQL Server and its data model.

For details about data model versions of PFM - RM for Microsoft SQL Server, see *H. Version Compatibility*.

To check the data model version of each PFM - RM for Microsoft SQL Server, use the Properties window in PFM - Web Console. To display the Properties window, click the agent icon on the **Agents** page in PFM - Web Console, and then click the **Properties** method.

For details about data models, see the chapter on Performance Management functionality in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

Format of record explanations

This chapter describes the records for PFM - RM for Microsoft SQL Server in alphabetical order. The explanation of each record consists of the following subsections:

Function

Provides an overview of the performance data that is stored in the record and includes important information that should be noted.

Default and changeable values

Consists of a table of the default values for the performance data under the collection conditions that are defined for the record, and indicates whether or not the values can be changed by the user. The table below lists and describes the items that appear in the Default and changeable values subsections. For details about each item in the table, see the chapter on management of operation monitoring data in the *Job Management Partner 1/Performance Management User's Guide*.

Table 5-1: Default and changeable values

Item	Default value	Changeable
Collection Interval	Performance data collection interval (in seconds)	`Y`: Changeable `N`: Not changeable
Collection Offset#1	Offset value for starting performance data collection (in seconds). For details about offset values, see the chapter on management of operation monitoring data in the *Job Management Partner 1/Performance Management User's Guide*. For collection start time for the performance data, see the chapter on the Performance Management functionality in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.	
Log#2	Whether or not collected performance data is stored in the Store database: `Yes`: Store (however, if `Collection Interval=0` is set, collected performance data is not stored). `No`: Do not store.	
LOGIF	Conditions for storing collected performance data in the Store database	

#1

The range of values is from 0 to 32,767 (inclusive) seconds (within the value range specified for Collection Interval). This is used to distribute the collection processing workload because data collection is concentrated when multiple data items are collected. The data collection time that is recorded is the same as for the Collection Interval regardless of the value of Collection Offset.

If you change the value of Collection Offset, you should take into account the collection processing workload.

#2

The default values for each record are for remote agents. In PFM - RM for Microsoft SQL Server, the default values for group agents are "No".

ODBC key fields

Indicates the ODBC key fields that are required in order to use the record data stored in the Store database by using SQL statements with PFM - Manager. Some ODBC key fields are common to all records, and some are specific to each record. This section presents the ODBC key fields that are specific to each record. Only the multi-instance records have specific ODBC key fields.

For details about the ODBC key fields common to all records, see *List of ODBC key fields* in this chapter. For details about using ODBC key fields, see the chapter on linking to an ODBC-compliant application program in the *Job Management Partner 1/Performance Management User's Guide*.

Lifetime

Indicates the period during which consistency is guaranteed for the performance data that is collected in the record. For details about lifetimes, see the chapter on Performance Management functionality in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

Record size

Indicates the amount of performance data that can be collected and stored in each record at one time.

Fields

Provides a table that describes the fields of each record. The table contains the following items:

- PFM - View name (PFM - Manager name)
  - PFM - View name

    Indicates the field name that is displayed with PFM - Web Console (PFM - View name).
  - PFM - Manager name

    Field name (PFM - Manager name) to be specified in SQL statements when SQL statements are used from PFM - Manager to access the field data stored in the Store database.

    You specify the record ID at the beginning of an SQL statement. For example, to specify the Disk Sorts (`SORTS_DISK`) field of the System Stat Summary (`PD`) record, specify `PD_SORTS_DISK`.
- Description

  Explanation of the performance data that is stored in the field.

  Notes #1 and #2 in the table indicate the following:

  #1

  A value in this field is the latest monitored value that the OS returns at the time of data collection.

  #2

  When this field is displayed in the historical report, the PFM - View name (Total) field is added.

  For each field, the following methods of calculating performance data are available:

  - Calculations (such as averages or percentages) based on data collected in the current and previous intervals.
  - Calculations based on data collected in the current interval only. This data includes the values accumulated internally by the OS (the data marked as #1 in the table).
  - Calculations based on data in other fields (See Data source in the table of each record's fields.)

  Unless otherwise noted, the value in each field is an unprocessed value that was collected at a specified data collection interval.

  The following types of values are displayed in a historical report when records of the PI record type are summarized and displayed while the report interval setting is not "minute":

  - The average value for the summarized interval
  - The last collected value
  - The sum total of values
  - The minimum value
  - The maximum value

  Unless otherwise noted, the value in each field displays the average for the summarized interval.
- Summary

  The summarization method (Summary rules) used by Remote Monitor Store when summarizing data. For details, see *Summary rules* in this chapter.
- Format

  Data type of the field value, such as `double`. For details about the data types, see *List of data types* in this chapter.
- Delta

In contrast to the data collected as the cumulative value, the so-called *delta* is the data that indicates the changed amount. For details about delta, see *Field values* in this chapter.

- Supported version

  Indicates the Microsoft SQL Server version that can use the field.

  If a version number is shown, the field is supported by that version and all subsequent versions. *All* means that all Microsoft SQL Server versions support the field. *Not supported* means that the field is not supported by Microsoft SQL Server.

- Data source

  Method used to obtain the field value or the source of the data. For details about field values, see *Field values* in this chapter.

List of ODBC key fields

Some ODBC key fields are common to all records, and some are specific to each record. This section presents the ODBC key fields common to all records. You need the ODBC key fields to use record data stored in the Store database by using SQL statements with PFM - Manager.

The table below lists the ODBC key fields common to all records. For details about the ODBC key fields specific to each record, see the details of each record.

Table 5-2: List of ODBC key fields common to all records

ODBC key field	ODBC format	Data	Description
*record-ID*_DATE	SQL_INTEGER	Internal	Key in the record that indicates the record creation date
*record-ID*_DATETIME	SQL_INTEGER	Internal	Combination of the *record-ID*_DATE and *record-ID*_TIME fields
*record-ID*_DEVICEID	SQL_VARCHAR	Internal	*instance-name*[*host-name*]
*record-ID*_DRAWER_TYPE	SQL_VARCHAR	Internal	Type. Valid values are as follows: m: Minute H: Hour D: Day W: Week M: Month Y: Year
*record-ID*_PROD_INST	SQL_VARCHAR	Internal	Instance name of PFM - RM for Microsoft SQL Server
*record-ID*_PRODID	SQL_VARCHAR	Internal	Product ID of PFM - RM for Microsoft SQL Server
*record-ID*_RECORD_TYPE	SQL_VARCHAR	Internal	Identifier indicating the record type (4 bytes)
*record-ID*_TIME	SQL_INTEGER	Internal	Record creation time (Greenwich mean time (GMT))

Summary rules

Summary records contain collected data that is summarized at set intervals (by minute, hour, day, week, month, or year) and saved in the Store database. Data is summarized according to the operation defined for the particular field. These operation definitions are called *summary rules*.

A field called an *additional field* might be added to the Store database when data is summarized. Whether an additional field is generated, and the type of the field if generated, depend on the summary rule. Some additional fields are displayed as record fields in PFM - Web Console. These additional fields, which are displayed in PFM - Web Console, can be used in viewing historical reports.

The fields referred to in the record descriptions in this chapter are called *record-specific fields*, to distinguish them from additional fields generated when data is summarized.

Additional fields have the following field names:

- Additional field contained in the Store database
  Manager name of the record-specific field, plus a suffix
- Additional field displayed in PFM - Web Console
  View name of the record-specific field, plus a suffix

The following table shows the suffix added to the Manager name, the suffix added to the corresponding View name, and the data stored in that field.

Table 5-3: List of suffixes in additional field names

Suffix added to the Manager name	Suffix added to the View name	Field data
_TOTAL	(Total)	Sum of the field values in all records in the summary period
_TOTAL_SEC	(Total)	Sum of the values of the field in the records collected within the summarization period (when the data type of the field is utime)
_COUNT	--	Number of records collected in the summary period
_HI	(Max)	Largest field value in the records in the summary period
_LO	(Min)	Smallest field value in the records in the summary period
_OV	(OV)	The number of times that the sum of the values of the field in the records collected within the summarization period overflowed. The value is determined by using the following formula: (sum-of-the-field-values) / (maximum-value-for-the-existing-field + 1) Note: Numbers after the decimal point are discarded.

Legend:
--: No additional field.

The table below lists the summary rules.

Table 5-4: List of summary rules

Summary rule name	Summary rules
COPY	Stores the actual field value of the most recent record in the summary period.
AVG	Stores the average field value of all field values in the summary period. The average value is calculated using the following expression: (*sum-of-field-values*)/(*number-of-records-collected*) Additional field (Store database) • _TOTAL • _TOTAL_SEC (when the data type of the field is utime)

Summary rule name	Summary rules
AVG	• _COUNT Additional field (PFM - Web Console)[#1, #2] • (Total)
ADD	Sum of the field values in all records in the summary period
ADDBI	The lower bytes of the sum of the field values collected within the summarization period are stored in the Store database. The maximum value is extended to 256 times the maximum value in the ADD rule. The value is determined by using the following formula:(sum-of-the-field-values) % (maximum-value-for-the-existing-field) In the above formula, % indicates that there is a remainder. Added field (Store database): • _OV Added field (PFM - Web Console) : • (OV)
HI	Largest field value in the records in the summary period
LO	Smallest field value in the records in the summary period
--	No summarization

#1

For utime type fields whose Manager names contain the character string _AVG, the (Total) fields that are added in Performance Reporter cannot be used for historical reports.

#2

For fields whose Manager names contain any of the following character strings, the (Total) fields that are added in Performance Reporter cannot be used for historical reports:
PER, PCT, PERCENT, _AVG, _RATE_TOTAL

List of data types

The following table lists the data types for field values and the corresponding C and C++ data types. The values in the *Format* column of the record field tables have the types shown below in the *Field* column under *Data type*.

Table 5-5: List of summary rules

Data type		Byte	Description
Field	C and C++		
`char(n)`	`char( )`	Number in parentheses	Character data of *n* bytes.
`double`	`double`	8	Numeric value (1.7E ± 308 (15 digits))
`long`	`long`	4	Numeric value (-2,147,483,648 to 2,147,483,647)
`string(n)`	`char[ ]`	Number in parentheses	Character string of *n* bytes. • Japanese Windows: Shift-JIS characters can be set. • Simplified-Chinese Windows: GB18030 characters can be set#. • Other Windows: Only 7-bit ASCII characters can be set. The last character is null.
`time_t`	`unsigned long`	4	Numeric value (0 to 4,294,967,295)
`timeval`	Structure	8	Numeric value (first 4 bytes are seconds, next 4 bytes are microseconds)
`ulong`	`unsigned long`	4	Numeric value (0 to 4,294,967,295)
`utime`	Structure	8	Numeric value (first 4 bytes are seconds, next 4 bytes are microseconds)
`word`	`unsigned short`	2	Numeric value (0 to 65,535)
(Not applicable)	`unsigned char`	1	Numeric value (0 to 255)

#

In Simplified-Chinese Windows environment, database name of monitoring target SQL Server don't use out of range of GBK. If you use out of range of GBK in database name, PFM - RM for SQL Server collect performance data fail. In this case, "KAVL19812-E" is output by agent log error file (detail information: rc=0x80040e37, msg include "?").

Field values

This section describes the values that are stored in the fields.

Data source

Each field contains a value obtained from a Performance Management product or program being monitored or the value derived there from by means of applying a formula. In the tables, the *Data source* column indicates the source of the value or the formula used to produce the value.

When a field's value is obtained by processing performance data acquired from Microsoft SQL Server, the character string in the Data source column in PFM - RM for Microsoft SQL Server indicates the method used to obtain the value that is set in the field. In all other cases, the character string indicates the system table name of the Microsoft SQL Server or the Transact-SQL command batch to be used for acquiring data.

Note that if the character string in the *Data source* column consists of upper-case characters and begins with `DBCC`, the character string indicates a DBCC statement of Microsoft SQL Server. In other cases, the character string indicates the Manager name for the field in the record.

Delta

In contrast to the data collected as the cumulative value, the so-called delta is the data that indicates the changed amount. For example, if the performance data value obtained during the first collection is 3 and the performance data value obtained during the second collection is 4, then the cumulative value is 7 and the changed amount is 1. In the tables, the Delta column indicates whether or not each field's value is a delta value.

The following table explains the delta characteristics of performance data collected by PFM - RM for Microsoft SQL Server:

Table 5-6: Performance data collected by PFM - RM for Microsoft SQL Server

Record type	Delta	Data type	Indicate delta value#	Record value
PI record type	Yes	Real-time data	Selected	The displayed value is the changed amount.
			Not selected	The displayed value is the changed amount.
		- Historical data - Alarm monitoring data	N/A	The displayed value is the changed amount.
	No	Real-time data	Selected	The displayed value was the actual value at the time of data collection.
			Not selected	The displayed value was the actual value at the time of data collection.
		- Historical data - Alarm monitoring data	N/A	The displayed value was the actual value at the time of data collection.
PD record type	Yes	Real-time data	Selected	The displayed value is the change.
			Not selected	The displayed value is the cumulative value.
		- Historical data - Alarm monitoring data	N/A	The displayed value is the cumulative value.
	No	Real-time data	Selected	The displayed value was the actual value at the time of data collection.

Record type	Delta	Data type	Indicate delta value#	Record value
PD record type	No	Real-time data	Not selected	The displayed value was the actual value at the time of data collection.
		- Historical data - Alarm monitoring data	N/A	The displayed value was the actual value at the time of data collection.

Legend:

N/A: Not applicable

#

Indicates that the following check boxes are selected in the PFM - Web Console dialog box:

-**Indicate delta value** check box in the Report Wizard - Indication settings (Realtime) dialog box

-**Indicate delta value** check box in **Indication settings (Realtime)** on the **Properties** page of the Report window

The following points should be noted about collection of performance data:

- In the following cases, no value is displayed until the first data has been collected:
  - The **Indicate delta value** check box is selected in the settings for real-time reports based on PI records.
  - The **Indicate delta value** check box is selected in the settings for real-time reports based on PD records.

    However, in reports requiring previous data, the initial values are shown as zero. Starting with the second cycle, the changed amount is displayed.

Fields added only when data is stored in the Store database

The following table lists the fields that are added only when data is stored in the Store database:

Table 5-7: Fields added only when data is stored in the Store database

PFM - View name (PFM - Manager name)	Description	Format	Delta	Data source
Agent Host (DEVICEID)	Name of host where PFM - RM for Microsoft SQL Server is running	string(256)	No	N/A
Agent Instance (PROD_INST)	Instance name of PFM - RM for Microsoft SQL Server	string(256)	No	N/A
Agent Type (PROD_ID)	Product ID of PFM - RM for Microsoft SQL Server (1-byte identifier)	char	No	N/A
Date (DATE)	Record creation date in (GMT)#1, #3	char(3)	No	N/A
Date and Time (DATETIME)	Combination of the Date (DATE) and Time (TIME) fields#3	char(6)	No	N/A
Drawer Type (DRAWER_TYPE)	For a PI record, the data summarization type. The type displayed in PFM - Web Console reports differs from the type displayed using the ODBC driver.#2	char	No	N/A
GMT Offset (GMT_ADJUST)	Difference (in seconds) between Greenwich Mean Time and local time	long	No	N/A
Time (TIME)	Record creation time (GMT)#1, #3	char(3)	No	N/A

Legend:

N/A: The field value is specified without processing the performance data acquired from Microsoft SQL Server.

#1

A basic value is set because records of the PI record type are summarized. The following table shows the setting values for each record type.

Table 5-8: Setting value for each record type

Type	Setting value for each record type
Minute	0 second of the time when the record was created.
Hour	0 minute and 0 second of the time when the record was created.
Day	0:00 and 0 second of the day when the record was created.
Week	0:00 and 0 second on Monday of the week when the record was created.
Month	0:00 and 0 second on the 1st day of the month when the record was created.
Year	0:00 and 0 second on January 1st of the year when the record was created.

#2

The following table shows the type displayed in PFM - Web Console reports and the type displayed using the ODBC driver:

Table 5-9: Difference of displayed types made by PFM - Web Console and ODBC driver

Type	PFM - Web Console	ODBC driver
Minute	Minute	m
Hour	Hour	H
Day	Day	D
Week	Week	W
Month	Month	M
Year	Year	Y

#3

When data is displayed in a report or by using the ODBC driver, the Date field uses the *YYYYMMDD* format, the Date and Time field uses the *YYYYMMDD hh:mm:ss* format, and the Time field uses the hh:mm:ss format.

Fields output when data stored in the Store database is exported

When data stored in the Store database is exported by using the `jpctool db dump` command, the fields listed below are output. These fields are also added when data is stored in the Store database, but since they are used internally by PFM - RM, they are not used as fields displayed in reports, and should not be used during operation.

- *Record ID*_DATE_F
- *Record ID*_DEVICEID_F
- *Record ID*_DRAWER_TYPE_F
- *Record ID*_DRAWER_COUNT
- *Record ID*_DRAWER_COUNT_F
- *Record ID*_INST_SEQ
- *Record ID*_PRODID_F
- *Record ID*_PROD_INST_F
- *Record ID*_RECORD_TYPE
- *Record ID*_RECORD_TYPE_F
- *Record ID*_SEVERITY
- *Record ID*_SEVERITY_F
- *Record ID*_TIME_F
- *Record ID*_UOWID
- *Record ID*_UOWID_F
- *Record ID*_UOW_INST
- *Record ID*_UOW_INST_F
- *Record ID_PFM - Manager name*_COUNT
- *Record ID_PFM - Manager name*_SEC
- *Record ID_PFM - Manager name*_MSEC

Notes on records

Note the following when collecting records.

Results of record generation when no data can be acquired

The following explains the results of record generation when no data can be acquired.

- No records are generated

  In the following cases, no records are generated:

  - PFM - RM for Microsoft SQL Server cannot collect the performance data to be stored in a field that is defined as an ODBC key field.
  - PFM - RM for Microsoft SQL Server cannot collect the performance data to be stored in a field that shows Microsoft SQL Server performance.
- Records with empty fields are generated

  In the following cases, records with empty fields are generated:

  - PFM - RM for Microsoft SQL Server cannot collect data of the character type.
  - PFM - RM for Microsoft SQL Server collects empty data of the character type.
  - Mirror databases exist on the monitoring-target Microsoft SQL Server host (because PFM - RM for Microsoft SQL Server cannot collect performance data from mirror databases).
- Records with a field value of -1 are generated

  When PFM - RM for Microsoft SQL Server cannot collect configuration data of the numeric type, records with a field value of -1 are generated.
- Records with a field value of `Unknown` are generated

  In the following cases, records with a field value of `Unknown` are generated:

  - PFM - RM for Microsoft SQL Server collects data for a field that is defined in the data model, but whose data is not defined.
  - PFM - RM for Microsoft SQL Server cannot collect data for a field defined in the data model.

Record collection fails when the monitoring database is online

If the version of the monitoring-target Microsoft SQL Server is 2005 without SP1 or later, the following record collection from all the databases on the Microsoft SQL Server fails when any one of the databases which consist of the Microsoft SQL Server is turned offline. To collect the records listed below, turn online the databases you turned offline. #

- PD_DD record
- PD_DS record
- PD_SS record
- PI_SI record

#

If the version of the monitoring-target Microsoft SQL Server is 2005 with SP1 or later or 2008, PFM - RM for Microsoft SQL Server can collect performance data from all the databases except offline databases.

Results of record collection when the session to the monitoring-target Microsoft SQL Server is disconnected

If the session to the monitoring-target Microsoft SQL Server is disconnected, the record collection may fail. In this case, when PFM - RM for Microsoft SQL server collects the records next time, PFM - RM for Microsoft SQL Server reestablish the connection to the Microsoft SQL Server and then start collecting the records.

List of records for PFM - RM for Microsoft SQL Server

This section lists the records that can be collected by PFM - RM for Microsoft SQL Server.

Table 5-10 lists the records that can be collected by PFM - RM for Microsoft SQL Server and the information that is stored in each record. The records in the following table are listed in order of record name, respectively.

Table 5－10: List of records for PFM - RM for Microsoft SQL Server

Record name	Record ID	Information stored in record
Config Detail	PD_CD	Information related to Microsoft SQL Server environment setting option
Database Detail	PD_DD	Database information (snapshot), such as the numbers of locks and processes related to a particular database
Database Space Detail	PD_DS	Information related to the size of the disk space used by a particular database
Global Server Summary	PI	Information related to Microsoft SQL Server I/O, network, and so on
Global Server Summary 2	PI_PI2	Information related to Microsoft SQL Server I/O, network, and so on
Instance Availability	PD_IA	Information on the availability of the Microsoft SQL Server instance
Lock Detail	PD_LD	Detailed information related to database locks
Process Detail	PD_PDET	Detailed information on a particular database process, such as locks and I/O
Server Detail	PD	Detailed information on Microsoft SQL Server, such as locks and I/O
Server Locks Detail	PD_LOCK	Information related to Microsoft SQL Server locks
Server Overview	PI_SERV	Overall information related to Microsoft SQL Server, such as the rate of cache hits and I/O
Server Overview 2	PI_SRV2	Overall information related to Microsoft SQL Server, such as the rate of cache hits and I/O
Server Space Detail	PD_SS	Information related to the size of the disk space used by Microsoft SQL Server
Server Space Interval	PI_SI	Interval information related to the size of the disk space used by Microsoft SQL Server
Transaction Log Overview	PI_TLOG	Information related to transaction log space
Errorlog Summary Interval	PI_ESI	This record is reserved and cannot be used.
Errorlog Summary Interval	PI_ESI	
Generic Data Detail	PD_GEND	
Generic Data Interval	PI_GENI	
Restore History Detail	PD_RH	

Config Detail (PD_CD)

Function

The Config Detail (PD_CD) record indicates information related to Microsoft SQL Server environment setting options. One record is created for each environment setting option.

This is a multi-instance record.

Default and changeable values

Item	Default value	Changeable
Collection Interval	60	Y
Collection Offset	0	Y
Log	No	Y
LOGIF	(Blank)	Y

ODBC key field

PD_CD_NAME

Lifetime

From creation to deletion of a Microsoft SQL Server instance

Record size

- Fixed part: 681 bytes
- Variable part: 157 bytes

Fields

View name (Manager name)	Description	Summary	Format	Delta	Data source
Config Value (CONFIG_VALUE)	Environment setting option value	--	long	No	sp_configure.config_value
Current Run Value (RUN_VALUE)	Environment setting option value (execution value at data collection)	--	long	No	sp_configure.run_value
Max Value (MAXIMUM)	Maximum value of environment setting option	--	long	No	sp_configure.maximum
Min Value (MINIMUM)	Minimum value of environment setting option	--	long	No	sp_configure.minimum
Name (NAME)	Name of environment setting option	--	string(141)	No	sp_configure.name
Record Time (RECORD_TIME)	Interval end time (GMT format)	--	time_t	No	Remote Monitor Collector

View name (Manager name)	Description	Summary	Format	Delta	Data source
Record Type (INPUT_RECORD_TYPE)	Record type (always CD)	--	char(8)	No	Remote Monitor Collector
Start Time (START_TIME)	Interval start time (GMT format)	--	time_t	No	Remote Monitor Collector
VA DeviceID(VADEVICEID)	Device ID of virtual agent.	--	string(256)	No	Remote Monitor Collector

Database Detail (PD_DD)

Function

The Database Detail (PD_DD) record indicates database information (snapshot), such as the numbers of locks and processes, related to a particular database. One record is created for each database. This is a multi-instance record.

Default and changeable values

Item	Default value	Changeable
Collection Interval	60	Y
Collection Offset	0	Y
Log	No	Y
LOGIF	(Blank)	Y

ODBC key fields

- PD_DD_DB_NAME
- PD_DD_DBID

Lifetime

From creation to deletion of a database

Record size

- Fixed part: 681 bytes
- Variable part: 1,362 bytes

Fields

View name (Manager name)	Description	Summary	Format	Delta	Data source
Availability (AVAILABILITY)	Database status. The following values are valid: Active Enabled. Process is running. Available Enabled. No process is running. NOT Available A crash or problem may have occurred during loading, and as a result the database cannot be opened or used in its current state. Restricted Database can be used only by its owner or a single user.	COPY	string(16)	No	master..sysdatabases.status

View name (Manager name)	Description	Summary	Format	Delta	Data source
Blocked Processes (BLOCKED)	Number of blocked processes	COPY	word	No	Total number of processes for which the `master..sysprocesses.blocked` value is not 0
Blocking Locks (BLOCKING)	Number of blocking locks	COPY	ulong	No	Number of locks for which the `master..syslockinfo.req_status` value is 3 (standby)
Create Date (CREATE_DATE)	Database creation date	COPY	time_t	No	master..sysdatabases.crdate
DB Name (DB_NAME)	Database name	COPY	string(257)	No	master..sysdatabases.name
DB Owner (DBO)	Database owner	COPY	string(513)	No	Name of the user for which `master..sysdatabases.sid` is equal to `master..syslogins.sid`
DBID (DBID)	Database ID	COPY	word	No	master..sysdatabases.dbid
Demand Locks (DEMAND)	Number of request locks	COPY	ulong	No	master..syslockinfo
Exclusive Intent Locks (EXCLUSIVE_INTENT)	Number of exclusive intent locks	COPY	ulong	No	master..syslockinfo
Exclusive Page Locks (EXCLUSIVE_PAGE)	Number of exclusive page locks	COPY	ulong	No	master..syslockinfo
Exclusive Table Locks (EXCLUSIVE_TABLE)	Number of exclusive table locks	COPY	ulong	No	master..syslockinfo
Last Dump Date (LAST_DUMP)	Last dump date for the transaction log	COPY	time_t	No	msdb.dbo.backupset
Locks (LOCKS)	Total number of locks	COPY	ulong	No	master..syslockinfo
Options (OPTIONS)	Database options currently specified. Delimited by commas.	COPY	string(512)	No	master..sysdatabases.status, master..sysdatabases.status2
Other Processes (OTHER)	Number of other types of processes	COPY	word	No	master..sysprocesses.status
Process Count (PROCESSES)	Total number of processes	COPY	word	No	master..sysprocesses
Record Time (RECORD_TIME)	Interval end time (GMT format)	COPY	time_t	No	Remote Monitor Collector

View name (Manager name)	Description	Summary	Format	Delta	Data source
Record Type (INPUT_RECORD_TYPE)	Record type (always DD)	COPY	char(8)	No	Remote Monitor Collector
Runnable Processes (RUNNABLE)	Number of executable processes	COPY	word	No	master..sysprocesses.status
Running Processes (RUNNING)	Number of processes being executed	COPY	word	No	master..sysprocesses.status
Shared Intent Locks (SHARED_INTENT)	Number of shared intent locks	COPY	ulong	No	master..syslockinfo.rsc_type, master..syslockinfo.req_mode
Shared Page Locks (SHARED_PAGE)	Number of shared page locks	COPY	ulong	No	master..syslockinfo.rsc_type, master..syslockinfo.req_mode
Shared Table Locks (SHARED_TABLE)	Number of shared table locks	COPY	ulong	No	master..syslockinfo.rsc_type, master..syslockinfo.req_mode
Sleeping Processes (SLEEPING)	Number of sleeping processes	COPY	word	No	master..sysprocesses.status
Start Time (START_TIME)	Interval start time (GMT format)	COPY	time_t	No	Remote Monitor Collector
Update Page Locks (UPDATE_PAGE)	Number of update page locks	COPY	ulong	No	master..syslockinfo.rsc_type, master..syslockinfo.req_mode
VA DeviceID(VADEVICEID)	Device ID of virtual agent.	--	string(256)	No	Remote Monitor Collector
Version (VERSION)	Microsoft SQL Server version used for database creation	COPY	word	No	master..sysdatabases.version

Database Space Detail (PD_DS)

Function

The Database Space Detail (PD_DS) record indicates information related to the size of the disk space used by a particular database. One record is created for each database. This is a multi-instance record.

Default and changeable values

Item	Default value	Changeable
Collection Interval	60	Y
Collection Offset	0	Y
Log	No	Y
LOGIF	(Blank)	Y

ODBC key fields

- PD_DS_DB_NAME
- PD_DS_DBID

Lifetime

From the creation until deletion of a database

Record size

- Fixed part: 681 bytes
- Variable part: 331 bytes

Fields

View name (Manager name)	Description	Summary	Format	Delta	Data source
DB Name (DB_NAME)	Database name	--	string(257)	No	master..sysdatabases.name
DB Size (SIZE)	Database size (in megabytes)	--	double	No	dbo.sysfiles
DBID (DBID)	Database ID	--	word	No	master..sysdatabases.dbid
Data Mbytes (DATA)	Size of database being used (in megabytes)	--	double	No	sys.partitions, sys.allocation_units, sys.internal_tables
Free % (PERC_FREE)	Free space as a percentage of the size of the entire database, including data files and transaction log files	--	double	No	dbo.sysfiles, sys.partitions, sys.allocation_units, sys.internal_tables
Free Mbytes (FREE_SPACE)	Size of the free space in the area allocated to the entire database,	--	double	No	dbo.sysfiles, sys.partitions,

View name (Manager name)	Description	Summary	Format	Delta	Data source
Free Mbytes (FREE_SPACE)	including data files and transaction log files (in megabytes)	--	double	No	sys.allocation_units, sys.internal_tables
Index Mbytes (IDX)	Size of index space being used (in megabytes)	--	double	No	sys.partitions, sys.allocation_units, sys.internal_tables
Log Mbytes (LOG)	Size of log space being used (in megabytes)	--	double	No	DBCC SQLPERF(LOGSPACE)
Record Time (RECORD_TIME)	Interval end time (GMT format)	--	time_t	No	Remote Monitor Collector
Record Type (INPUT_RECORD_TYPE)	Record type (always DS)	--	char(8)	No	Remote Monitor Collector
Rsvd Mbytes (RESERVED)	Size of space already allocated (in megabytes)	--	double	No	sys.partitions, sys.allocation_units, sys.internal_tables
Start Time (START_TIME)	Interval start time (GMT format)	--	time_t	No	Remote Monitor Collector
Unused % (PERC_USED)	Unused space as a percentage of total allocated space	--	double	No	sys.partitions, sys.allocation_units, sys.internal_tables
Unused Mbytes (UNUSED)	Size of allocated but unused space (in megabytes)	--	double	No	sys.partitions, sys.allocation_units, sys.internal_tables
VA DeviceID(VADEVICEID)	Device ID of virtual agent.	--	string(256)	No	Remote Monitor Collector

Global Server Summary (PI)

Function

The Global Server Summary (PI) record indicates information related to the Microsoft SQL Server I/O and network. One record is created for each interval.

Default and changeable values

Item	Default value	Changeable
Collection Interval	60	Y
Collection Offset	0	Y
Log	Yes	Y
LOGIF	(Blank)	Y

ODBC key field

None

Lifetime

From the start until stop of a Microsoft SQL Server instance

Record size

- Fixed part: 1,100 bytes
- Variable part: 0 bytes

Fields

View name (Manager name)	Description	Summary	Format	Delta	Data source
CPU % (PERC_BUSY)	Percentage of time CPU is busy[#2]	AVG	double	No	CPU_BUSY / (CPU_BUSY + IDLE + IO_BUSY) * 100
CPU Time (CPU_TIME)	CPU busy time (in seconds and milliseconds) [#2]	AVG	utime	Yes	@@cpu_busy / 1000
CPU Timeticks (CPU_BUSY)	CPU usage time (in ticks)	ADDBI	ulong	Yes	@@cpu_busy * 1000 / @@timeticks
Cache Avg Scan (CACHE_AVG_SCAN)	This field is reserved and cannot be used.	AVG	--	--	--
Conns (CONNECTIONS)	Number of client connections[#2]	AVG	ulong	No	@@connections
I/O %(PERC_IO)	Percentage of CPU time spent for I/O[#2]	AVG	double	No	IO_BUSY / (CPU_BUSY + IDLE + IO_BUSY) * 100

View name (Manager name)	Description	Summary	Format	Delta	Data source
I/O Time(IO_TIME)	CPU time spent for I/O (in seconds and milliseconds) #2	AVG	utime	Yes	@@io_busy / 1000
I/O Timeticks (IO_BUSY)	CPU I/O time (in ticks)	ADDBI	ulong	Yes	@@io_busy * 1000 / @@timeticks
Idle % (PERC_IDLE)	Percentage of time CPU is idle#2	AVG	double	No	IDLE / (CPU_BUSY + IDLE + IO_BUSY) * 100
Idle Time (IDLE_TIME)	CPU idle time (in seconds and milliseconds)#2	AVG	utime	Yes	@@idle / 1000
Idle Timeticks (IDLE)	CPU idle time (in ticks)	ADDBI	ulong	Yes	@@idle * 1000 / @@timeticks
Lazy Writes/sec (LAZY_WRITES_SEC)	Total number of pages flushed by Lazy Writer to a disk (1 page equals 8 kilobytes)#2	AVG	double	No	master..sysperfinfo
Log Writes/sec (LOG_WRITES_SEC)	Total number of log pages written onto a disk#2	AVG	double	No	master..sysperfinfo
Net Queue (NET_QUEUE)	This field is reserved and cannot be used.	AVG	--	--	--
Net Reads/sec (NET_READS_SEC)	This field is reserved and cannot be used.	AVG	--	--	--
Net Writes/sec (NET_WRITES_SEC)	This field is reserved and cannot be used.	AVG	--	--	--
Pkt Errors (PACKET_ERRORS)	Number of packet errors#2	AVG	ulong	Yes	@@packet_errors
Pkts Rcvd (PACK_RECEIVED)	Number of packets received#2	AVG	ulong	Yes	@@pack_received
Pkts Sent (PACK_SENT)	Number of packets sent#2	AVG	ulong	Yes	@@pack_sent
Reads Pending (READS_PENDING)	This field is reserved and cannot be used.	AVG	--	--	--
Record Time (RECORD_TIME)	Interval end time (GMT format) #1	COPY	time_t	No	Remote Monitor Collector
Record Type (INPUT_RECORD_TYPE)	Record type (always PI) #1	COPY	char(8)	No	Remote Monitor Collector
Start Time (START_TIME)	Interval start time (GMT format) #1	COPY	time_t	No	Remote Monitor Collector
Timeticks (TIMETICKS)	Microseconds per tick#1	COPY	ulong	No	@@timeticks
Total Errors (TOTAL_ERRORS)	Number of disk errors#2	AVG	ulong	Yes	@@total_errors
Total Reads	Number of disk read operations#2	AVG	ulong	Yes	@@total_read

View name (Manager name)	Description	Summary	Format	Delta	Data source
(TOTAL_READ)	Number of disk read operations[#2]	AVG	ulong	Yes	@@total_read
Total Writes (TOTAL_WRITE)	Number of disk write operations Number of disk write operations[#2]	AVG	ulong	Yes	@@total_write
Trans/sec (TRANS_SEC)	Total number of Transact-SQL command batches executed [#2]	AVG	double	No	master..sysperfinfo
VA DeviceID(VADEVICE ID)	Device ID of virtual agent.	--	string(256)	No	Remote Monitor Collector
Writes Pending (WRITES_PENDING)	This field is reserved and cannot be used.	AVG	--	--	--

Global Server Summary 2 (PI_PI2)

Function

The Global Server Summary 2(PI_PI2) record indicates information related to the Microsoft SQL Server I/O and network. The Global Server Summary 2(PI_PI2) record acquires from the Microsoft SQL Server the values of the fields which store the cumulative values for "/sec" counters and uses those values to calculate the per-sec value. One record is created for each interval.

Default and changeable values

Item	Default value	Changeable
Collection Interval	60	Y
Collection Offset	0	Y
Log	Yes	Y
LOGIF	(Blank)	Y

ODBC key field

None

Lifetime

From the start until stop of a Microsoft SQL Server instance

Record size

- Fixed part: 1,100 bytes
- Variable part: 0 bytes

Fields

View name (Manager name)	Description	Summary	Format	Delta	Data source
CPU % (PERC_BUSY)	Percentage of time CPU is busy#2	AVG	double	No	CPU_BUSY / (CPU_BUSY + IDLE + IO_BUSY) * 100
CPU Time (CPU_TIME)	CPU busy time (in seconds and milliseconds) #2	AVG	utime	Yes	@@cpu_busy / 1000
CPU Timeticks (CPU_BUSY)	CPU usage time (in ticks)	ADDBI	ulong	Yes	@@cpu_busy * 1000 / @@timeticks
Cache Avg Scan (CACHE_AVG_SCAN)	This field is reserved and cannot be used.	AVG	--	--	--
Conns (CONNECTIONS)	Number of client connections#2	AVG	ulong	No	@@connections
I/O %(PERC_IO)	Percentage of CPU time spent for I/O#2	AVG	double	No	IO_BUSY / (CPU_BUSY + IDLE + IO_BUSY) * 100

View name (Manager name)	Description	Summary	Format	Delta	Data source
I/O Time(IO_TIME)	CPU time spent for I/O (in seconds and milliseconds) [#2]	AVG	utime	Yes	@@io_busy / 1000
I/O Timeticks (IO_BUSY)	CPU I/O time (in ticks)	ADDBI	ulong	Yes	@@io_busy * 1000 / @@timeticks
Idle % (PERC_IDLE)	Percentage of time CPU is idle[#2]	AVG	double	No	IDLE / (CPU_BUSY + IDLE + IO_BUSY) * 100
Idle Time (IDLE_TIME)	CPU idle time (in seconds and milliseconds)[#2]	AVG	utime	Yes	@@idle / 1000
Idle Timeticks (IDLE)	CPU idle time (in ticks)	ADDBI	ulong	Yes	@@idle * 1000 / @@timeticks
Lazy Writes/sec (LAZY_WRITES_SEC)	Number of pages per second flushed by Lazy Writer to a disk within an interval (1 page equals 8 kilobytes)[#2]	AVG	double	No	master..sysperfinfo
Log Writes/sec (LOG_WRITES_SEC)	Number of log pages per second written onto a disk within an interval [#2]	AVG	double	No	master..sysperfinfo
Net Queue (NET_QUEUE)	This field is reserved and cannot be used.	AVG	--	--	--
Net Reads/sec (NET_READS_SEC)	This field is reserved and cannot be used.	AVG	--	--	--
Net Writes/sec (NET_WRITES_SEC)	This field is reserved and cannot be used.	AVG	--	--	--
Pkt Errors (PACKET_ERRORS)	Number of packet errors[#2]	AVG	ulong	Yes	@@packet_errors
Pkts Rcvd (PACK_RECEIVED)	Number of packets received[#2]	AVG	ulong	Yes	@@pack_received
Pkts Sent (PACK_SENT)	Number of packets sent[#2]	AVG	ulong	Yes	@@pack_sent
Reads Pending (READS_PENDING)	This field is reserved and cannot be used.	AVG	--	--	--
Record Time (RECORD_TIME)	Interval end time (GMT format) [#1]	COPY	time_t	No	Remote Monitor Collector
Record Type (INPUT_RECORD_TYPE)	Record type (always PI) [#1]	COPY	char(8)	No	Remote Monitor Collector
Start Time (START_TIME)	Interval start time (GMT format) [#1]	COPY	time_t	No	Remote Monitor Collector
Timeticks (TIMETICKS)	Microseconds per tick[#1]	COPY	ulong	No	@@timeticks
Total Errors (TOTAL_ERRORS)	Number of disk errors[#2]	AVG	ulong	Yes	@@total_errors

View name (Manager name)	Description	Summary	Format	Delta	Data source
Total Reads (TOTAL_READ)	Number of disk read operations[#2]	AVG	ulong	Yes	@@total_read
Total Writes (TOTAL_WRITE)	Number of disk write operations Number of disk write operations[#2]	AVG	ulong	Yes	@@total_write
Trans/sec (TRANS_SEC)	Number of Transact-SQL command batches per second executed within an interval [#2]	AVG	double	No	master..sysperfinfo
VA DeviceID(VADEVICE ID)	Device ID of virtual agent.	--	string(256)	No	Remote Monitor Collector
Writes Pending (WRITES_PENDING)	This field is reserved and cannot be used.	AVG	--	--	--

Instance Availability (PD_IA)

Function

The Instance Availability (PD_IA) record provides information on the availability of the Microsoft SQL Server instance. Only one record is created. To create this record, RM for Microsoft SQL Server attempts to connect to Microsoft SQL Server and then, after a successful connection, immediately disconnects.

Notes:

- If, before the PD_IA record is collected, the maximum number of sessions that have been given permission to connect to the Microsoft SQL Server instance has been reached, the Availability field in the PD_IA record indicates 0 (inactive), but the other records might be obtained normally.
- If the Microsoft SQL Server instance stops operating during record collection, the Availability field in the PD_IA record indicates 0 (inactive), but the other records might be obtained normally.
- If the Microsoft SQL Server instance that was inactive during record collection starts operating, the Availability field in the PD_IA record indicates 1 (active), but the other records might not be obtained.
- If an Instance Availability (PD_IA) record is created while Microsoft SQL Server is inactive, the next creation of an Instance Availability (PD_IA) record will be skipped when the following condition is satisfied:

  Condition:

  -LOGIN_TIMEOUT >= collection-interval-of-the-Instance-Availability(PD_IA)-record
- PFM - RM for SQL Server collects performance data of the record field size from Microsoft SQL Server. Therefore, if Microsoft SQL Server contains data that exceeds the field size of Message field, the last character of the performance data might be unreadable.

Default and changeable values

Item	Default value	Changeable
Collection Interval	60	Y
Collection Offset	0	Y
Log	No	Y
LOGIF	(Blank)	Y

ODBC key field

None

Lifetime

None

Record size

- Fixed part: 987 bytes
- Variable part: 0 bytes

Fields

View name (Manager name)	Description	Summary	Format	Delta	Data source
Availability (AVAILABILITY)	Availability status; valid value is 0 (inactive) or 1 (active)	--	word	No	Remote Monitor Collector
Collect Time (COLLECT_TIME)	Time spent connecting to and disconnecting from Microsoft SQL Server (milliseconds)	--	ulong	No	Remote Monitor Collector
Message (MESSAGE)	Character string of the error message when an attempt to connect to Microsoft SQL Server fails. This is blank when the connection is successful.	--	string(300)	No	Remote Monitor Collector
Record Time (RECORD_TIME)	Interval end time (GMT format)	--	time_t	No	Remote Monitor Collector
Record Type (INPUT_RECORD_TYPE)	Record type (always IA)	--	char(8)	No	Remote Monitor Collector
Start Time (START_TIME)	Interval start time (GMT format)	--	time_t	No	Remote Monitor Collector
VA DeviceID(VADEVICEID)	Device ID of virtual agent.	--	string(256)	No	Remote Monitor Collector

Lock Detail (PD_LD)

Function

The Lock Detail (PD_LD) record indicates detailed information related to database locks. One record is created for each database lock. This is a multi-instance record.

If you collect the Lock Details (PD_LD) record when a large number of transactions or access locks have occurred in the Microsoft SQL Server, the following events might occur.

- Space in the Store database increases.
- Collection takes time, and until the collection has been completed, the collection of other records is skipped.
- A large amount of memory is consumed.

For example, when number of locks temporarily increases during backup of the SQL Server databases, you can set the upper limit by using the LIMIT_PD_LD_NUMBER item in the instance information to reduce system load.

For details about the LIMIT_PD_LD_NUMBER item, see *2.1.4(2)(b) Set the monitoring target*.

Note:

PFM - RM for SQL Server collects performance data of the record field size from Microsoft SQL Server. Therefore, if Microsoft SQL Server contains data that exceeds the field size of Program field or Table field or User field, the last character of the performance data might be unreadable.

Default and changeable values

Item	Default value	Changeable
Collection Interval	60	Y
Collection Offset	0	Y
Log	No	Y
LOGIF	(Blank)	Y

ODBC key field

- PD_LD_DB_NAME
- PD_LD_DBID
- PD_LD_SPID

Lifetime

From the start until release of a lock

Record size

- Fixed part: 681 bytes
- Variable part: 926 bytes

Fields

View name (Manager name)	Description	Summary	Format	Delta	Data source
Blocking Flag(BLOCKING)	This flag indicates whether or not the lock is a blocking lock. The following values are valid: 1 Blocking lock 0 Not a blocking lock	--	word	No	master..syslockinfo.req_status
DB Name (DB_NAME)	Database name related to lock resource	--	string(257)	No	db_name(master..syslockinfo. rsc_dbid)
DBID (DBID)	Database ID related to lock resource	COPY	word	No	master..syslockinfo.rsc_dbid
Demand Flag (DEMAND)	This flag indicates whether or not the lock is a request lock. The following values are valid: 1 Request lock 0 Not a request lock	--	word	No	master..syslockinfo.rsc_type, master..syslockinfo.
Lock Type (TYPE)	Lock type (lock request mode and lock resource type)	--	string(80)	No	master..syslockinfo.req_mode
Orphan Flag (ORPHAN)	This flag indicates whether or not the lock is an isolated lock. The following values are valid: 1 Isolated lock 0 Not an isolated lock	--	word	No	master..sysprocesses
Page # (PAGE)	Number of pages allocated to the lock resource	--	ulong	No	master..syslockinfo.rsc_text
Program (PROGRAM)	Name of the application program that is requesting the lock	--	string(257)	No	master..sysprocesses.program_name
Record Time (RECORD_TIME)	Interval end time (GMT format)	--	time_t	No	Remote Monitor Collector
Record Type (INPUT_RECORD_TYPE)	Record type (always LD)	--	char(8)	No	Remote Monitor Collector
SPID (SPID)	Process ID that is requesting the lock	--	word	No	master..syslockinfo.rsc_spid
Start Time (START_TIME)	Interval start time (GMT format)	--	time_t	No	Remote Monitor Collector
Table (TABLE)	Table name if the lock resource is a table or row	--	string(257)	No	sys.all_objects.name in the row that satisfies the condition master.sys.dm_tran_locks.

View name (Manager name)	Description	Summary	Format	Delta	Data source
Table (TABLE)	Table name if the lock resource is a table or row	--	string(257)	No	resource_associated_entity_id = master.sys.all_objects.object_id for each database.
User (USER)	Logon name of the user who issued the command	--	string(61)	No	master..sysprocesses, master..syslogins
VA DeviceID(VADEVICEID)	Device ID of virtual agent.	--	string(256)	No	Remote Monitor Collector

Process Detail (PD_PDET)

Function

The Process Detail (PD_PDET) record indicates detailed information on a particular database process, such as locks and I/O. One record is created for each database process. This is a multi-instance record.

Note:

PFM - RM for SQL Server collects performance data of the record field size from Microsoft SQL Server. Therefore, if Microsoft SQL Server contains data that exceeds the field size of User field, the last character of the performance data might be unreadable.

Default and changeable values

Item	Default value	Changeable
Collection Interval	60	Y
Collection Offset	0	Y
Log	No	Y
LOGIF	(Blank)	Y

ODBC key field

PD_PDET_SPID

Lifetime

From the start until stop of a process

Record size

- Fixed part: 681 bytes
- Variable part: 1,170 bytes

Fields

View name (Manager name)	Description	Summary	Format	Delta	Data source
Blocked Processes (BLOCKING)	Number of processes blocked by the process	--	word	No	master..sysprocesses.blocked
Blocking Process (BLOCKED)	Process ID of a blocking process, if any	--	word	No	master..sysprocesses.blocked
CPU % (PERC_CPU)	CPU time being used by the process, as a percentage of the CPU time being used by all database processes	--	double	No	master..sysprocesses.cpu
CPU Timeticks (CPU)	Cumulative CPU time of the process (in ticks)	--	ulong	No	master..sysprocesses.cpu
Command (COMMAND)	Name of the command executed	--	string(33)	No	master..sysprocesses.cmd

View name (Manager name)	Description	Summary	Format	Delta	Data source
DB Name (DB_NAME)	Name of the database being used by the process at the time of record acquisition	--	string(257)	No	db_name(master..sysprocesses.dbid)
DBID (DBID)	Database ID being used by the process at the time of record acquisition	--	word	No	master..sysprocesses.dbid
GID (GID)	This field is reserved and cannot be used.	--	--	--	--
Host (HOST)	Host computer name	--	string(257)	No	master..sysprocesses.hostname
Host PID (HOST_PID)	Host process ID	--	long	No	master..sysprocesses.hostprocess
Locks (LOCKS)	Number of locks being requested by the process at the time of record acquisition	--	long	No	master..syslockinfo.req_spid
Mem Usage (MEMUSAGE)	Number of procedure cache pages allocated to the process (1 page equals 8 kilobytes)	--	double	No	master..sysprocesses.memusage
Physical I/O (PHYSICAL_IO)	Cumulative number of times the process executed read/write operations to disks	--	double	No	master..sysprocesses.physical_io
Program (PROGRAM)	Application program name	--	string(257)	No	master..sysprocesses.program_name
Record Time (RECORD_TIME)	Interval end time (GMT format)	--	time_t	No	Remote Monitor Collector
Record Type (INPUT_RECORD_TYPE)	Record type (always PDET)	--	char(8)	No	Remote Monitor Collector
SPID (SPID)	Process ID	--	word	No	master..sysprocesses.spid
Start Time (START_TIME)	Interval start time (GMT format)	--	time_t	No	Remote Monitor Collector
Status (STATUS)	Process status	--	string(61)	No	master..sysprocesses.status
UID (UID)	User ID of the user who executed the command	--	word	No	master..sysprocesses.uid
User (USER)	Logon name of the user who issued the command. If information cannot be obtained from the syslogins system table of Microsoft SQL Server, it is obtained from the sysprocesses system table. If the logon name used is 61 characters or longer, the part exceeding 61 characters is cut off.	--	string(257)	No	master..sysprocesses.sid, master..syslogins.name or master..sysprocesses.sid, master..sysprocesses.loginame

View name (Manager name)	Description	Summary	Format	Delta	Data source
VA DeviceID(VADEVICEID)	Device ID of virtual agent.	--	string(256)	No	Remote Monitor Collector

Server Detail (PD)

Function

The Server Detail (PD) record indicates detailed information on Microsoft SQL Server, such as I/O and locks. Only one record is created.

Default and changeable values

Item	Default value	Changeable
Collection Interval	60	Y
Collection Offset	0	Y
Log	No	Y
LOGIF	(Blank)	Y

ODBC key field

None

Lifetime

From the start until stop of a Microsoft SQL Server instance

Record size

- Fixed part: 1,303 bytes
- Variable part: 0 bytes

Fields

View name (Manager name)	Description	Summary	Format	Delta	Data source
Avg Cache Scan(CACHE_AVG_SCAN)	This field is reserved and cannot be used.	--	--	--	--
Blocked Processes (BLOCKED)	Number of processes that are waiting because a process running on Microsoft SQL Server is locked	--	word	No	master..sysprocesses.blocked
Blocking Locks (BLOCKING)	Number of blocking locks	--	ulong	No	master..syslockinfo.req_status
Boot Time (BOOT_TIME)	This field is reserved and cannot be used.	--	--	--	--
CPU % (PERC_BUSY)	Percentage of time CPU is busy	--	double	No	CPU_BUSY / (CPU_BUSY + IDLE + IO_BUSY) * 100
CPU Time (CPU_TIME)	CPU busy time (in seconds and milliseconds)	--	utime	Yes	@@cpu_busy / 1000

View name (Manager name)	Description	Summary	Format	Delta	Data source
CPU Timeticks (CPU_BUSY)	CPU usage time (in ticks)	--	ulong	Yes	@@cpu_busy * 1000 / @@timeticks
Cache Buffers Free (CACHE_FREE_BUFFERS)	Number of data cache buffers inside a free pool. For Microsoft SQL Server 2012, this item is always `0`.	--	word	No	master..sysperfinfo.free pages
Cache Hit % (CACHE_HIT_RATIO)	Rate at which data pages were found inside the data cache within an interval	--	double	No	master..sysperfinfo.buffer cache hit ratio / buffer cache hit ratio base * 100
Conns (CONNECTIONS)	Number of client connections	--	ulong	No	@@connections
DSQuery (DS_QUERY)	Value of DSQUERY environment variable. Character string is truncated at 30 bytes.	--	string(31)	No	#
Database Count (DATABASES)	Database count	--	word	No	master..sysdatabases
Demand Locks (DEMAND)	Number of request locks	--	ulong	No	master..syslockinfo.rsc_type, master..syslockinfo.req_mode
Exclusive Intent Locks (EXCLUSIVE_INTENT)	Number of exclusive intent locks	--	ulong	No	master..syslockinfo.rsc_type, master..syslockinfo.req_mode
Exclusive Page Locks (EXCLUSIVE_PAGE)	Number of exclusive page locks	--	ulong	No	master..syslockinfo.rsc_type, master..syslockinfo.req_mode
Exclusive Table Locks (EXCLUSIVE_TABLE)	Number of exclusive table locks	--	ulong	No	master..syslockinfo.rsc_type, master..syslockinfo.req_mode
Host OS (OS)	OS under which Microsoft SQL Server is running. Data is truncated after 30 bytes.	--	string(31)	No	Value of registry-key \SOFTWARE\Microsoft \WindowsNT \CurrentVersion \ProductName
Host Type (HOST_TYPE)	Type of machine on which Microsoft SQL Server is running. Either of the following values is displayed: • For the 32-bit and 64-bit (IPF) versions of Microsoft SQL Server: `Intel` • For the 64-bit version of Microsoft SQL Server (x64): `X64`	--	string(31)	No	@@version
I/O % (PERC_IO)	Percentage of CPU time spent for I/O	--	double	No	IO_BUSY / (CPU_BUSY + IDLE + IO_BUSY) * 100

View name (Manager name)	Description	Summary	Format	Delta	Data source
I/O Time (IO_TIME)	Percentage of CPU time spent for I/O (in seconds and milliseconds)	--	utime	Yes	@@io_busy / 1000
I/O Timeticks (IO_BUSY)	CPU I/O time (in ticks)	--	ulong	Yes	@@io_busy * 1000 / @@timeticks
Idle % (PERC_IDLE)	Percentage of time CPU is idle	--	double	No	IDLE / (CPU_BUSY + IDLE + IO_BUSY) * 100
Idle Time (IDLE_TIME)	Percentage of time CPU is idle (in seconds and milliseconds)	--	utime	Yes	@@idle / 1000
Idle Timeticks (IDLE)	CPU idle time (in ticks)	--	ulong	Yes	@@idle * 1000 / @@timeticks
Lazy Writes/sec (LAZY_WRITES_SEC)	Total number of pages flushed by Lazy Writer to a disk (1 page equals 8 kilobytes)	--	double	No	master..sysperfinfo.lazy writer buffers/sec
Locks (LOCKS)	Total number of locks	--	ulong	No	master..syslockinfo
Log Writes/sec (LOG_WRITES_SEC)	Total number of log pages written onto a disk	--	double	No	master..sysperfinfo.log flushes/sec
Max Cache Scan (CACHE_MAX_SCAN)	This field is reserved and cannot be used.	--	--	--	--
Net Queue (NET_QUEUE)	This field is reserved and cannot be used.	--	--	--	--
Net Reads/Sec (NET_READS_SEC)	This field is reserved and cannot be used.	--	--	--	--
Net Writes/Sec (NET_WRITES_SEC)	This field is reserved and cannot be used.	--	--	--	--
Other Processes (OTHER)	Number of processes of other types	--	word	No	master..sysprocesses.status
Page Reads/sec (PAGE_READS_SEC)	Total number of physical page read operations	--	double	No	master..sysperfinfo.page reads/sec
Page Writes/sec (PAGE_WRITES_SEC)	Total number of physical page write operations	--	double	No	master..sysperfinfo.page writes/sec
Pkt Errors (PACKET_ERRORS)	Number of packet errors	--	ulong	Yes	@@packet_errors
Pkts Rcvd (PACK_RECEIVED)	Number of packets received	--	ulong	Yes	@@pack_received
Pkts Sent (PACK_SENT)	Number of packets sent	--	ulong	Yes	@@pack_sent
Process Count (PROCESSES)	Total number of processes	--	word	No	master..sysprocesses

View name (Manager name)	Description	Summary	Format	Delta	Data source
RA Pages Fetched (RA_PAGES_FETCHED)	Total number of pages prefetched into the cache by Read Ahead Manager	--	double	No	master..sysperfinfo.readahead pages/sec
RA Pages Found (RA_PAGES_FOUND)	This field is reserved and cannot be used.	--	--	--	--
RA Reads/sec (RA_READS_SEC)	Total number of physical read operations executed by Read Ahead Manager	--	double	No	master..sysperfinfo.page reads/sec
RA Slots Used (RA_SLOTS_USED)	This field is reserved and cannot be used.	--	--	--	--
Reads Pending (READS_PENDING)	This field is reserved and cannot be used.	--	--	--	--
Record Time (RECORD_TIME)	Interval end time (GMT format)	--	time_t	No	Remote Monitor Collector
Record Type (INPUT_RECORD_TYPE)	Record type (always PD)	--	char(8)	No	Remote Monitor Collector
Runnable Processes (RUNNABLE)	Number of executable processes	--	word	No	master..sysprocesses.status
Running Processes (RUNNING)	Number of processes being executed	--	word	No	master..sysprocesses.status
Server Name (SERVER_NAME)	Name of machine on which Microsoft SQL Server is running	--	string(257)	No	@@servername
Shared Intent Locks (SHARED_INTENT)	Number of shared intent locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Shared Page Locks (SHARED_PAGE)	Number of shared page locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Shared Table Locks (SHARED_TABLE)	Number of shared table locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Sleeping Processes (SLEEPING)	Number of sleeping processes	--	word	No	master..sysprocesses.status
Start Time (START_TIME)	Interval start time (GMT format)	--	time_t	No	Remote Monitor Collector
Timeticks (TIMETICKS)	Microseconds per tick	--	ulong	No	@@timeticks
Total Errors (TOTAL_ERRORS)	Number of disk errors	--	ulong	Yes	@@total_errors
Total Reads (TOTAL_READ)	Number of disk read operations	--	ulong	Yes	@@total_read
Total Writes	Number of disk write operations	--	ulong	Yes	@@total_write

View name (Manager name)	Description	Summary	Format	Delta	Data source
(TOTAL_WRITE)	Number of disk write operations	--	ulong	Yes	@@total_write
Trans/sec (TRANS_SEC)	Total number of Transact-SQL command batches executed	--	double	No	master..sysperfinfo.batch requests/sec
Update Page Locks (UPDATE_PAGE)	Number of update page locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
VA DeviceID(VADEVICEID)	Device ID of virtual agent.	--	string(256)	No	Remote Monitor Collector
Version (SERVER_VERSION)	Microsoft SQL Server version	--	string(20)	No	SERVERPROPERTY('productversion')
Writes Pending (WRITES_PENDING)	This field is reserved and cannot be used.	--	--	--	--

#

N/A is always displayed.

Server Locks Detail (PD_LOCK)

Function

The Server Locks Detail (PD_LOCK) record indicates information related to Microsoft SQL Server locks. Only one record is created.

Default and changeable values

Item	Default value	Changeable
Collection Interval	60	Y
Collection Offset	0	Y
Log	No	Y
LOGIF	(Blank)	Y

ODBC key field

None

Lifetime

From the start until stop of a Microsoft SQL Server instance

Record size

- Fixed part: 757 bytes
- Variable part: 0 bytes

Fields

View name (Manager name)	Description	Summary	Format	Delta	Data source
Exclusive Extent Locks(EXTENT_LOCKS_EXCLUSIVE)	Number of exclusive extent locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Exclusive Intent Locks (INTENT_LOCKS_EXCLUSIVE)	Number of exclusive intent locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Exclusive Page Locks (PAGE_LOCKS_EXCLUSIVE)	Number of exclusive page locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Exclusive Table Locks (TABLE_LOCKS_EXCLUSIVE)	Number of exclusive table locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Max Users Blocked (MAX_USERS_BLOCKED)	Maximum number of users who were blocked by other users during the monitored period	--	ulong	No	master..sysprocesses.blocked

View name (Manager name)	Description	Summary	Format	Delta	Data source
Record Time (RECORD_TIME)	Interval end time (GMT format)	--	time_t	No	Remote Monitor Collector
Record Type (INPUT_RECORD_TYPE)	Record type (always LOCK)	--	char(8)	No	Remote Monitor Collector
Shared Intent Locks (INTENT_LOCKS_SHARED)	Number of shared intent locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Shared Page Locks (PAGE_LOCKS_SHARED)	Number of shared page locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Shared Table Locks (TABLE_LOCKS_SHARED)	Number of shared table locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Start Time (START_TIME)	Interval start time (GMT format)	--	time_t	No	Remote Monitor Collector
Total Blocking Locks (TOTAL_BLOCKING_LOCKS)	Number of locks that are blocking other processes	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Total Exclusive Locks (TOTAL_EXCLUSIVE_LOCKS)	Total number of exclusive locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Total Extent Locks (EXTENT_LOCKS_TOTAL)	Total number of extent locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Total Intent Locks (INTENT_LOCKS_TOTAL)	Total number of intent locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Total Locks (TOTAL_LOCKS)	Total number of locks being used by Microsoft SQL Server	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Total Page Locks (PAGE_LOCKS_TOTAL)	Total number of page locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Total Shared Locks (TOTAL_SHARED_LOCKS)	Total number of shared locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Total Table Locks (TABLE_LOCKS_TOTAL)	Total number of table locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Update Extent Locks (EXTENT_LOCKS_UPDATE)	Number of update extent locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode
Update Page Locks (PAGE_LOCKS_UPDATE)	Number of update page locks	--	ulong	No	master..syslockinfo.rsc_type,master..syslockinfo.req_mode

View name (Manager name)	Description	Summary	Format	Delta	Data source
Users Blocked (USERS_BLOCKED)	Number of users who are blocked by other users	--	ulong	No	master..sysprocesses.blocked
VA DeviceID(VADEVICEID)	Device ID of virtual agent.	--	string(256)	No	Remote Monitor Collector

Server Overview (PI_SERV)

Function

The Server Overview (PI_SERV) record indicates overall information related to Microsoft SQL Server, such as rate of cache hits and I/O. Only one record is created.

Default and changeable values

Item	Default value	Changeable
Collection Interval	60	Y
Collection Offset	0	Y
Log	No	Y
LOGIF	(Blank)	Y

ODBC key field

None

Lifetime

From the start until stop of a Microsoft SQL Server instance

Record size

- Fixed part: 1,009 bytes
- Variable part: 0 bytes

Fields

View name (Manager name)	Description	Summary	Format	Delta	Data source
Avg Cache Scan (CACHE_AVG_FREE_PAGE_SCAN)	This field is reserved and cannot be used.	AVG	--	--	--
Cache Buffers Free (CACHE_NUMBER_OF_FREE_BUFFERS)	Number of data cache buffers inside a free pool at the time of data collection. For Microsoft SQL Server 2012, this item is always 0.	AVG	ulong	No	master..sysperfinfo.free pages
Cache Hit % (CACHE_HIT_RATIO)	Rate at which data pages were found inside the data cache	AVG	double	No	master..sysperfinfo.buffer cache hit ratio / buffer cache hit ratio base * 100
Command Queue Length (NET_COMMAND_QUEUE_LENGTH)	This field is reserved and cannot be used.	AVG	--	--	--
Lazy Writes/sec	Total number of pages flushed by Lazy Writer to a disk (1 page equals 8 kilobytes)	AVG	double	No	master..sysperfinfo.Lazy writes/sec

View name (Manager name)	Description	Summary	Format	Delta	Data source
(IO_LAZY_WRITES_PER_SEC)	Total number of pages flushed by Lazy Writer to a disk (1 page equals 8 kilobytes)	AVG	double	No	master..sysperfinfo.Lazy writes/sec
Log Writes/sec (IO_LOG_WRITES_PER_SEC)	Total number of log pages physically written onto a disk	AVG	double	No	master..sysperfinfo.log flushes/sec
Max Cache Scan (CACHE_MAX_FREE_PAGE_SCAN)	This field is reserved and cannot be used.	HI	--	--	--
Max Tempdb Space Used Mbytes (MAX_TEMPDB_SPACE_USED_MB)	Maximum value of the space used in tempdb within an interval (in megabytes)	HI	double	No	master..sysperfinfo.data file(s) size (kb) / 1024
Max Users Conn'd (MAX_USERS_CONNECTED)	Maximum number of user connections established within an interval	HI	ulong	No	master..sysperfinfo.user connections
Net Reads/sec (NET_NETWORK_READS_PER_SEC)	This field is reserved and cannot be used.	AVG	--	--	--
Net Writes/sec (NET_NETWORK_WRITES_PER_SEC)	This field is reserved and cannot be used.	AVG	--	--	--
Page Reads/sec (IO_PAGE_READS_PER_SEC)	Total number of physical page read operations executed	AVG	double	No	master..sysperfinfo.page reads/sec
Page Writes/sec (IO_PAGE_WRITES_PER_SEC)	Total number of physical page write operations executed	AVG	double	No	master..sysperfinfo.page writes/sec
RA Pages Fetched into Cache/sec (RA_PAGES_FETCHED_INTO_CACHE_PER_SEC)	Total number of pages prefetched into the cache by Read Ahead Manager	AVG	double	No	master..sysperfinfo.readahead pages/sec
RA Pages Found in Cache/sec (RA_PAGES_FOUND_IN_CACHE_PER_SEC)	This field is reserved and cannot be used.	AVG	--	--	--
RA Physical Reads/sec (RA_PHYSICAL_READS_PER_SEC)	Total number of physical read operations issued by Read Ahead Manager. (A single read operation is 8 pages,	AVG	double	No	master..sysperfinfo.page reads/sec
RA Slots Used (RA_SLOTS_USED)	This field is reserved and cannot be used.	COPY	--	--	--
Reads Pending (IO_OUTSTANDING_READS)	This field is reserved and cannot be used.	AVG	--	--	--

View name (Manager name)	Description	Summary	Format	Delta	Data source
Record Time (RECORD_TIME)	Interval end time (GMT format)	COPY	time_t	No	Remote Monitor Collector
Record Type (INPUT_RECORD_TYPE)	Record type (always SERV)	COPY	char(8)	No	Remote Monitor Collector
Start Time (START_TIME)	Interval start time (GMT format)	COPY	time_t	No	Remote Monitor Collector
Trans/sec (IO_TRANSACTIONS_PER_SEC)	Total number of Transact-SQL command batches executed	AVG	double	No	master..sysperfinfo.batch requests/sec
User Conns (USER_CONNECTIONS)	Number of client connections	COPY	ulong	No	master..sysperfinfo.user connections
VA DeviceID(VADEVICEID)	Device ID of virtual agent.	--	string(256)	No	Remote Monitor Collector
Writes Pending (IO_OUTSTANDING_WRITES)	This field is reserved and cannot be used.	AVG	--	--	--

Server Overview 2 (PI_SRV2)

Function

The Server Overview 2(PI_SRV2) record indicates overall information related to Microsoft SQL Server, such as rate of cache hits and I/O. The Server Overview 2(PI_SRV2) record acquires from the Microsoft SQL Server the values of the fields which store the cumulative values for "/sec" counters and uses those values to calculate the per-sec value. Only one record is created.

Default and changeable values

Item	Default value	Changeable
Collection Interval	60	Y
Collection Offset	0	Y
Log	No	Y
LOGIF	(Blank)	Y

ODBC key field

None

Lifetime

From the start until stop of a Microsoft SQL Server instance

Record size

- Fixed part: 1,009 bytes
- Variable part: 0 bytes

Fields

View name (Manager name)	Description	Summary	Format	Delta	Data source
Avg Cache Scan (CACHE_AVG_FREE_PAGE_SCAN)	This field is reserved and cannot be used.	AVG	--	--	--
Cache Buffers Free (CACHE_NUMBER_OF_FREE_BUFFERS)	Number of data cache buffers inside a free pool at the time of data collection. For Microsoft SQL Server 2012, this item is always 0.	AVG	ulong	No	master..sysperfinfo.free pages
Cache Hit % (CACHE_HIT_RATIO)	Rate at which data pages were found inside the data cache	AVG	double	No	master..sysperfinfo.buffer cache hit ratio / buffer cache hit ratio base * 100
Command Queue Length (NET_COMMAND_QUEUE_LENGTH)	This field is reserved and cannot be used.	AVG	--	--	--

View name (Manager name)	Description	Summary	Format	Delta	Data source
Lazy Writes/sec (IO_LAZY_WRITES_PER_SEC)	Number of pages per second flushed by Lazy Writer to a disk within an interval (1 page equals 8 kilobytes)	AVG	double	No	master..sysperfinfo.Lazy writes/sec
Log Writes/sec (IO_LOG_WRITES_PER_SEC)	Number of log pages per second physically written onto a disk within an interval	AVG	double	No	master..sysperfinfo.log flushes/sec
Max Cache Scan (CACHE_MAX_FREE_PAGE_SCAN)	This field is reserved and cannot be used.	HI	--	--	--
Max Tempdb Space Used Mbytes (MAX_TEMPDB_SPACE_USED_MB)	Maximum value of the space used in tempdb within an interval (in megabytes)	HI	double	No	master..sysperfinfo.data file(s) size (kb) / 1024
Max Users Conn'd (MAX_USERS_CONNECTED)	Maximum number of user connections established within an interval	HI	ulong	No	master..sysperfinfo.user connections
Net Reads/sec (NET_NETWORK_READS_PER_SEC)	This field is reserved and cannot be used.	AVG	--	--	--
Net Writes/sec (NET_NETWORK_WRITES_PER_SEC)	This field is reserved and cannot be used.	AVG	--	--	--
Page Reads/sec (IO_PAGE_READS_PER_SEC)	Number of physical pages read per second within an interval	AVG	double	No	master..sysperfinfo.page reads/sec
Page Writes/sec (IO_PAGE_WRITES_PER_SEC)	Number of physical pages written per second within an interval	AVG	double	No	master..sysperfinfo.page writes/sec
RA Pages Fetched into Cache/sec (RA_PAGES_FETCHED_INTO_CACHE_PER_SEC)	Number of pages per second prefetched into the cache by Read Ahead Manager within an interval	AVG	double	No	master..sysperfinfo.readahead pages/sec
RA Pages Found in Cache/sec (RA_PAGES_FOUND_IN_CACHE_PER_SEC)	This field is reserved and cannot be used.	AVG	--	--	--
RA Physical Reads/sec (RA_PHYSICAL_READS_PER_SEC)	Number of physical read operations per second issued by Read Ahead Manager within an interval. (A single read operation involves 8 pages, each of which is 8 kilobytes)	AVG	double	No	master..sysperfinfo.page reads/sec
RA Slots Used (RA_SLOTS_USED)	This field is reserved and cannot be used.	COPY	--	--	--
Reads Pending	This field is reserved and cannot be used.	AVG	--	--	--

View name (Manager name)	Description	Summary	Format	Delta	Data source
(IO_OUTSTANDING_READS)	This field is reserved and cannot be used.	AVG	--	--	--
Record Time (RECORD_TIME)	Interval end time (GMT format)	COPY	time_t	No	Remote Monitor Collector
Record Type (INPUT_RECORD_TYPE)	Record type (always SERV)	COPY	char(8)	No	Remote Monitor Collector
Start Time (START_TIME)	Interval start time (GMT format)	COPY	time_t	No	Remote Monitor Collector
Trans/sec (IO_TRANSACTIONS_PER_SEC)	Number of Transact-SQL command batches per second executed within an interval	AVG	double	No	master..sysperfinfo.batch requests/sec
User Conns (USER_CONNECTIONS)	Number of client connections	COPY	ulong	No	master..sysperfinfo.user connections
VA DeviceID(VADEVICEID)	Device ID of virtual agent.	--	string(256)	No	Remote Monitor Collector
Writes Pending (IO_OUTSTANDING_WRITES)	This field is reserved and cannot be used.	AVG	--	--	--

Server Space Detail (PD_SS)

Function

The Server Space Detail (PD_SS) record indicates information related to the size of the disk space used by Microsoft SQL Server. One record is created for each Microsoft SQL Server instance.

Default and changeable values

Item	Default value	Changeable
Collection Interval	60	Y
Collection Offset	0	Y
Log	No	Y
LOGIF	(Blank)	Y

ODBC key field

None

Lifetime

From the creation until deletion of an instance

Record size

- Fixed part: 753 bytes
- Variable part: 0 bytes

Fields

View name (Manager name)	Description	Summary	Format	Delta	Data source
DB Size (SIZE)	Size of the entire database (in megabytes)	--	double	No	sp_databases.db_size
Data Mbytes (DATA)	Size of the database being used (in megabytes)	--	double	No	sys.partitions, sys.allocation_units, sys.internal_tables
Free % (PERC_FREE)	Free space as a percentage of the size of the entire database, including data files and transaction log files	--	double	No	dbo.sysfiles, sys.partitions, sys.allocation_units, sys.internal_tables
Free Mbytes (FREE_SPACE)	Size of the free space in the area allocated to the entire database, including data files and transaction log files (in megabytes)	--	double	No	dbo.sysfiles, sys.partitions, sys.allocation_units, sys.internal_tables
Index Mbytes (IDX)	Size of index space being used (in megabytes)	--	double	No	sys.partitions, sys.allocation_units, sys.internal_tables

View name (Manager name)	Description	Summary	Format	Delta	Data source
Log Mbytes (LOG)	Size of log space being used (in megabytes)	--	double	No	DBCC SQLPERF(LOGSPACE)
Record Time (RECORD_TIME)	Interval end time (GMT format)	--	time_t	No	Remote Monitor Collector
Record Type (INPUT_RECORD_TYPE)	Record type (always SS)	--	char(8)	No	Remote Monitor Collector
Rsvd Mbytes (RESERVED)	Size of space already allocated (in megabytes)	--	double	No	sys.partitions, sys.allocation_units, sys.internal_tables
Start Time (START_TIME)	Interval start time (GMT format)	--	time_t	No	Remote Monitor Collector
Unused % (PERC_USED)	Unused space as a percentage of total allocated space	--	double	No	sys.partitions, sys.allocation_units, sys.internal_tables
Unused Mbytes (UNUSED)	Size of allocated but unused space (in megabytes)	--	double	No	sys.partitions, sys.allocation_units, sys.internal_tables
VA DeviceID(VADEVICEID)	Device ID of virtual agent.	--	string(256)	No	Remote Monitor Collector

Server Space Interval (PI_SI)

Function

The Server Space Interval (PI_SI) record indicates interval information related to the size of the disk space used by Microsoft SQL Server. One record is created for each Microsoft SQL Server instance.

Default and changeable values

Item	Default value	Changeable
Collection Interval	60	Y
Collection Offset	0	Y
Log	No	Y
LOGIF	(Blank)	Y

ODBC key field

None

Lifetime

From the creation until deletion of an instance

Record size

- Fixed part: 777 bytes
- Variable part: 0 bytes

Fields

View name (Manager name)	Description	Summary	Format	Delta	Data source
DB Size (SIZE)	Size of the entire database (in megabytes)	COPY	double	No	dbo.sysfiles
Data Mbytes (DATA)	Size of database being used (in megabytes)	COPY	double	No	sys.partitions, sys.allocation_units, sys.internal_tables
Free % (PERC_FREE)	Free space as a percentage of the size of the entire database, including data files and transaction log files	AVG	double	No	dbo.sysfiles, sys.partitions, sys.allocation_units, sys.internal_tables
Free Mbytes (FREE_SPACE)	Size of the free space in the area allocated to the entire database, including data files and transaction log files (in megabytes)	LO	double	No	dbo.sysfiles, sys.partitions, sys.allocation_units, sys.internal_tables
Index Mbytes (IDX)	Size of index space being used (in megabytes)	COPY	double	No	sys.partitions, sys.allocation_units, sys.internal_tables

View name (Manager name)	Description	Summary	Format	Delta	Data source
Log Mbytes (LOG)	Size of log space being used (in megabytes)	COPY	double	No	DBCC SQLPERF(LOGSPACE)
Record Time (RECORD_TIME)	Interval end time (GMT format)	COPY	time_t	No	Remote Monitor Collector
Record Type (INPUT_RECORD_TYPE)	Record type (always SI)	COPY	char(8)	No	Remote Monitor Collector
Rsvd Mbytes (RESERVED)	Size of space already allocated (in megabytes)	COPY	double	No	sys.partitions, sys.allocation_units, sys.internal_tables
Start Time (START_TIME)	Interval start time (GMT format)	COPY	time_t	No	Remote Monitor Collector
Unused % (PERC_USED)	Unused space as a percentage of total allocated space	AVG	double	No	sys.partitions, sys.allocation_units, sys.internal_tables
Unused Mbytes (UNUSED)	Size of allocated but unused space (in megabytes)	COPY	double	No	sys.partitions, sys.allocation_units, sys.internal_tables
VA DeviceID(VADEVICEID)	Device ID of virtual agent.	--	string(256)	No	Remote Monitor Collector

Transaction Log Overview (PI_TLOG)

Function

The Transaction Log Overview (PI_TLOG) record indicates information related to transaction log space. One record is created for each database transaction log. This is a multi-instance record.

Default and changeable values

Item	Default value	Changeable
Collection Interval	60	Y
Collection Offset	0	Y
Log	No	Y
LOGIF	(Blank)	Y

ODBC key field

PI_TLOG_DB_NAME

Lifetime

From the creation until deletion of a database

Record size

- Fixed part: 681 bytes
- Variable part: 313 bytes

Fields

View name (Manager name)	Description	Summary	Format	Delta	Data source
DB Name (DB_NAME)	Database name[#1]	COPY	string(257)	No	DBCC SQLPERF(LOGSPACE)
Log Size Mbytes (LOG_SIZE_MB)	Size of space allocated to transaction log (in megabytes) [#2]	AVG	double	No	DBCC SQLPERF(LOGSPACE)
Log Space Used % (LOG_SPACE_USED_PCT)	Percentage of transaction log space being used by transaction log[#2]	AVG	double	No	DBCC SQLPERF(LOGSPACE)
Max Log Space Used % (MAX_LOG_SPACE_USED_PCT)	Maximum percentage of log space used within an interval	HI	double	No	DBCC SQLPERF(LOGSPACE)
Max Log Space Used Mbytes (MAX_LOG_SPACE_USED_MB)	Maximum size of log space used within an interval (in megabytes)	HI	double	No	DBCC SQLPERF(LOGSPACE)

View name (Manager name)	Description	Summary	Format	Delta	Data source
Record Time (RECORD_TIME)	Interval end time (GMT format) #1	COPY	time_t	No	Remote Monitor Collector
Record Type (INPUT_RECORD_TYPE)	Record type (always TLOG) #1	COPY	char(8)	No	Remote Monitor Collector
Start Time (START_TIME)	Interval start time (GMT format) #1	COPY	time_t	No	Remote Monitor Collector
VA DeviceID(VADEVICEID)	Device ID of virtual agent.	--	string(256)	No	Remote Monitor Collector

6 Messages

This chapter describes the message format used by PFM - RM for Microsoft SQL Server, lists the locations to which messages are output, shows which messages are output to the Windows event log, and describes the messages in detail.

6.1 Message format

This section shows the format of messages that are issued by PFM - RM for Microsoft SQL Server, and the notations used in this manual to explain the messages.

6.1.1 Format of output messages

This subsection explains the format of the messages issued by PFM - RM for Microsoft SQL Server. Each message consists of the message ID, followed by the message text. The message format is as follows:

`KAVL`*`nnnnn-Y message-text`*

The message ID indicates the following:

K
System identifier.

AVL
Indicates a PFM - RM for Microsoft SQL Server message.

nnnnn
Serial number of the message. PFM - RM for Microsoft SQL Server message numbers are in the format 19*xxx*.

Y
Type of message:

- `E`: Error
  Message issued when the system cancels processing.
- `W`: Warning
  Message issued when the system resumes processing after message output.
- `I`: Information
  Message in which the system provides the user with information.
- `Q`: Query
  Message in which the system prompts the user for a response.

The following is the correspondence of the message types to the Windows event log types:

`-E`

- Level: Error
- Description: Error message

`-W`

- Level: Warning
- Description: Warning message

`-I`

- Level: Information
- Description: Additional information message

`-Q`
(Not output)

6.1.2 Format of message explanation

This section describes the format used to explain messages in this manual. The portion of message text that is shown in bold represents information that is variable depending on the situation. The manual lists the messages in the order of the message IDs. The following illustrates the format of a message explanation:

message-ID

message-text

Explanation of the message

(S)

Explains the processing performed by the system.

(O)

Explains the action the operator should take when the message is displayed.

Reference note:

When contacted by an operator, see *7. Error Handling Procedures*, collect the log information, and conduct initial checking. When you conduct initial checking to determine the cause of a problem, examine all applicable log information, such as the log information for the OS (Windows event log) and the log information output by PFM - RM for Microsoft SQL Server. This log information enable you to understand the details of the problem, take appropriate action, and prevent the problem from occurring in the future. You should also make a record of the operations that led to the problem and determine whether or not the problem is likely to recur.

6.2 Message output destinations

This section shows the output destinations of the messages issued by PFM - RM for Microsoft SQL Server.

In the following table, Y and N have the following meanings:

Legend:

Y: Message is output.

N: Message is not output.

Table 6-1: Output destinations of PFM - RM for Microsoft SQL Server messages

Message ID	Output destination					
	Windows event log	Common message log	Agent log		JP1 system event[#1]	Agent event[#2]
			Normal log	Error log		
KAVL19001-I	Y	Y	N	N	N	N
KAVL19002-E	Y	Y	N	N	N	N
KAVL19003-I	Y	Y	N	N	N	N
KAVL19004-E	Y	Y	N	N	N	N
KAVL19200-I	N	Y	N	N	N	N
KAVL19400-W	N	Y	N	N	N	N
KAVL19401-W	N	Y	N	N	Y	N
KAVL19403-W	N	Y	N	N	N	N
KAVL19404-W	N	Y	N	N	N	N
KAVL19405-W	N	Y	N	N	N	N
KAVL19409-W	N	Y	N	N	N	N
KAVL19410-W	N	Y	N	N	N	N
KAVL19411-W	N	Y	N	N	N	N
KAVL19600-E	N	Y	N	N	N	N
KAVL19601-E	Y	Y	N	N	N	N
KAVL19602-E	Y	Y	N	N	N	N
KAVL19603-E	Y	Y	N	N	N	N
KAVL19604-E	Y	Y	N	N	N	N
KAVL19606-E	Y	Y	N	N	N	N
KAVL19607-E	Y	Y	N	N	N	N
KAVL19608-E	N	Y	N	N	N	N
KAVL19609-E	Y	Y	N	N	N	N
KAVL19610-E	Y	Y	N	N	Y	N
KAVL19611-E	Y	Y	N	N	N	N
KAVL19612-E	Y	Y	N	N	N	N
KAVL19613-E	Y	Y	N	N	N	N

Message ID	Output destination					
	Windows event log	Common message log	Agent log		JP1 system event[#1]	Agent event[#2]
			Normal log	Error log		
KAVL19614-E	N	Y	N	N	N	N
KAVL19700-E	N	Y	N	N	N	N
KAVL19800-I	N	N	Y	N	N	N
KAVL19801-I	N	N	Y	N	N	N
KAVL19802-I	N	N	Y	N	N	N
KAVL19803-I	N	N	Y	N	N	N
KAVL19804-I	N	N	Y	N	N	N
KAVL19805-I	N	N	Y	N	N	N
KAVL19806-I	N	N	Y	N	N	N
KAVL19807-I	N	N	Y	N	N	N
KAVL19808-I	N	N	Y	N	N	N
KAVL19809-I	N	N	Y	N	N	N
KAVL19810-E	N	N	N	Y	N	N
KAVL19811-E	N	N	N	Y	N	N
KAVL19812-E	N	N	N	Y	N	N
KAVL19813-E	N	Y	N	Y	N	N
KAVL19815-E	N	N	N	Y	N	N
KAVL19816-E	N	N	N	Y	N	N
KAVL19817-W	N	N	N	Y	N	N
KAVL19818-I	N	N	Y	N	N	N
KAVL19819-I	N	N	Y	N	N	N
KAVL19820-E	N	N	N	Y	N	N
KAVL19821-W	N	N	N	Y	N	N
KAVL19822-W	N	N	N	Y	N	N
KAVL19823-I	N	N	Y	N	N	N
KAVL19824-E	N	N	N	Y	N	N
KAVL19825-I	N	N	Y	N	N	N
KAVL19826-E	N	N	N	Y	N	N
KAVL19827-I	N	N	Y	N	N	N
KAVL19829-W	N	N	N	Y	N	N
KAVL19830-W	N	N	N	Y	N	N
KAVL19831-W	N	N	N	Y	N	N
KAVL19834-E	N	N	N	Y	N	N

Message ID	Output destination					
	Windows event log	Common message log	Agent log		JP1 system event#1	Agent event#2
			Normal log	Error log		
KAVL19835-E	N	N	N	Y	N	N
KAVL19836-E	N	N	N	Y	N	N
KAVL19838-E	N	N	N	Y	N	N
KAVL19839-E	N	N	N	Y	N	N
KAVL19840-E	N	N	N	Y	N	N
KAVL19841-E	N	N	N	Y	N	N
KAVL19842-E	N	N	N	Y	N	N
KAVL19843-E	N	N	N	Y	N	N
KAVL19844-E	N	N	N	Y	N	N
KAVL19845-I	N	Y	N	N	N	N
KAVL19846-W	N	N	N	Y	N	N
KAVL19847-I	N	N	Y	N	N	N
KAVL19848-E	N	N	N	Y	N	N
KAVL19849-W	N	N	N	Y	N	N
KAVL19852-W	N	N	N	Y	N	N

#1

JP1 system events are the events to notify JP1/IM of status change of the agent. For details about JP1 system events, see the chapter on how to coordinate Performance Management programs and JP1/IM programs and conduct operation monitoring in the *Job Management Partner 1/Performance Management User's Guide*.

Table 6-2: Prerequisite programs to issue JP1 system events

Hosts	Prerequisite program	Version
PFM - Manager host	PFM - Manager	09-00 or later
PFM - Web Console host	PFM - Web Console	08-00 or later
PFM - RM host	PFM - RM for Microsoft SQL Server	09-00 or later
	PFM - Manager or PFM - Base	09-00 or later
	JP1/Base	08-50 or later

#2

Agent events are the events to notify PFM - Manager of status change of the agent. For details about agent events, see the chapter on displaying the events in the *Job Management Partner 1/Performance Management User's Guide*.

Table 6-3 shows the prerequisite programs to issue agent events

Table 6-3: Prerequisite programs to issue agent events

Hosts	Prerequisite programs	Version
PFM - Manager host	PFM - Manager	09-00 or later
PFM - Web Console host	PFM - Web Console	08-00 or later
PFM - RM host	PFM - Manager or PFM - Base	09-00 or later

6.3 Messages output to the Windows event log

This section lists the messages that PFM - RM for Microsoft SQL Server outputs to the Windows event log.

The Windows event log is displayed as the application log in the Event Viewer window.

Reference note:

To open the Event Viewer window, from the Windows **Start** menu, select **Administrative Tools** and then **Event Viewer**.

An event issued by PFM - RM for Microsoft SQL Server is indicated in the **Source** column of the Event Viewer window by the identifier `PFM-RMSQLServr`.

Table 6-4 lists the messages that PFM - RM for Microsoft SQL Server outputs to the Windows event log.

Table 6-4: Messages output to the Windows event log

Message ID	Windows event log	
	Event ID	Type
KAVL19001-I	19001	Information
KAVL19002-E	19002	Error
KAVL19003-I	19003	Information
KAVL19004-E	19004	Error
KAVL19601-E	19601	Error
KAVL19602-E	19602	Error
KAVL19603-E	19603	Error
KAVL19604-E	19604	Error
KAVL19605-E	19605	Error
KAVL19606-E	19606	Error
KAVL19607-E	19607	Error
KAVL19609-E	19609	Error
KAVL19610-E	19610	Error
KAVL19611-E	19611	Error
KAVL19612-E	19612	Error
KAVL19613-E	19613	Error

6.4 Messages

This section explains the messages issued by PFM - RM for Microsoft SQL Server, and the corresponding actions to be taken. The individual messages issued by PFM - RM for Microsoft SQL Server are explained as follows.

KAVL19001-I

`Remote Monitor Collector has stopped. (host=`*host-name*`, service=`*service-ID*`)`

Remote Monitor Collector service stopped normally.

(S)

Stops Remote Monitor Collector service processing.

KAVL19002-E

`Remote Monitor Collector has failed to start.`

Remote Monitor Collector service startup failed.

(S)

Stops Remote Monitor Collector service processing.

(O)

Check the immediately preceding message that was issued to the common message log and take appropriate action.

KAVL19003-I

`Remote Monitor Collector has started. (host=`*host-name*`, service=`*service-ID*`)`

Remote Monitor Collector service startup was completed.

(S)

Starts Remote Monitor Collector service performance data collection processing.

KAVL19004-E

`Remote Monitor Collector has stopped abnormally.`

Remote Monitor Collector service stopped abnormally.

(S)

Stops Remote Monitor Collector service processing.

(O)

Check the immediately preceding message that was output to the event log and common message log and take appropriate action.

KAVL19200-I

`The connection to the SQL Server has been recovered.`

Connection to Microsoft SQL Server was recovered during record collection processing.

(S)

Continues Remote Monitor Collector service record collection processing.

KAVL19400-W

`An attempt to connect to the SQL Server has failed.`

A connection to the monitoring target Microsoft SQL Server could not be established.

(S)

Continues Remote Monitor Collector service processing.

(O)

Ensure that the Microsoft SQL Server has been started. Also ensure that the following items entered during the creation of the monitoring target were correct:

- `SQL_INSTANCE` (*Microsoft SQL Server instance name*)
- `TARGET_HOST` (*monitored host-name*)
- `SQL_USER` (*user-name*)
- `SQL_PASSWORD` (*password)*

If it is incorrect, update the monitoring target by specifying the correct information.

KAVL19401-W

`Data collection for` *record-name* `has failed.`

The data necessary for creating the record indicated by *record-name* could not be collected.

(S)

Continues Remote Monitor Collector service processing.

(O)

If this message is continuously output, ensure that the system environment settings for the monitoring target system are correct. If you cannot determine the cause of the problem, collect maintenance information and contact the system administrator. For details about how to collect maintenance information, see the chapter that describes troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

KAVL19403-W

`Remote Monitor Collector has failed to open registry key` *registry-name*`, with error code` *maintenance-code*.

An attempt to open the registry indicated by *registry-name* failed. *maintenance-code* is a Win32 system error code.

(S)

Continues Remote Monitor Collector service processing.

(O)

Ensure that the OS resource is sufficient and that no error has occurred in the OS itself.

KAVL19404-W

`Remote Monitor Collector has failed to get the value of registry key` *registry-name*`, with error code` *maintenance-code*.

An attempt to load the registry indicated by *registry-name* failed. *maintenance-code* is a Win32 system error code.

(S)

Continues Remote Monitor Collector service processing.

(O)

Ensure that Microsoft SQL Server has been installed correctly and that no error has occurred in the OS itself.

KAVL19405-W

`No entry for` *setting-item* `in the service startup initialization file. The default value is` *default-value*.

The value indicated by *setting-item* could not be obtained from the service startup initialization file.

(S)

Uses the default value for the setting item.

(O)

On the **Agents** page of PFM - Web Console, make sure that the items under **Agent Configuration** are set correctly as agent properties.

KAVL19409-W

`Agent property` *setting-item* `has been set to the minimum value` *minimum-value* `since the specified value exceeded the lower limit of the property.`

Because a value smaller than the range of specifiable values was specified as an Remote Monitor Collector property, the allowed minimum value was set.

(S)

Ignores the specified value, sets the minimum value, and continues processing.

(O)

Check whether the specified value is acceptable. If it is not, re-specify an appropriate value.

KAVL19410-W

`Agent property` *setting-item* `has been set to the maximum value` *maximum-value* `since the specified value exceeded the upper limit of the property.`

Because a value greater than the range of specifiable values was specified as an Agent property, the allowed maximum value was set.

(S)

Ignores the specified value, sets the maximum value, and continues processing.

(O)

Check whether the specified value is acceptable. If it is not, re-specify an appropriate value.

KAVL19411-W

`A non-numeral character is specified to the Agent property field.`

Because a non-numerical value was specified in the Agent property field that requires a numerical value, the item value could not be updated.

(S)

Ignores the specified value and continues processing using the existing value.

(O)

Make sure that only a numerical value is specified.

KAVL19600-E

`Initialization of the trace log is failed due to:` *cause*

An attempt to initialize log output processing failed.

(S)

Stops Remote Monitor Collector service processing.

(O)

Ensure that no error has occurred in the OS itself.

KAVL19601-E

`Initialization of Remote Monitor Collector has failed.`

The service startup initialization file could not be loaded during Remote Monitor Collector service startup processing.

(S)

Stops Remote Monitor Collector service processing.

(O)

Ensure that the service startup initialization file (`jpcagt.ini`) is located under *installation-folder* `\agt4\agent\`*instance-name*.

KAVL19602-E

`No entry for the SQL Server instance name in the target information file.`

The instance name of the monitoring target Microsoft SQL Server could not be obtained from the target information file during Remote Monitor Collector service startup processing.

(S)

Stops Remote Monitor Collector service processing.

(O)

Check whether the following item specified during setup of the monitoring target is correct:

- `SQL_INSTANCE` (*Microsoft SQL Server instance name*)

If it is incorrect, update the monitoring target by specifying the correct information.

KAVL19603-E

`No login ID for instance` *instance-name* `in the target information file.`

The account name (user name) of the monitoring target Microsoft SQL Server could not be obtained from the target information file during Remote Monitor Collector service startup processing.

(S)

Stops Remote Monitor Collector service processing.

(O)

Check whether the following item specified during setup of the monitoring target is correct:

- `SQL_USER` (*user-name*)

If it is incorrect, update the monitoring target by specifying the correct information.

KAVL19604-E

`No password entry for instance` *instance-name* `in the target information file.`

The password for the monitoring target Microsoft SQL Server could not be obtained from the target information file during Remote Monitor Collector service startup processing.

(S)

Stops Remote Monitor Collector service processing.

(O)

Check whether the following item specified during setup of the monitoring target is correct:

- `SQL_PASSWORD` (*password*)

If it is incorrect, update the monitoring target by specifying the correct information.

KAVL19606-E

`An error occurred during initialization of the SQL Server API.`

An attempt to initialize the database access API failed.

(S)

Stops Remote Monitor Collector service processing.

(O)

Ensure that no error has occurred in the OS itself.

KAVL19607-E

`Initialization of TCP/IP has failed, with error code` *maintenance-code*.

Initialization of TCP/IP failed during Remote Monitor Collector service startup processing.

(S)

Stops Remote Monitor Collector service processing.

(O)

Ensure that the network settings are correct.

KAVL19608-E

`The execution of the SQL query has failed, with error code` *maintenance-code*.

Execution of SQL query failed during data collection.

(S)

Continues Remote Monitor Collector service processing.

(O)

If this message is continuously output, ensure that the system environment settings for the monitoring target system are correct. If you cannot determine the cause of the problem, collect maintenance information and contact the system administrator.

For details about how to collect maintenance information, see the chapter that describes troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

KAVL19609-E

`No host name for instance` *instance-name* `in the target information file.`

The host name of the monitoring target Microsoft SQL Server could not be obtained from the target information file during Remote Monitor Collector service startup processing.

(S)

Stops Remote Monitor Collector service processing.

(O)

Check whether the following item specified during setup of the monitoring target is correct:

- `TARGET_HOST` (*monitored host-name*)

If it is incorrect, update the monitoring target by specifying the correct information.

KAVL19610-E

`Remote Monitor Collector could not connect to the SQL Server due to the SQL Server Authentication failure.`

Connection to the Microsoft SQL Server could not be established using the SQL Server authentication mode.

(S)

Stops Remote Monitor Collector service processing.

(O)

Check whether the following item specified during setup of the monitoring target is correct:

- `SQL_INSTANCE` (*Microsoft SQL Server instance name*)
- `TARGET_HOST` (*monitored host-name*)
- `SQL_USER` (*user-name*)
- `SQL_PASSWORD` (*password)*

If it is incorrect, update the monitoring target by specifying the correct information.

KAVL19611-E

`Remote Monitor Collector could not connect to the SQL Server due to the Windows Authentication failure.`

Connection to the Microsoft SQL Server could not be established using the Windows authentication mode.

(S)

Stops Remote Monitor Collector service processing.

(O)

Check whether the following item specified during setup of the monitoring target is correct:

- `SQL_INSTANCE` (name of the Microsoft SQL Server instance)
- `TARGET_HOST` (*monitored host-name*)
- `SQL_USER` (name of the Microsoft SQL Server user)

If it is incorrect, update the monitoring target by specifying the correct information.

Check also whether the login account you specified for the Remote Monitor Collector service can successfully log in to the monitoring target host.

If the account you specified fails to log in, specify the other account that can successfully log in and then restart the Remote Monitor Collector service.

KAVL19612-E

`While executing` *function-name* `function` *called-function-name* `failed.`

An error occurred during the execution of the function indicated by *function-name*.

(S)

Stops Remote Monitor Collector service processing.

(O)

Collect maintenance information and contact the system administrator. For details about how to collect maintenance information, see the chapter that describes troubleshooting in the *Job Management Partner 1/ Performance Management User's Guide*.

KAVL19613-E

"*exception-name*" `exception raised. (details = "`*detailed-information*`")`

The *exception-name* exception occurred.

(S)

Stops Remote Monitor Collector service processing.

(O)

Collect maintenance information and contact the system administrator. For details about how to collect maintenance information, see the chapter that describes troubleshooting in the *Job Management Partner 1/ Performance Management User's Guide*.

KAVL19614-E

`Failed to output to Agent log. "`*OS-function*`" failed. Error code = "`*error-code*`"`

An attempt to output information to the agent log has failed. The OS function indicated by *OS-function* failed due to the error indicated by *error-code*.

(S)

Continues Remote Monitor Collector service processing. The system stops collecting agent log information until the error has been corrected.

(O)

Check the destination path, access permissions, and other information related to the agent log.

KAVL19700-E

`Memory allocation for object` *object-name* `has failed.`

An attempt to allocate memory for the object indicated by *object-name* failed.

(S)

Stops Remote Monitor Collector service processing.

(O)

Increase the available memory.

KAVL19800-I

`Server: "`*computer-name*`", User: "`*user-name*`"`

The system will log information that the Remote Monitor Collector service sends to Microsoft SQL Server.

(S)

Starts Remote Monitor Collector service processing.

KAVL19801-I

`Remote Monitor Collector started : "`*status*`"`

The Remote Monitor Collector service is being started. One of the following character strings is set in *status*:

- Now starting
- TCP/IP Initialization Successful
- Initializing

(S)

Starts the Remote Monitor Collector service.

KAVL19802-I

`Remote Monitor Collector ended.`

The Remote Monitor Collector service is being terminated.

(S)

Terminates the Remote Monitor Collector service.

KAVF1803-I

`Records collection started.`

Record collection started.

(S)

Starts record collection processing by the Remote Monitor Collector service.

KAVL19804-I

`Connection to SQL Server started. Authentication : "`*authentication-method*`"`

Connection to Microsoft SQL Server will start.

(S)

Starts processing to connect to Microsoft SQL Server.

KAVL19805-I

`Connection to SQL Server ended normally.`

Connection to Microsoft SQL Server has been completed.

(S)

Completes connection to Microsoft SQL Server, and continues processing.

KAVL19806-I

`The process of the record started = "`*record-name*`"`

Processing of the record indicated by *record-name* will start.

(S)

Starts processing of the indicated record by the Remote Monitor Collector service.

KAVL19807-I

`Getting record ended = "`*record-name*`" -> Storing started [ count = "`*number-of-records*`" ]`

Collection of data for the record indicated by *record-name* terminated.

(S)

Terminates collection of data for the indicated record, and starts saving the data in the Stored database.

KAVL19808-I

`The Process of the record ended = "`*record-name*`"`

Processing of the record indicated by *record-name* will terminate.

(S)

Terminates processing of the indicated record by the Remote Monitor Collector service.

KAVL19809-I

`Records collection ended.`

Record collection terminated.

(S)

Terminates record collection processing by the Remote Monitor Collector service.

KAVL19810-E

`An attempt to connect to SQL Server failed. ("`*Microsoft-SQL-Server-detailed-error-information*`")`

An error occurred during an attempt to connect to Microsoft SQL Server. The Microsoft SQL Server detailed error information is an error code returned by Microsoft SQL Server. If Microsoft SQL Server also returns a message for the error code, the message is also displayed.

(S)

Continues Remote Monitor Collector service processing.

(O)

Ensure that the Microsoft SQL Server has been started. Also ensure that the following items entered during the creation of the monitoring target were correct:

- `TARGET_HOST` (*monitored host-name*)
- `SQL_INSTANCE` (*Microsoft SQL Server instance name*)
- `SQL_USER` (*user-name*)
- `SQL_PASSWORD` (*password)*

If it is incorrect, update the monitoring target by specifying the correct information.

If all items specified during setup of Microsoft SQL Server are correct, correct the error indicated by the error code. For details about Microsoft SQL Server error codes, see your Microsoft SQL Server documentation.

KAVL19811-E

`An error occurred in OS function "`*Win32-API-function-name*`". (rc = "`*maintenance-code*`")`

An error occurred in the function indicated by *Win32-API-function-name*. *maintenance-code* is a Win32 system error code.

(S)

Stops Remote Monitor Collector service processing.

(O)

Ensure that the OS resource is sufficient and that no error has occurred in the OS itself. If this message is continuously output, ensure that the system environment settings for the monitoring target system are correct. If you cannot determine the cause of the problem, collect maintenance information and contact the system administrator.

For details about how to collect maintenance information, see the chapter that describes troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

KAVL19812-E

SQL Server(ADO)returned an error.
(rc = "*Microsoft-SQL-Server-error-code*", msg = "*Microsoft-SQL-Server-error-message*")

An error was returned when an attempt was made to access Microsoft SQL Server.

(S)

Continues Remote Monitor Collector service processing.

(O)

Make sure that Microsoft SQL Server is started, and correct the error indicated by *Microsoft-SQL-Server-error-code*. If Microsoft SQL Server has also returned an error message for the error mode, the error message is also output.

For details about Microsoft SQL Server error codes, see your Microsoft SQL Server documentation.

KAVL19813-E

SQL Server(ADO)returned an error. (rc = "*Microsoft-SQL-Server-error-code*", method = "*ADO-method-name*", msg = "*Microsoft-SQL-Server-error-message*")

An error was returned when an attempt was made to access Microsoft SQL Server via ADO (Microsoft ActiveX data object).

(S)

Continues Remote Monitor Collector service processing.

(O)

Make sure that Microsoft SQL Server is started, and correct the error indicated by *Microsoft-SQL-Server-error-code*. If Microsoft SQL Server has also returned an error message for the error mode, the error message is also output.

For details about Microsoft SQL Server error codes, see your Microsoft SQL Server documentation.

KAVL19815-E

An error occurred: "*error-details*"

An error occurred during Remote Monitor Collector service processing.

(S)

Stops Remote Monitor Collector service processing.

(O)

Ensure that the OS resource is sufficient and that no error has occurred in the OS itself. If this message is continuously output, ensure that the system environment settings for the monitoring target system are correct. If you cannot determine the cause of the problem, collect maintenance information and contact the system administrator.

For details about how to collect maintenance information, see the chapter that describes troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

KAVL19816-E

An exception occurred: "*exception-error-details*"

An exception error occurred during Remote Monitor Collector service processing.

(S)

Continues Remote Monitor Collector service processing.

(O)

Ensure that the OS resource is sufficient and that no error has occurred in the OS itself. If this message is continuously output, ensure that the system environment settings for the monitoring target system are correct. If

you cannot determine the cause of the problem, collect maintenance information and contact the system administrator.

For details about how to collect maintenance information, see the chapter that describes troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

KAVL19817-W

`A warning-level error occurred: "`*warning-error-details*`"`

A warning error occurred during Remote Monitor Collector service processing.

(S)

Continues Remote Monitor Collector service processing.

(O)

Check the following items:

- OS resources are sufficient.
- No errors have occurred anywhere in the OS.
- The system environment settings of the monitoring target are correct.

KAVL19818-I

`Process "`*process-name*`" started.`

The Remote Monitor Collector service started the process indicated by *process-name*.

(S)

The Remote Monitor Collector service started the process indicated by *process-name*.

KAVL19819-I

`Process "`*process-name*`" ended.`

The Remote Monitor Collector service terminated the process indicated by *process-name*.

(S)

The Remote Monitor Collector service terminated the process indicated by *process-name*.

KAVL19820-E

`Process "`*process-name*`" failed.`

The Remote Monitor Collector service detected an error in the process indicated by *process-name*.

(S)

Continues Remote Monitor Collector service processing.

KAVL19821-W

`The value of the agent property "`*property-name*`" is either invalid or outside the allowable range. (Allowable range: "`*range-value*`")`

An invalid value or a value outside the allowable range is specified for the Remote Monitor Collector service property indicated by *property-name*.

(S)

Ignores the specified value and continues processing. The value is not changed.

(O)

Check whether the specified value is the cause of the problem. If it is, change the value to an appropriate one.

KAVL19822-W

`Connection to SQL Server will be retried.`

Because an attempt to connect to Microsoft SQL Server failed, connection to Microsoft SQL Server will be retried.

(S)

Retries connection to Microsoft SQL Server.

KAVL19823-I

`Remote Monitor Collector has stopped. (host=`*host-name*`, service=`*host-name*`<SQL>)`

Remote Monitor Collector service stopped normally.

(S)

Stops Remote Monitor Collector service processing.

KAVL19824-E

`Remote Monitor Collector has failed to start.`

Remote Monitor Collector service startup failed.

(S)

Stops Remote Monitor Collector service processing.

(O)

Check the immediately preceding message that was issued to the common message log and take appropriate action.

KAVL19825-I

`Remote Monitor Collector has started. (host=`*host-name*`, service=`*host-name*`<SQL>)`

Remote Monitor Collector service startup was completed.

(S)

Starts Remote Monitor Collector service performance data collection processing.

KAVL19826-E

`Remote Monitor Collector has stopped abnormally.`

Remote Monitor Collector service stopped abnormally.

(S)

Stops Remote Monitor Collector service processing.

(O)

Check the immediately preceding message that was output to the event log and common message log and take appropriate action.

KAVL19827-I

`The connection to the SQL Server has been recovered.`

Connection to Microsoft SQL Server was recovered during record collection processing.

(S)

Continues Remote Monitor Collector service record collection processing.

KAVL19829-W

`Remote Monitor Collector has failed to open registry key` *registry-name*`, with error code` *maintenance-code*.

An attempt to open the registry indicated by *registry-name* failed. *maintenance-code* is a Win32 system error code.

(S)

Continues Remote Monitor Collector service processing.

(O)

Ensure that the OS resource is sufficient and that no error has occurred in the OS itself.

KAVL19830-W

`Remote Monitor Collector has failed to get the value of registry key` *registry-name*`, with error code` *maintenance-code*.

An attempt to load the registry indicated by *registry-name* failed. *maintenance-code* is a Win32 system error code.

(S)

Continues Remote Monitor Collector service processing.

(O)

Ensure that Microsoft SQL Server has been installed correctly and that no error has occurred in the OS itself.

KAVL19831-W

`No entry for` *setting-item* `in the target information file. The default value is` *default-value*.

The value indicated by *setting-item* could not be obtained from the target information file.

(S)

Uses the default value for the setting item.

(O)

On the **Agents** page of PFM - Web Console, make sure that the items under **Agent Configuration** are set correctly as agent properties.

KAVL19834-E

`Initialization of the trace log is failed due to:` *cause*

An attempt to initialize log output processing failed.

(S)

Stops Remote Monitor Collector service processing.

(O)

Ensure that no error has occurred in the OS itself.

KAVL19835-E

`No login ID for instance` *instance-name* `in the target information file.`

The account name (user name) of the monitoring target Microsoft SQL Server could not be obtained from the target information file during Remote Monitor Collector service startup processing.

(S)

Stops Remote Monitor Collector service processing.

(O)

Check whether the following item specified during setup of the monitoring target is correct:

- `SQL_USER` (*user-name*)

If it is incorrect, update the monitoring target by specifying the correct information.

KAVL19836-E

`No password entry for instance` *instance-name* `in the target information file.`

The password for the monitoring target Microsoft SQL Server could not be obtained from the target information file during Remote Monitor Collector service startup processing.

(S)

Stops Remote Monitor Collector service processing.

(O)

Check whether the following item specified during setup of the monitoring target is correct:

- `SQL_PASSWORD` (*password*)

If it is incorrect, update the monitoring target by specifying the correct information.

KAVL19838-E

`Initialization of TCP/IP has failed, with error code` *maintenance-code*.

Initialization of TCP/IP failed during Remote Monitor Collector service startup processing.

(S)

Stops Remote Monitor Collector service processing.

(O)

Ensure that the network settings are correct.

KAVL19839-E

`The execution of the SQL query has failed, with error code` *maintenance-code*.

Execution of SQL query failed during data collection.

(S)

Continues Remote Monitor Collector service processing.

(O)

If this message is continuously output, ensure that the system environment settings for the monitoring target system are correct. If you cannot determine the cause of the problem, collect maintenance information and contact the system administrator.

For details about how to collect maintenance information, see the chapter that describes troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

KAVL19840-E

`No host name for instance` *instance-name* `in the target information file.`

The host name of the monitoring target Microsoft SQL Server could not be obtained from the target information file during Remote Monitor Collector service startup processing.

(S)

Stops Remote Monitor Collector service processing.

(O)

Check whether the following item specified during setup of the monitoring target is correct:

- `TARGET_HOST` (*monitored host-name*)

If it is incorrect, update the monitoring target by specifying the correct information.

KAVL19841-E

`While executing` *function-name* `function` *called-function-name* `failed.`

An error occurred during the execution of the function indicated by *function-name*.

(S)

Stops Remote Monitor Collector service processing.

(O)

Collect maintenance information and contact the system administrator. For details about how to collect maintenance information, see the chapter that describes troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

KAVL19842-E

"*exception-name*" `exception raised. (details = "`*detailed-information*`")`

An *exception-name* exception occurred.

(S)

Stops Remote Monitor Collector service processing.

(O)

Collect maintenance information and contact the system administrator. For details about how to collect maintenance information, see the chapter that describes troubleshooting in the *Job Management Partner 1/ Performance Management User's Guide*.

KAVL19843-E

`Memory allocation for object` *object-name* `has failed.`

An attempt to allocate memory for the object indicated by *object-name* failed.

(S)

Stops Remote Monitor Collector service processing.

(O)

Increase the available memory.

KAVL19844-E

`The version of target SQL Server is not supported. (Ver= "`*version-of-target-SQL-Server*`")`

The specified Microsoft SQL Server version is not supported.

(S)

Stops Remote Monitor Collector service processing.

(O)

Make sure that PFM - RM for Microsoft SQL Server supports the version of the monitored Microsoft SQL Server.

KAVL19845-I

`Agent log. path = "`*agent-log-output-folder-path*`"`

The path to the agent log output folder for the Remote Monitor Collector service is recorded.

(S)

Continues Remote Monitor Collector service processing.

KAVL19846-W

`Getting record error ("`*record-name*`"). This record is only in drilldown reports.`

The record indicated by *record-name* could not be acquired. This record is available only in drilldown reports.

(S)

Continues Remote Monitor Collector service processing.

(O)

Set a drilldown report that is associated with the record that has the specific ODBC key for the record indicated by *record-name*. For details about drilldown reports, see the chapter on creating reports used for operation analysis in the *Job Management Partner 1/Performance Management User's Guide*.

KAVL19847-I

`Because the fact that free space size rate(percent) of the database is smaller than 0 percent is inspected, size rate was revised. before = ("`*percentage-of-free-space-before-setup*`"): after = ("`*percentage-of-free-space-after-setup*`"): dbname= ("`*database-name*`").`

Because the percentage of free space in the database is less than 0, the value for free space percentage is set to the value of `DB_FREE_PERC_NUMBER` that was specified when the `jpcconf inst setup` command was executed.

(S)

Continues processing the Remote Monitor Collector service.

KAVL19848-E

`The target is modified or deleted.`

`jpcconf target setup` command modifies or deletes the monitoring target.

(S)

Stops Remote Monitor Collector service processing.

(O)

To restart collecting the performance information, restart the PFM - RM for Microsoft SQL Server service.

KAVL19849-W

`The specified number of maximum collection records was exceeded.`

The specified maximum number of collection records has been exceeded.
(record="*record-name*", maximum number="*maximum-number-of-collection-records*")

(S)

Collects data until the maximum number of collection records is reached, and then continues Remote Monitor Collector service processing.

KAVL19852-W

`An attempt to connect to SQL Server failed, when PD_IA record is collected. ("`*Microsoft-SQL-Server-detailed-error-information*`")`

An attempt to connect to the SQL Server failed when the PD_IA record was collected. ("*Microsoft-SQL-Server-error-details*")

(S)

Continues Remote Monitor Collector service processing.

(O)

If the monitored host is a Microsoft SQL Server, check the startup status of the monitored host.

7 Error Handling Procedures

This chapter describes how to troubleshoot problems in Performance Management operation, focusing mainly on problems that occur in PFM - RM for Microsoft SQL Server. For details about how to deal with issues affecting the Performance Management system as a whole, see the chapter on troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

7.1 When an error occurs

If an error occurs in Performance Management, follow the steps below.

Check events

Check the following:

- What events occur when the problem is encountered
- The content of messages (if output)
- Log information such as the common message log

For details about the causes of messages and the action to take, see *6. Messages* For details about the logs that are output by Performance Management, see *7.3 Log information*.

Collect data

You need to collect data to determine the cause of the problem. See *7.4 Required troubleshooting information* and *7.5 Collecting troubleshooting information* to collect the necessary information.

Investigate the problem

Identify the cause of the problem based on the collected data. Isolate the problem or all the areas affected by the problem.

7.2 Troubleshooting procedures

This section describes how to troubleshoot Performance Management. If a problem occurs while you are using Performance Management, first check for any of the events described in this section.

The following table shows the main types of problems that may occur in Performance Management.

Table 7-1: Table Problems that occur in Performance Management

Category	Description	Reference
Problems relating to the start and setup of services	• A Performance Management program service does not start. • There is a delay from the time the start request is issued until the service starts. • Communication fails when a second program starts a service immediately after a Performance Management program service is stopped. • The following message is output and the Master Store or Remote Monitor Store service stops: `The disk capacity is insufficient.` • The PFM - RM Remote Monitor Collector service does not start.	*7.2.1*
Problems relating to command execution	• The name of an inactive service is output when you execute the `jpctool service list` command. • The data output by the `jpctool db dump` command is not the Store data you specified.	*7.2.2*
Problems relating to report definitions	• During a certain period, the collected data is not shown in the historical report.	*7.2.3*
Problems relating to alarm definitions	• A program defined in an action does not operate correctly. • Alarm events are not displayed. • Although the alarm threshold has been exceeded, the color of the alarm icon shown in the Alarm Status window of the **Agents** tree remains green.	*7.2.4*
Problems relating to collection and management of performance data	• The PFM - RM for Microsoft SQL Server Store database remains large despite setting a short retention period. • The following message is output to the common message log: `Illegal data was detected in the Store database.` • Performance data is not collected after PFM - RM for Microsoft SQL Server startup.	*7.2.5*

7.2.1 Problems relating to the start and setup of services

This subsection describes how to correct errors related to the start and setup of services.

(1) Performance Management program service does not start

Potential causes and actions to take are as follows:

- *PFM - Manager is not running*
  If PFM - Manager and PFM - RM for Microsoft SQL Server are installed on the same host, PFM - Manager must be running before the PFM - RM for Microsoft SQL Server service can start. Check that the PFM - Manager service is running and start it if not. For details about how to start services, see the chapter on starting and stopping Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.
- *The same port number is assigned to multiple services of Performance Management programs*

You will be unable to start a Performance Management service if it is assigned the same port number as another Performance Management service. By default, port numbers are allocated automatically. This prevents the same port number from being assigned more than once. If you specified fixed port numbers for services of Performance Management programs during Performance Management setup, check the settings you made. If you assigned the same port number to more than one service of Performance Management programs, assign a different port number to each service. For details about setting port numbers, see the chapter on installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

- *The storage directories for the Store database are set incorrectly*

  A Remote Monitor Store service cannot start if any of the following directories are nonexistent or inaccessible. Check the directory names and attributes, and fix any errors.

  - Store database storage destination directory
  - Store database backup destination directory
  - Store database partial backup destination directory
  - Store database export destination directory
  - Store database import destination directory

  Also, the service cannot start if the same directories are assigned to multiple Remote Monitor Store services. Check the directory settings, and fix any errors.

- *An unspecified method was used to change a machine's host name*

  For details about how to change a machine's host name, see the chapter on installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*. If you change a host name using a method other than that specified in the manual, Performance Management services may not start.

- *An error occurred in the service control manager*

  When you execute the `jpcspm start` command in Windows, occasionally the system outputs the following message and fails to start the service: `An error occurred in the Windows service control manager`. In this case, re-execute the `jpcspm start` command. If this problem occurs frequently, you can change the number of retries and the retry interval for when the system fails to start a service by editing the `jpccomm.ini` file. For details about changing the number of retries and the retry interval, see the chapter on starting and stopping Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

(2) There is a delay from the time the start request is issued until the service starts

Occasionally, you may experience a delay after executing the `jpcspm start` command or clicking an icon in the Services window until the service actually starts. If this delay is caused by one of the following, the service will start more quickly next time.

- If you do not set the service to stop automatically when the system shuts down, the system may need to rebuild the Store database when you start the service after restarting the system. This may cause a delay in starting the service.
- When you start the service for the first time after adding a new instance, an index is created for the Store database. This may cause a delay in starting the service.
- If the Store service was unable to complete shutdown processing because the system was powered off, for example, the system will rebuild the index of the Store database the next time the Store service is started. This may cause a delay in starting the Store service.

(3) Communication fails when a second program starts a service immediately after a Performance Management program service is stopped

If another program starts a service that uses the same port number as a Performance Management program service that has recently stopped, communication may not be performed correctly. To prevent this from occurring, perform either of the following settings:

- Use a fixed port number for the Performance Management program service

  Assign fixed port numbers to Performance Management program services. For details about how to set port numbers, see the chapter on installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

- Set the `TCP_TIMEWAIT` value

  Use the `TCP_TIMEWAIT` option to specify how much time must elapse before a connection is closed.

  In Windows, use the default connection wait time. The respective default values are as follows:

  - In Windows Server 2003 and Windows Server 2008 : 2 minutes

(4) The following message is output and the Master Store service or Remote Monitor Store service stops: "The disk capacity is insufficient"

The system will stop recording data in the Store database if there is not enough space on the disk used by the database. In this case, the following message is output and the Master Store or Remote Monitor Store service stops: `The disk capacity is insufficient.`

If this message appears, take one of the following actions:

- Ensure that sufficient disk space is available

  Estimate the disk space requirements of the Store database, and change the storage location of the Store database to a disk that has sufficient free space. For details about how to estimate the disk space requirements of the Store database, see *A. Estimating System Requirements*. For details about how to change the location of the Store database, see *2.4.1 Changing the storage location of performance data*.

- Change the data retention conditions of the Store database

  Change the data retention conditions of the Store database to adjust the maximum amount of data that can be stored in the Store database. For details about how to change the data retention conditions, see the chapter on management of operation monitoring data in the *Job Management Partner 1/Performance Management User's Guide*.

If the Master Store service or Remote Monitor Store service still does not start, an unrecoverable logic conflict has occurred in the Store database. In this case, restore the Store database from backup data, and then start the Master Store or Remote Monitor Store service. If no backup data is available, initialize the Store database and then start the Master Store or Remote Monitor Store service. You can initialize the Store database by deleting the following files from the Store database's storage directory:

- Files with the extension `.DB`
- Files with the extension `.IDX`

For details about the storage directory of the Store database, see *2.4.1 Changing the storage location of performance data*.

(5) The PFM - RM Remote Monitor Collector service does not start

For the PFM - RM host running in Windows, the Remote Monitor Collector service fails to start when PFM - RM is started, and either of the following messages is output to the Windows event log when Windows is restarted.

- `The` *service-name* `service stops at the startup.`
- `The` *service-name* `service is hung up at the start.`

Because this failure is due to the Windows service control manager timing out, the failure tends to occur when the communication load with PFM - Manager is high, and too much time is required to receive a response from PFM - Manager. This problem occurs when all the following conditions exist.

- The load from communication with JP1/PFM - Manager is high.

  For example, this condition can arise when multiple PFM - RM startup processes are being executed simultaneously.

- In the **Services** applet of Windows, **Startup Type** of each PFM - RM service is set to **Automatic**.
- The OS is restarted.

You can use either of the following operational techniques to avoid this problem:

- If you start a service at the same time you restart the OS, do so by executing the `jpcspm start` command instead of starting the service from the Windows service control manager.

- Specify the following settings on the PFM - RM host to reduce the startup time of PFM - RM.
  These settings reduce reconnection processing when connection to PFM - Manager cannot be established at PFM - RM service startup. In this case, the PFM - RM service tends to start in stand-alone mode.
  To reduce the startup time of PFM - RM, change the `NS Init Retry Count` label of `Agent Collector` *x* `Section`[#] and `Agent Store` *x* `Section`[#] in the startup information file `jpccomm.ini` from `2` to `1`.

  #
  x represents the product ID of PFM - RM. For details about the product ID, see *B. List of Identifiers*. When multiple PFM - RM products have been installed on the same host, set the value of the `NS Init Retry Count` label for each product ID.

  The following is the storage location of the startup information file `jpccomm.ini`:

  When the PFM - RM host is a physical host:
  installation-folder`\jpccomm.ini`

  When the PFM - RM host is a logical host:
  environment-directory[#]`\jp1pc\jpccomm.ini`

#
This is a directory on a shared disk specified when the logical host was created.

7.2.2 Problems relating to command execution

This subsection describes how to correct errors related to the execution of a command in Performance Management.

(1) The name of an inactive service is output when you execute the jpctool service list command

Potential causes and actions to take are as follows:

- *You uninstalled a Performance Management program without deleting its service information*
  When you uninstall a Performance Management program, the service information for the program remains in the database. Execute the `jpctool service delete` command to delete the service information for the program. For details about how to delete service information, see the chapter on installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.
- *A machine's host name was changed without deleting the Performance Management service information*
  If you change a machine's host name without deleting the Performance Management service information, service information that is linked to a service ID associated with the previous host name will remain in the database managed by the Master Manager service. You can use the `jpctool service delete` command to delete this service information. For details about how to delete service information and how to change host names, see the chapter on installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

(2) The data output by the jpctool db dump command is not the Store data you specified

If you execute the `jpctool db dump` command multiple times for the same Master Store or Remote Monitor Store service, and specify the same export file name each time, each subsequent execution of the command overwrites the results of the previous one. You should specify a different export file each time you execute the command for the same Master Store or Remote Monitor Store service. For details about how to export the Store database, see the chapter on management of operation monitoring data in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

7.2.3 Problems relating to report definitions

This subsection describes cause of errors related to report definitions.

(1) During a certain period, the collected performance data is not shown in the historical report

If you change the system clock of PFM - RM for Microsoft SQL Server host to the future time, the collected performance data between the time before you changed the system clock and the time after you changed the system clock is not shown in the historical report.

7.2.4 Problems relating to alarm definitions

This subsection describes how to correct errors related to alarm definitions in Performance Management.

(1) A program defined in an action does not operate correctly

Potential causes and actions to take are as follows:

- *PFM - Manager is not running, or the Action Handler service is not running on the host on which the action is executed*

  If PFM - Manager is not running, or the Action Handler service is not running on the host on which the action is executed, the action will not be executed. To allow the action to be executed, make sure that both are running.

(2) Alarm events are not displayed

Potential causes and actions to take are as follows:

- *PFM - Manager has not started*

  If PFM - Manager is not running, PFM - RM for Microsoft SQL Server will be unable to issue alarm events properly. If you are monitoring for alarm events, make sure that PFM - Manager is running.

(3) Although the alarm threshold has been exceeded, the color of the alarm icon displayed in the Alarm Status window of the Agents tree remains green

Potential causes and actions to take are as follows:

- An alarm table that uses Japanese is bound in an environment where the `LANG` environment variables of the PFM - Manager host and PFM - RM host are not both Japanese.

  As a result, an alarm using Japanese is not evaluated correctly. Make the `LANG` environment variables of both the PFM - Manager host and the PFM - RM host Japanese for operation of the system. To check the settings of the `LANG` environment variable, see the common message log and check whether the latest service startup message is output in Japanese or in English.

  Note that when the PFM - Manager host operates in an English environment, if you change the environment to a Japanese environment without changing the current settings, the existing alarm definition becomes garbled and cannot be deleted. Accordingly, take the following actions:

  1. When you need an alarm table that uses Japanese in the alarm definition, export all of the alarm tables from PFM - Web Console.

     The `jpctool alarm export` command cannot be used for export.

     For details about how to export an alarm table, see the chapter that describes the export of alarm tables in the *Job Management Partner 1/Performance Management User's Guide*.
  2. Delete all the alarm tables that use Japanese in the alarm definition.
  3. Stop PFM - Manager.
  4. Change the `LANG` environment variable of the PFM - Manager host to Japanese.
  5. Start PFM - Manager.
  6. When you have exported alarm tables in step 1, use PFM - Web Console or the `jpctool alarm import` command to import the alarm tables.

     For details about how to import an alarm table, see the chapter that describes the import of alarm tables in the *Job Management Partner 1/Performance Management User's Guide*.

For additional notes on an environment in which both Japanese and English are used, see the chapter that provides notes on such environments in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

7.2.5 Problems relating to the collection and management of performance data

This subsection describes how to correct errors related to the collection and management of performance data in Performance Management.

(1) The PFM - RM for Microsoft SQL Server Store database remains large despite setting a short retention period

If the Store database has already reached its maximum file capacity when you reduce the data retention period, file size will not decrease. In this case, back up and then restore the Store database after reducing the retention period.

For details about how to set the data retention period, see the chapter on management of operation monitoring data in the *Job Management Partner 1/Performance Management User's Guide*. For details about how to back up and restore the Store database, see the chapter on backup and restoration in the *Job Management Partner 1/Performance Management User's Guide*.

(2) The following message is output to the common message log: "Illegal data was detected in the Store database"

If a service terminates or the machine shuts down unexpectedly, inconsistencies may appear in the data in the Store database. In this case, take the following action:

- If you have a backup of the Store database, restore the database from the backup.
- If you do not have a backup, stop the Remote Monitor Store service, delete the corresponding database files (`*.DB` and `*.IDX` files), and then restart the service.

(3) Performance data is not collected after PFM - RM for Microsoft SQL Server startup

Take the following action:

- Check the startup status of the monitored host.
- If PFM - RM for Microsoft SQL Server and the monitoring target communicate across a firewall, check the port number to route traffic through the firewall.
- Check the startup status of the Microsoft SQL Server and start it if it is inactive.
- Check the monitoring target settings.
- Execute the `jpcconf target setup` command to specify the correct value for each item.
- Check the instance environment settings.

  Execute the `jpcconf inst setup` command to specify the correct value for each item.

For details about the `jpcconf agent setup` command, see the chapter on the commands in the manual *Job Management Partner 1/Performance Management Reference*.

7.2.6 Other problems

Check what events occur when the problem is encountered. If a message has been output, check the contents of the message. For details about the log information output by Performance Management, see *7.3 Log information*.

If the actions described in sections *7.2.1 Problems relating to the start and setup of services* through *7.2.5 Problems relating to the collection and management of performance data* do not resolve the problem, or the problem arises in a different scenario, collect information to determine the cause of the problem, and contact the system administrator.

For details about the data you need to collect and how to collect it, see *7.4 Required troubleshooting information* and *7.5 Collecting troubleshooting information*.

7.3 Log information

You can determine what action to take when a problem occurs in Performance Management by reviewing the log information. Five types of log information are output during Performance Management operation:

- System log
- Common message log
- Operation status log
- Trace log
- Agent log

This section explains each type of log information.

7.3.1 Types of log information

(1) System log

A system log contains log information that describes the system status and reports errors in the system. System logs are output to the following log files:

- In Windows
  Event log file

For details about the output format, see the chapter on log information in the manual *Job Management Partner 1/ Performance Management Reference*.

Cautionary note on logical host use

In addition to the system log for Performance Management, logs for the cluster software are required. Use these logs to check the instructions issued to Performance Management by the cluster software.

(2) Common message log

The common message log contains log information that describes the system status and reports errors in the system. The common message log contains information that is more detailed than that in the system log. For details about the output file name and file size of the common message log, see *7.3.2 List of log files and directories*. For details about the output format of the common message log, see the chapter on log information in the manual *Job Management Partner 1/Performance Management Reference*.

Cautionary note on logical host use

When Performance Management is set up for logical host use, the common message log is output to a shared disk and inherited at failover. This means that the messages are recorded in the same log file before and after failover.

(3) Operation status log

The operation status log contains log information output by PFM - Web Console. For details about the output file name and file size of the operation status log, see the chapter on troubleshooting in the *Job Management Partner 1/ Performance User's Guide*. For details about the output format of the operation status log, see the chapter on log information in the manual *Job Management Partner 1/Performance Management Reference*.

(4) Trace log

A trace log contains log information that helps you investigate the status of the system leading up to the problem, and measure the processing time for each process.

Trace logs are output to the log files belonging to each Performance Management service.

Cautionary note on logical host use:

When Performance Management is set up for logical host use, trace logs are output to the shared disk and inherited at failover. This means that the messages are recorded in the same log file before and after failover.

(5) Agent log

An agent log that is output by PFM - RM for Microsoft SQL Server contains log information about the processing executed to acquire records. If a problem occurs, collect agent logs to acquire detailed information about the processing.

Agent logs are output to separate files according to its type: normal log or error log. For details about output destinations, see *7.3.2(3) Agent log*.

Format:

The format of an output agent log is as follows:

```
yyyy/mm/dd hh:mm:ss.sss agt4 PID inf1 inf2 inf3 MessageID Message
```

The following explains the output items.

Table 7-2: Agent log items

Item	Description
yyyy/mm/dd	Date on which the log was output (*yyyy*: year, *mm*: month, and *dd*: day)
hh:mm:ss.sss	Local time at which the log was output (*hh*: hour, *mm*: minute, *ss*: second, and *sss*: millisecond)
agt4	Name of the process that output the log (*agt4* is the process name of PFM - RM for Microsoft SQL Server).
PID	Output process ID
inf1 to inf3	Maintenance information
MessageID	Message ID#
Message	Message#

#

For details about the message contents, see *6. Messages*.

Notes

- Do not change the time set on the RM host or the update time of an agent log file. Since information about the last update date and time is used to output agent logs, the agent logs may not be output correctly if these times are changed.
- When Performance Management is set up for logical host use, specify a path on the shared disk so that the agent log output destination is the same for both the executing node and the standby node.

7.3.2 List of log files and directories

This subsection describes the log information output by a Performance Management program. Performance Management outputs the following log information:

For details about the output file name and file size of the operation status log, see the chapter on troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

(1) Common message log

This subsection describes the common message log output by Performance Management. The following tables show the name of the service or command that outputs the log, the name of the log file, and the disk space used by each file, for each OS.

Table 7-3: Common message log file names

Type of log	Output source	File name	Disk usage#1 (KB)
Common message log	Performance Management	*installation-folder*\log\jpclog{01|02}#2	2,048 (x2)
		installation-folder\log\jpclogw{01|02}#2	2,048 (x2)
Common message log (logical host use)	Performance Management on logical host	*environment-directory*#3 \jp1pc\log\jpclog{01|02}#2	2,048 (x2)
		environment-directory#3 \jp1pc\log\jpclogw{01|02}#2	2,048 (x2)

#1

The number enclosed in brackets indicates the number of log files created for the service. For example, if the disk usage is 2,048 (x2), Performance Management creates one or two log files, each taking up a maximum of 2,048 kilobytes of disk space. In this case, the total disk usage will be 4,096 KB.

#2

Common message log files are suffixed with 01 or 02.

When using sequential files (jpclog)

Initially, log information is output to a log file with the suffix 01. When the log file reaches the maximum size, its suffix is changed from 01 to 02, and a new log file is created with the suffix 01. Subsequent log information is output to the new log file. If a log file with the suffix 02 already exists, it is overwritten. The latest log information is always output to the log file with the suffix 01.

When using wraparound files (jpclogw)

Initially, log information is output to a log file with the suffix 01. When the log file reaches the maximum size, a new log file is created with the suffix 02. Subsequent log information is output to the new log file. If a log file with the suffix 02 already exists, the entire contents of the file are deleted, and new log information is added from the top of the file. Performance Management then alternates between the two files as each fills with data.

For details about the output format of the log files, see the chapter on detecting errors in Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

#3

The environment directory is the directory you specified on the shared disk when creating the logical host.

(2) Trace log

This subsection describes the trace logs output by Performance Management. The following tables list the name of the service or command that outputs trace logs for PFM - RM for Microsoft SQL Server and the directory where the logs are stored, for each OS.

Table 7-4: Trace log storage folders

Type of log	Output source	Folder name
Trace log	Action Handler service	*installation-folder*\bin\action\log\
	Performance Management command	*installation-folder*\tools\log\
	Remote Monitor Collector service	*installation-folder*\agt4\agent*instance-name*\log\

Type of log	Output source	Folder name
Trace log	Remote Monitor Store service	*installation-folder*\agt4\store*instance-name*\log\
	Status Server service	*installation-folder*\bin\statsvr\log\
Trace log (logical host use)	Action Handler service	*environment-directory*#\jp1pc\bin\action\log\
	Performance Management command	*environment-directory*#\jp1pc\tools\log\
	Remote Monitor Collector service	*environment-directory*#\jp1pc\agt4\agent*instance-name*\log\
	Remote Monitor Store service	*environment-directory*#\jp1pc\agt4\store*instance-name*\log\

#

The environment directory is the directory you specified on the shared disk when creating the logical host.

(3) Agent log

This subsection describes the agent logs output by Performance Management. The following tables list the name of the service or command that outputs agent logs for PFM - RM for Microsoft SQL Server, the name of the log file, and the disk space used by each file.

Table 7-5: Agent log files

Type of log	Output source	Default output destination#1	File name	Default Disk usage#1 (MB)
Normal log	PFM - RM for Microsoft SQL Server	*installation-folder*\agt4\agent*instance-name*\log\	agt4inf{01|02}#2	16
Error log			agt4err{01|02}#2	
Normal log (logical host use)	PFM - RM for Microsoft SQL Server	*environment-directory*#3\jp1pc\agt4\agent*instance-name*\log\	agt4inf{01|02}#2	16
Error log (logical host use)			agt4err{01|02}#2	

#1

You can use the following methods to check and change the output destination of agent logs and the maximum file size:

- `jpcconf inst setup` command
- RM Configuration property in the PFM - Web Console window

For details about how to use the `jpcconf inst setup` command to change the settings, see *2.4.3 Updating an instance environment*.

#2

Agent logs are output using two sequential files. The file names are suffixed with `01` or `02`, which have the following meanings:

- `01`: Current file
- `02`: Backup file

For details about sequential files, see When using sequential files (jpclog) in *(1) Common message log*.

#3

The environment directory is on the shared disk specified when the logical host was created.

7.4 Required troubleshooting information

If the actions described in *7.2 Troubleshooting procedures* do not resolve the problem, collect information to determine the cause of the problem, and then contact the system administrator. This section describes the information you need to collect when an error occurs.

Performance Management provides the `jpcras` command to collect the required information in a batch. Use this command to collect information about PFM - RM for Microsoft SQL Server. In the following tables, the information that can be collected by the `jpcras` command is indicated as such.

Note:

The data collected by the `jpcras` command depends on the options specified when the command was executed. For details about the command options and the data that can be collected, see the chapter on commands in the manual *Job Management Partner 1/Performance Management Reference*.

Cautionary notes on logical host use:

- When running in a logical host environment, Performance Management outputs logs to a shared disk. If the shared disk is online when you execute the `jpcras` command, the logs on the shared disk are also collected.
- To investigate the cause of a problem that occurred during failover, you will need information from before and after the failover. For this reason, you must collect information from both the executing node and the standby node.
- When Performance Management is running in a logical host environment, you must also collect information for the cluster software. Because Performance Management is started and stopped by the cluster software in a logical host environment, collecting this information allows you to check the behavior of Performance Management against the behavior of the cluster software.

7.4.1 In Windows

(1) Log information about the OS

Collect the information about the OS. Table 7-6 lists the information about the OS.

Table 7-6: Information about the OS

Type of information	Details	Default file name	Collected by jpcras command
System log	Windows event log	--	Y
Process information	List of processes	--	Y
System file	`hosts` file	*system-folder*`\system32\drivers\etc\hosts`	Y
	`services` file	*system-folder*`\system32\drivers\etc\services`	Y
OS information	System information	--	Y
	Network status	--	Y
	Host name	--	Y
	Windows firewall information	--	Y
Dump information (in Windows Server 2003)	Dr. Watson log file	*system-drive*`\Documents and Settings\All Users\Application Data\Microsoft\Dr Watson\drwtsn32.log`[#] *system-drive*`\Documents and Settings\All Users\Application Data\Microsoft\Dr Watson\user.dump`[#]	Y

Type of information	Details	Default file name	Collected by jpcras command
Dump information (in Windows Server 2008)	Problem Reports and Solutions log file	*user-mode-process-dump-output-folder**program-name.process-ID.dmp* Example: jpcagt4.exe.2420.dmp	N

Legend:

Y: Can be collected

N: Cannot be collected

--: Not applicable

#

If you set up Dr. Watson to output log files to a different folder, collect the information from that folder.

(2) Performance Management information

Collect the log information about Performance Management. If the problem relates to a network connection, also collect information from the machine that is the connection target. Table 7-7 lists the log information about the Performance Management:

Table 7-7: Log information about Performance Management

Type of information	Details	Default file name	Collected by jpcras command
Common message log	Message log output by Performance Management (sequential files)	*installation-folder*\log\jpclog{01|02}[#1]	Y
	Message log output by Performance Management (wraparound files)	*installation-folder*\log\jpclogw{01|02}[#1]	Y
Configuration information	Configuration information files	--	Y
	Output of jpctool service list command	--	Y
Version information	Product versions	--	Y
	Log information	--	Y
Database information	Remote Monitor Store service	*installation-folder*\agt4\store*instance-name*\STPD The following files under the *installation-folder*\agt4\store*instance-name*\STPI folder: *.DB *.IDXq\store*instance-name* *.IDX	Y[#2]
Trace log	Trace information for Performance Management services	--[#3]	Y
Agent log	Normal log for processing related to	*installation-folder*\agt4\agent*instance-name*\log\agt4inf{01|02}[#4]	Y[#5]

Type of information	Details	Default file name	Collected by jpcras command
Agent log	acquisition of PFM - RM for Microsoft SQL Server records	*installation-folder*\agt4\agent*instance-name*\log\agt4inf{01|02}[#4]	Y[#5]
	Error log for processing related to acquisition of PFM - RM for Microsoft SQL Server records	*installation-folder*\agt4\agent*instance-name*\log\agt4err{01|02}[#4]	Y[#5]
Install log[#6]	Message logs from installation	The following files under the *system-folder*\TEMP\HCDINST folder: • HCDMAIN.LOG • HCDINST.LOG • *product-model-name*.LOG	N

Legend:

Y: Can be collected

N: Cannot be collected

--: Not applicable

#1

For details about the output format of the log files, see the chapter on detecting errors in Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

#2

If you change the default storage folder, you cannot collect database information by using the `jpcras` command. In this case, manually collect the information from the folder.

#3

For details about the trace log storage destination folder, see *7.3.2(2) Trace log*.

#4

For details about the output format of an agent log and how to change the storage folder, see *7.3.2(3) Agent log*.

#5

The `jpcras` command collects agent log information only from the currently specified output destination folder. If you change the output destination folder for agent logs, you need to manually collect data from the agent log files that were output before the change.

#6

Collect this information if installation failed.

(3) Operation information

Collect the following information about the operation that was being performed when the problem occurred:

- Details of the operation
- Time when the error occurred
- Machine configuration (version of each OS, host name, configuration of PFM - Manager and PFM - RM for Microsoft SQL Server)
- Whether the error is reproducible
- Name of any Performance Management user who logged in from PFM - Web Console
- The argument specified for the command if the error occurred during command execution

(4) Error information on the screen

Collect hard copies of the following:

- Windows on the screen when the application error occurred
- The error dialog boxes (Also copy the detailed information if a dialog box contains a **Details** button.)
- Information in the Command Prompt window or **Administrator Console** window when an error occurs during command execution

(5) User dump (in Windows Server 2008)

In Windows Server 2008, if a Performance Management process stops due to an application error, obtain a user dump.

(6) Collecting problem reports (in Windows Server 2008)

In Windows Server 2008, if a Performance Management process stops due to an application error, obtain a problem report.

(7) Other information

The following types of information are also necessary:

- Contents of **System** and **Application** in the Windows Event Viewer window (in Windows Server 2003 and Windows Server 2008)
- Content of **System Information** under **System Tools** under **Accessories** (in Windows Server 2003 and Windows Server 2008)
- Content of **System Information** under **Administrative** Tools (Windows Server 2012)

7.5 Collecting troubleshooting information

This section describes how to collect information when an error occurs.

7.5.1 In Windows

(1) Collecting dump information (in Windows Server 2008)

To collect dump information in a Windows Server 2008 environment:

1. Open Task Manager.
2. Select the process tab.
3. Right-click the process name for which you want to collect dump information, and then select **Create Dump File**.
   Dump files are stored in the following folder:
   system-drive\Users*user-name*\AppData\Local\Temp
4. Obtain the dump file from the folder created in step 3.
   If you have changed the environment variable settings so that dump files are output to a different folder, obtain the dump file from that folder.

(2) Execute the data collection command

To collect data for investigating the cause of the error, you use the `jpcras` command. The procedure for executing the data collection command is described below. Note that the operations explained here must be executed by a user who has the Administrators permission as an OS user.

To collect data:

1. Log onto the host on which the service whose data is to be collected is installed.
2. At the command prompt, execute the following command and enable the command extended function of the command interpreter.
   ```
   cmd /E:ON
   ```
3. Specify the data to be collected and the folder for storing it, and execute the `jpcras` command.
   In the example shown below, all information that can be collected using the `jpcras` command is stored in the folder `c:\tmp\jpc\agt`.
   ```
   jpcras c:\tmp\jpc\agt all all
   ```

When the `jpcras` command is executed, the `jpctool service list -id * -host *` command is executed internally to obtain a list of PFM services and to confirm whether the services are running. Execution of this internal command might take a long time if a firewall exists between the host that executes the command and a host in another Performance Management system or if the system configuration is large. In either case, you can set the `JPC_COLCTRLNOHOST` environment variable to `1` to suppress processing of the `jpctool service list -id * -host *` command to shorten the command execution time.

For details about the `jpcras` command, see the chapter on commands in the manual *Job Management Partner 1/ Performance Management Reference*.

Note on executing the command in a Windows Server 2008 environment

If the user account control functionality (UAC) is enabled in the OS, the User Account Control dialog box might be displayed during command execution. If it is displayed, click the **Continue** button to continue data collection, or click the **Cancel** button to cancel data collection.

(3) Execute the data collection command (for logical host use)

When you run Performance Management in a logical host environment, the data is stored on a shared disk. In this case, collect data from both the executing node and the standby node.

Use the jpcras command to collect the information needed to investigate an error. The following procedure shows how to execute the data collection command. Note that you must perform these operations as an OS user who belongs to the Administrators group.

To execute the data collection command in a logical host environment:

1. Bring the shared disk online.
   For logical hosts, data is stored on a shared disk. On the executing node, make sure that the shared disk is online before collecting data.
2. Execute the jpcras command on both the executing node and the standby node, specifying the data to collect and the folder in which to store it.
   For example, to have the jpcras command store all collectible data in the folder c:\tmp\jpc\agt, specify the command as follows:
   ```
   jpcras c:\tmp\jpc\agt all all
   ```
   If you execute the jpcras command without specifying the lhost argument, data relating to Performance Management is collected from all physical and logical hosts on that node. If any Performance Management programs are running in a logical host environment, the log files will be collected from the shared disk.
   If the shared disk is offline for the node on which you execute the jpcras command, you will be unable to acquire the files on the shared disk. However, the command will end normally without generating an error.
   Note
   You need to collect data from both the executing node and standby node by executing the data collection command on each node. Data from both nodes is required to investigate the status of the system leading up to and following failover.
   When the jpcras command is executed, the jpctool service list -id * -host * command is executed internally to obtain a list of PFM services and to confirm whether the services are running. Execution of this internal command might take a long time if a firewall exists between the host that executes the command and a host in another Performance Management system or if the system configuration is large. In either case, you can set the JPC_COLCTRLNOHOST environment variable to 1 to suppress processing of the jpctool service list -id * -host * command to shorten the command execution time.
   For details about the jpcras command, see the chapter on commands in the manual *Job Management Partner 1/ Performance Management Reference*.
3. Collect data about the cluster software.
   This data is required to determine whether a problem is caused by Performance Management or the cluster software. Collect data from which you can determine the results of any instructions, such as start and stop requests that the cluster software issued to Performance Management.

Note on executing the command in a Windows Server 2008 environment

If the user account control functionality (UAC) is enabled in the OS, the User Account Control dialog box might be displayed during command execution. If it is displayed, click the **Continue** button to continue data collection, or click the **Cancel** button to cancel data collection.

(4) Obtaining the Windows event log

Get the contents of **System** and **Application** in the Windows Event Viewer window.

(5) Check the operation information

If an error occurs while an operation is being performed, check and record information about the operation. Check the following information:

- Details of the operation
- The time when the error occurred
- Machine configuration (version of each OS, host name, configuration of PFM - Manager and PFM - RM for Microsoft SQL Server)
- Whether the error is reproducible
- Name of any Performance Management user who logged in from PFM - Web Console

- The argument specified for the command if the error occurred during command execution

(6) Collect error information displayed on the screen

Collect hard copies of the following:

- Windows on the screen when the application error occurred
- The error dialog boxes
  Also copy the detailed information if the dialog box contains a **Details** button.
- Hard copy of the **Command Prompt** window or **Administrator Console** window if a problem occurred during command execution
  To obtain a hard copy of the **Command Prompt** window specify the following in the **Command Prompt Properties** window:
  - **Edit Options** under the **Options** tab
    Select **Quick Edit Mode**.
  - **Layout** tab
    Set **Height** under **Screen Buffer Size** to `500`.

(7) Collecting other information

Information to be collected for all OSs

Contents of the dialog box displayed by choosing **Accessories**, **System Tools**, and then **System Information**

7.6 Detecting errors in Performance Management

Performance Management provides a status management facility that allows you to check the status of Performance Management itself when an error occurs. This facility monitors the operating status of PFM - RM for Microsoft SQL Server and PFM - RM host and reports these operating statuses on the PFM - Web Console.

By using PFM service automatic restart facility, you can automatically restart PFM services when PFM services abnormally end, or you can regularly restart PFM services.

When you monitor the operating status of PFM - RM for Microsoft SQL Server or automatically restart PFM services, use *the status management facility*, which checks the detailed status of Performance Management services. As a result, it is required that the version number of PFM - RM for Microsoft SQL Server you are using supports the status maintenance facility and that you enable it. Note that there are no prerequisites for monitoring the PFM - RM hosts.

Alternatively, you can use JP1/Base, an integrated system monitor, to monitor the log file of Performance Management so that you can detect errors in Performance Management. By using these facilities, the system administrator can detect errors when they occur, identify the cause of them, and then take the appropriate action to recover from them.

For details about detecting errors in Performance Management itself, see the chapter on error detection in Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

7.7 Recovering from errors in Performance Management system

When an error occurs on a Performance Management server, you must use backup files to restore the system to a normal state before the error occurred.

For details about how to do so, see the chapter on troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

Appendixes

A. Estimating System Requirements

Hitachi recommends that you estimate in advance whether the computer to be configured in your PFM - RM for Microsoft SQL Server system has sufficient processing capacity to run the program.

This appendix describes the system requirements you need to consider.

A.1 Memory requirements

Memory requirements depend on how PFM - RM for Microsoft SQL Server is set up and used.

For details about the formula for estimating memory requirements, see the *Release Notes*.

A.2 Disk space requirements

Disk space requirements depend on the number of records used to collect performance data.

To estimate the disk space requirements, you need to estimate the disk space requirements of the entire system and the Store database. For details about the formula for estimating these requirements, see the *Release Notes*.

A.3 Disk space requirements for operation in a cluster system

The disk space requirements for operation in a cluster system are estimated in the same way as for operation on a single node. For details about the disk space requirements, see the *Release Notes*.

A.4 Calculating the number of instances for records

The following table shows how to calculate the number of instances for each record collected by RM for Microsoft SQL server.

Note

The number of instances is used as dynamic information about the monitored Microsoft SQL Server. Since the number of instances dynamically changes due to factors such as the number of connections with the monitored Microsoft SQL Server, use the maximum of the obtained values for your estimate.

Use `sqlcmd` or a similar program to access the Microsoft SQL Server to be monitored, and execute an SQL statement to obtain the number of instances. If a calculation method for the target record is provided in the table, use that method.

To use osql to obtain the number of instances:

1. Start sqlcmd.
2. As a user who has the following privilege, connect to the Microsoft SQL Server to be monitored:
   `-sysadmin`
3. For the record for which you want to check the number of instances, execute the SQL statement shown in Table A-5.

Table A-1: Calculating the number of instances for records

Record	SQL statements that obtains the number of instances, and calculation method
PI	The number of instances is 1.
PI_PI2	The number of instances is 1.
PI_SERV	The number of instances is 1.
PI_SRV2	The number of instances is 1.
PI_SI	The number of instances is 1.

Record	SQL statements that obtains the number of instances, and calculation method
PD	The number of instances is 1.
PD_CD	Number of the environment setting options shown in the result set when you execute the sp_configure system stored procedure.
PD_DD	SELECT count(*) FROM master..sysdatabases
PD_DS	SELECT count(*) FROM master..sysdatabases
PD_IA	The number of instances is 1.
PD_LD	SELECT count(*) FROM master..syslockinfo
PD_LOCK	The number of instances is 1.
PD_PDET	SELECT count(*) FROM (master..sysprocesses a LEFT JOIN master..syslogins b ON a.sid = b.sid) LEFT JOIN master..sysusers c ON a.sid = c.sid
PD_SS	The number of instances is 1.

B. List of Identifiers

When you operate PFM - RM for Microsoft SQL Server or extract performance data from its Store database, you may require an identifier of PFM - RM for Microsoft SQL Server. The following table describes the PFM - RM for Microsoft SQL Server identifiers.

Table B-1: List of PFM - RM for Microsoft SQL Server identifiers

Use	Name	Identifier	Description
Command	Product ID	`4`	The product ID is part of the service ID required when using a command to check the Performance Management system configuration or to back up performance data. For details about service IDs, see the naming rules described in the appendix in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.
	Service key	`RMSQL`	A service key is required when using a command to start or stop PFM - RM for Microsoft SQL Server. For details about service keys, see the naming rules described in the appendix in the *Job Management Partner 1/ Performance Management Planning and Configuration Guide*.
ODBC	Product type identifier	`RMSQLSERVER`	A Product type identifier is required when using SQL statements to extract data. For details, see the chapter on linkage to an ODBC-compliant application program in the *Job Management Partner 1/Performance Management User's Guide*.
Help	Help ID	`pca4`	The help ID indicates that the help is for PFM - RM for Microsoft SQL Server.

C. List of Processes

This appendix describes the processes of PFM - RM for Microsoft SQL Server.

The following table lists the PFM - RM for Microsoft SQL Server process. The value following the process name is the number of processes that can be started concurrently.

Note:

The process and limit numbers are identical whether PFM - RM for Microsoft SQL Server on a physical host or logical host.

Table C-1: Processes of PFM - RM for Microsoft SQL Server

Process name (Process count)	Function
`jpcagt4.exe`(*n*)	The process of the Remote Monitor Collector service. One process is started for each instance of PFM - RM for Microsoft SQL Server.
`jpcsto.exe`(*n*)	The process of the Remote Monitor Store service. One process is started for each instance of PFM - RM for Microsoft SQL Server.
`stpqlpr.exe`(1)#	The process for backup or export of the Store database

#

This process is a child process of the `jpcsto` process.

D. List of Port Numbers

This appendix lists the port numbers used by PFM - RM for Microsoft SQL Server.

For details about the port numbers and firewall routing in PFM - Manager and PFM - Base, see the appendixes in the manual *Job Management Partner 1/Performance Management Reference*.

The port numbers can be changed to suit the user environment.

For details about changing a port number, see the chapter on installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*. The TCP/IP protocol is used.

Note:

Performance Management supports network address translation in static mode (Basic NAT), which provides one-to-one address mapping.

Performance Management does not support dynamic NAT or NAPT containing port translations (IP Masquerade and NAT+).

D.1 Port numbers for PFM - RM for Microsoft SQL Server

The following table shows the port numbers used by PFM - RM for Microsoft SQL Server.

Table D-1: Port numbers used by PFM - RM for Microsoft SQL Server

Port number	Service name	Parameter	Use
Automatic#1	Remote Monitor Store service	`jp1pcsto4`[*nnn*] #2	Used for recording performance data or acquiring a historical report
Automatic#1	Remote Monitor Collector service	`jp1pcagt4`[*nnn*]#2	Used for binding an alarm or acquiring a real-time report

#1

A port number not already being used by the system is assigned automatically every time the service is restarted.

#2

When multiple instances are created, a sequential number (*nnn*) is appended to the second and subsequent instances. The first instance does not have a sequential number.

D.2 Routing through a firewall

(1) Routing through a firewall

If PFM - Manager and PFM - RM for Microsoft SQL Server communicate across a firewall, set fixed port numbers for all PFM - Manager and PFM - RM for Microsoft SQL Server ports. Set the port numbers in the directions shown in the table below so that all the services can route through the firewall.

Table D-2: Routing through a firewall (between PFM - Manager and PFM - RM for Microsoft SQL Server)

Service name	Parameter	Direction
Remote Monitor Store service	`jp1pcsto4` [*nnn*]#	RM ← Manager
Remote Monitor Collector service	`jp1pcagt4` [*nnn*]#	RM ← Manager

Legend:

Manager: PFM - Manager host

RM: PFM - RM host

← : Direction to start communication (connection) from the right-hand side to the left-hand side

#

When multiple instances are created, a sequential number (*nnn*) is appended to the second and subsequent instances. The first instance does not have a sequential number.

When starting communication (connection), the left-hand-side host that is being connected uses the port numbers listed in the table D-1. The right-hand-side host that opens communication uses the available port numbers allocated automatically by the OS. The range of the allocated port numbers differs depending on the host's OS.

In the case shown in table D-2, set up the firewall so that the Manager's temporary used transmitting port can route through the RM's receiving port.

Note:

To execute the `jpctool db dump` or `jpcconf inst list` command on a PFM - RM host, use either of the following methods:

- Execute these commands with the `proxy` option to communicate through PFM - Manager. For details about the `proxy` option of the `jpctool db dump` or `jpcconf inst list` command, see the chapter on commands in the manual *Job Management Partner 1/Performance Management Reference*.
- On each PFM - RM host, set port numbers in the direction shown in the table below to route traffic through the firewall.

Table D-3: Routing through a firewall (between each PFM - RM hosts)

Service name	Parameter	Direction
Remote Monitor Store service	`jp1pcsto4` [*nnn*]#	RM ← → RM
Remote Monitor Collector service	`jp1pcagt4` [*nnn*]#	RM ← → RM

Legend:

RM: PFM - RM host

← → : Direction to start communication (connection) from the left-hand side to the right-hand side, and from the right-hand side to the left-hand side

#

When multiple instances are created, a sequential number (*nnn*) is appended to the second and subsequent instances. The first instance does not have a sequential number.

(2) Routing through a firewall (for logical host use)

If PFM - Manager and PFM - RM for Microsoft SQL Server communicate across a firewall, set fixed port numbers for all PFM - Manager and PFM - RM ports. Set the port numbers in the directions shown in the table below so that all the services can route through the firewall.

Table D-4: Routing through a firewall (between PFM - Manager and PFM - RM (for logical host use))

Service name	Parameter	Direction
Remote Monitor Store service(logical host)	`jp1pcsto4`[*nnn*] #	RM(logical host) ← Manager
Remote Monitor Collector service(logical host)	`jp1pcagt4`[*nnn*] #	RM(logical host) ← Manager

Legend:

Manager : PFM - Manager host

RM(logical host) : PFM - RM host

Direction to start communication (connection) from the right-hand side to the left-hand side

#

When multiple instances are created, a sequential number (*nnn*) is appended to the second and subsequent instances. The first instance does not have a sequential number.

When starting communication (connection), the left-hand-side host that is being connected uses the port numbers listed in the table D-1. The right-hand-side host that opens communication uses the available port numbers allocated automatically by the OS. The range of the allocated port numbers differs depending on the host's OS.

In the case shown in table D-4, set up the firewall so that the Manager's temporary used transmitting port can route through the RM (logical host)'s receiving port.

E. PFM - RM for Microsoft SQL Server Properties

This appendix lists the properties of the following PFM - RM for Microsoft SQL Server services that are displayed in PFM - Web Console:

- Remote Monitor Store service
- Remote Monitor Collector service
- Remote agent and group agent

E.1 List of Remote Monitor Store service properties

The following table lists the properties for the Remote Monitor Store service of PFM - RM for Microsoft SQL Server.

Table E-1: List of Remote Monitor Store service properties of PFM - RM for Microsoft SQL Server

Folder name	Property name	Description
--	First Registration Date	Displays the date and time on which the service was first recognized by PFM - Manager.
	Last Registration Date	Displays the date and time on which the service was last recognized by PFM - Manager.
General	--	Stores information such as the host name and directories. The properties in this folder cannot be changed.
	Directory	Displays the name of the current directory where the service runs.
	Host Name	Displays the name of the physical host on which the service runs.
	Process ID	Displays the process ID of the service.
	Physical Address	Displays the IP address and port number of the host on which the service runs when IPv6 communication is disabled.
	Physical Address(IPv4)	Displays the IP address (IPv4) of the host on which the service runs when IPv6 communication is enabled.
	Physical Address(IPv6)	Displays the IP address (IPv6) of the host on which the service runs when IPv6 communication is enabled.
	Port Number	Displays the port number on which the service runs when IPv6 communication is enabled.
	User Name	Displays the name of the user who executed the service process.
	Time Zone	Displays the time zone in which the service was used.
System	--	Stores information about the OS under which the service runs. The properties in this folder cannot be changed.
	CPU Type	Displays the CPU type.
	Hardware ID	Displays the hardware ID.
	OS Type	Displays the type of OS.
	OS Name	Displays the name of the OS.
	OS Version	Displays the version of the OS.
Network Services	--	Stores information about the common library for Performance Management communication. The properties in this folder cannot be changed.

Folder name		Property name	Description
Network Services		Build Date	Displays the date on which the Remote Monitor Store service was created.
		INI File	Displays the directory containing the jpcns.ini file.
Network Services	Service	--	Stores information about the service. The properties in this folder cannot be changed.
		Description	Displays the host name in the following format: *instance-name_host-name*
		Local Service Name	Displays the service ID.
		Remote Service Name	Displays the service ID of the Master Manager service on the connection-target PFM - Manager host.
		EP Service Name	Displays the service ID of the Correlator service on the connection-target PFM - Manager host.
Retention		--	Sets the data retention period when the Store version is 1.0. Because the Remote Monitor Store service does not support Store version 1.0, the properties stored in this directory cannot be changed.
		Product Interval - Minute Drawer	The retention period for records of the PI record type per minute is displayed. The specifiable value is fixed to Day.
		Product Interval - Hour Drawer	The retention period for records of the PI record type per hour is displayed. The specifiable value is fixed to Day.
		Product Interval - Day Drawer	The retention period for records of the PI record type per day is displayed. The specifiable value is fixed to 2Days.
		Product Interval - Week Drawer	The retention period for records of the PI record type per week is displayed. The specifiable value is fixed to Week.
		Product Interval - Month Drawer	The retention period for records of the PI record type per month is displayed. The specifiable value is fixed to Month.
		Product Interval - Year Drawer	The retention period for records of the PI record type per year is displayed. The specifiable value is fixed to Year.
Retention Ex		--	Sets the data retention period when the Store version is 2.0. For details, see the chapter that describes management of operation monitoring data in the *Job Management Partner 1/Performance Management User's Guide*.
Retention Ex	Product Interval - *record-ID-of-PI-record-type*	--	Sets the retention period for records of the PI record type.
		Period - Minute Drawer (Day)	Sets the retention period for records of the PI record type per minute. Values from 0 to 366 days can be specified, on a daily basis.
		Period - Hour Drawer (Day)	Sets the retention period for records of the PI record type per hour. Values from 0 to 366 days can be specified, on a daily basis.
		Period - Day Drawer (Week)	Sets the retention period for records of the PI record type per day. Values from 0 to 522 weeks can be specified, on a weekly basis.
		Period - Week Drawer (Week)	Sets the retention period for records of the PI record type per week. Values from 0 to 522 weeks can be specified, on a weekly basis.
		Period - Month Drawer (Month)	Sets the retention period for records of the PI record type per month. Values from 0 to 120 months can be specified, on a monthly basis.

Folder name		Property name	Description
Retention Ex	Product Interval - *record-ID-of-PI-record-type*	Period - Year Drawer (Year)	Sets the retention period for records of the PI record type per year. This is fixed at 10.
	Product Detail - *record-ID-of-PD-record-type*	Period (Day)	Sets the retention period for each ID for records of the PD record type. Retention periods can be set as an integer from 0 to 366, in days.
Disk Usage		--	This folder contains information for disk space used by each database. The values in this folder are those current at the time the properties are displayed. The properties in this folder cannot be changed.
		Product Interval	Displays the disk space used by the records of PI record type
		Product Detail	Displays the disk space used by the records of PD record type
		Product Alarm	Displays the disk space used by the records of PA record type. This property is not used in PFM - RM for Microsoft SQL Server.
		Product Log	Displays the disk space used by the records of PL record type. This property is not used in PFM - RM for Microsoft SQL Server.
		Total Disk Usage	Displays the total disk space used by the entire database.
Configuration		--	Displays the property of the Remote Monitor Store service.
		Store Version	Displays the version of the Store database.

Legend:
--: Not applicable

E.2 List of Remote Monitor Collector service properties

The following table lists the properties for the Remote Monitor Collector service of PFM - RM for Microsoft SQL Server.

Table E-2: List of Remote Monitor Collector service properties of PFM - RM for Microsoft SQL Server

Folder name	Property name	Description
--	First Registration Date	Displays the date and time on which the service was first recognized by PFM - Manager.
	Last Registration Date	Displays the date and time on which the service was last recognized by PFM - Manager.
	Data Model Version	Displays the version of the data model.
General	--	Stores information such as the host name and directories. The properties in this folder cannot be changed.
	Directory	Displays the name of the current directory where the service runs.
	Host Name	Displays the name of the physical host on which the service runs.
	Process ID	Displays the process ID of the service.

Folder name		Property name	Description
General		Physical Address	Displays the IP address and port number of the host on which the service runs when IPv6 communication is disabled.
		Physical Address(IPv4)	Displays the IP address (IPv4) of the host on which the service runs when IPv6 communication is enabled.
		Physical Address(IPv6)	Displays the IP address (IPv6) of the host on which the service runs when IPv6 communication is enabled.
		Port Number	Displays the port number on which the service runs when IPv6 communication is enabled.
		User Name	Displays the name of the user who executed the service process.
		Time Zone	Displays the time zone in which the service is used.
System		--	Stores information about the OS under which the service runs. The properties in this folder cannot be changed.
		CPU Type	Displays the CPU type.
		Hardware ID	Displays the hardware ID.
		OS Type	Displays the type of OS.
		OS Name	Displays the name of the OS.
		OS Version	Displays the version of the OS.
Network Services		--	Stores information about the common library for Performance Management communication. The properties in this folder cannot be changed.
		Build Date	Displays the date on which the Remote Monitor Collector service was created.
		INI File	Displays the name of the directory containing the jpcns.ini file.
Network Services	Service	--	Stores information about the service. The properties in this folder cannot be changed.
		Description	Displays the host name in the following format: *instance-name_host-name*
		Local Service Name	Displays the service ID.
		Remote Service Name	Displays the service ID of the Remote Monitor Store service to which the Remote Monitor Collector service connects.
		EP Service Name	Display the service ID of the connection target Correlator service.
		AH Service Name	Displays the service ID of the Action Handler service on the same host.
JP1 Event Configurations		--	Specify the condition under which JP1 event is issued.
		Each service	The user selects **Yes** or **No** from a list (Remote Monitor Collector service, Remote Monitor Store service, Action Handler service, and Status Server service) to specify whether each service issues JP1 system event.
		JP1 Event Send Host	Specify the connection target JP1/Base event server. Note that you can specify the event server on the same logical or physical host that the Action Handler service is running. The value you specify must consist of alphanumeric characters, ".", and "-", and must not exceed 255 bytes. If you exceed 255 bytes, the value you specify is discarded. If you exceed 255 bytes or do not specify this value, the

Folder name		Property name	Description
JP1 Event Configurations		JP1 Event Send Host	host on which Action Handler service is running is used as the event issuing host. If you specify **localhost**, the physical host is set to this property.
		Monitoring Console Host	Specify the PFM - Web Console host, if you open a PFM - Web Console login page by using JP1/IM - Manager monitor startup function. The value you specify must consist of alphanumeric characters, ".", and "-", and must not exceed 255 bytes. If you exceed 255 bytes, the value you specify is discarded. If you exceed 255 bytes or do not specify this value, the connection target PFM - Manager host is set to this value.
		Monitoring Console Port	Specify the port number (HTTP request port number). The range of the value is from 1 to 65535. If the value you specify is out of the range, the value is discarded. If the value is out of the range or you do not specify this value, 20358 is set to this value.
JP1 Event Configurations	Alarm	JP1 Event Mode	Specify which type of events to issue when the alarm status changes. • JP1 User Event: issuing JP1 user Event. • JP1 System Event: issuing JP1 system event.
Detail Records		--	Stores the properties of a record of PD record type. The record ID of the collected record is shown in bold type.
Detail Records	*record-ID*[#1]	--	Stores the properties of a record.
		Description	Displays a description of the record. This property cannot be changed.
		Log	The user selects **Yes** or **No** from a list to specify whether to save the record to the Store database. The record is saved when this value is **Yes** and the value of **Collection Interval** is greater than zero.
		Log(ITSLM)	Displays **Yes** or **No** to indicate whether to save the records to the Store database of PFM - RM for Microsoft SQL Server from JP1/ITSLM - Manager. For this property, **No** (fixed value) is displayed.
		Monitoring(ITSLM)	Displays **Yes** or **No** to indicate the JP1/ITSLM - Manager setting for whether to send records to JP1/ITSLM - Manager. For this property, **No** (fixed value) is displayed.
		Collection Interval[#2]	Specifies the data collection interval. The value is in seconds, and can be from 0 to 2,147,483,647. When zero is specified, no data is collected.
		Collection Offset[#2]	Specifies the offset value to apply before the first collection cycle. The value is in seconds, and can be from 0 to 32,767, but must be less than the value specified in **Collection Interval**. The time at which the collected data is recorded matches the collection interval time, regardless of the offset value.
		LOGIF	Specifies conditions for saving the record to the database. Only records that satisfy the conditions are saved. This property shows the conditional expression (character string) specified in the LOGIF Expression Editor window, which opens when the user clicks **LOGIF** in the bottom frame of the **Properties** pane in the PFM - Web Console's **Services** page.
Interval Records		--	Stores the properties of a record of PI record type. The record ID of the collected record is shown in bold type.
Interval Records	*record-ID*[#1]	--	Stores the properties of the record.
		Description	Displays a description of the record. This property cannot be changed.

Folder name		Property name	Description
Interval Records	*record-ID*[#1]	Log	The user selects **Yes** or **No** from a list to specify whether to save the record to the Store database. The record is saved when this value is **Yes** and the value of **Collection Interval** is greater than zero.
		Log(ITSLM)	Displays **Yes** or **No** to indicate whether to save the records to the Store database of PFM - RM for Microsoft SQL Server from JP1/ITSLM - Manager. For this property, **No** (fixed value) is displayed.
		Monitoring(ITSLM)	Displays **Yes** or **No** to indicate the JP1/ITSLM - Manager setting for whether to send records to JP1/ITSLM - Manager. For this property, **No** (fixed value) is displayed.
		Collection Interval	Specifies the data collection interval. The value is in seconds, and can be from 0 to 2,147,483,647. When zero is specified, no data is collected.
		Collection Offset	Specifies the offset value to apply before the first collection cycle. The value is in seconds, and can be from 0 to 32,767, but must be less than the value specified in **Collection Interval**. The time at which the collected data is recorded matches the collection interval time, regardless of the offset value.
		LOGIF	Specifies conditions for saving the record to the database. Only records that satisfy the conditions are saved. This property shows the conditional expression (character string) specified in the LOGIF Expression Editor window, which opens when the user clicks **LOGIF** in the bottom frame of the **Properties** pane in the PFM - Web Console's **Services** page.
Log Records		--	Stores the properties of a record of PL record type. This folder is not used because PFM - RM for Microsoft SQL Server does not use this record.
Monitoring Targets		--	Stores the properties of the monitored hosts.
Monitoring Targets	Monitoring target name	--	Displays the descriptions of each monitoring target.
		Target Name	Displays the monitoring target name. This property cannot be changed.
		Target Host	Displays the monitored host name. This property cannot be changed.
Health Check Configurations		Health Check for Target Hosts	Specifies whether to poll a monitored host. The setting is applied to all of the monitored hosts in an instance.
Restart Configurations		--	Specifies the conditions for automatically restarting the PFM services.
		Restart when Abnormal Status	Specifies whether to automatically restart a service when the Status Server service cannot obtain the status of the Action Handler service, Remote Monitor Collector service, and Remote Monitor Store service in a normal state.
		Restart when Single Service Running	Specifies whether to automatically restart a service when only either the Remote Monitor Collector service or the Remote Monitor Store service is running.
Restart Configurations	Action Handler	Auto Restart	Specifies whether to use automatic restart for the Action Handler service.
		Auto Restart - Interval (Minute)	Specifies the interval for checking the operating status of a service when automatic restart is used. You can specify a value from 1 through 1,440 (minutes).

Folder name		Property name	Description
Restart Configurations	Action Handler	Auto Restart - Repeat Limit	Specifies the number of consecutive times restart is attempted when automatic restart is used. You can specify an integer value from 1 through 10.
		Scheduled Restart	Selects **Yes** or **No** from the list items to specify whether to use the normal restart procedure for the Action Handler service.
		Scheduled Restart - Interval	Specifies the restart interval when the normal restart procedure is used. You can specify an integer value from 1 through 1,000.
		Scheduled Restart - Interval Unit	Selects **Hour**, **Day**, **Week**, or **Month** from the list items to specify the unit for the restart interval when the normal restart procedure is used.
		Scheduled Restart - Origin - Year	Specifies the year when restart is performed. You can specify an integer value from 1971 through 2035.
		Scheduled Restart - Origin - Month	Specifies the month when restart is performed. You can specify an integer value from 1 through 12.
		Scheduled Restart - Origin - Day	Specifies the day when restart is performed. You can specify an integer value from 1 through 31.
		Scheduled Restart - Origin - Hour	Specifies the time (hour) when restart is performed. You can specify an integer value from 0 through 23.
		Scheduled Restart - Origin - Minute	Specifies the time (minute) when restart is performed. You can specify an integer value from 0 through 59.
	Remote Monitor Collector	Auto Restart	Specifies whether to use automatic restart for the Remote Monitor Collector service.
		Auto Restart - Interval (Minute)	Specifies the interval for checking the operating status of a service when automatic restart is used. You can specify a value from 1 through 1,440 (minutes).
		Auto Restart - Repeat Limit	Specifies the number of consecutive times restart is attempted when automatic restart is used. You can specify an integer value from 1 through 10.
		Scheduled Restart	Select **Yes** or **No** from the list items to specify whether to use the normal restart procedure for the Remote Monitor Collector service.
		Scheduled Restart - Interval	Specifies the restart interval when the normal restart procedure is used. You can specify an integer value from 1 through 1,000.
		Scheduled Restart - Interval Unit	Selects **Hour**, **Day**, **Week**, or **Month** from the list items to specify the unit for the restart interval when the normal restart procedure is used.
		Scheduled Restart - Origin - Year	Specifies the year when restart is performed. You can specify an integer value from 1971 through 2035.
		Scheduled Restart - Origin - Month	Specifies the month when restart is performed. You can specify an integer value from 1 through 12.
		Scheduled Restart - Origin - Day	Specifies the day when restart is performed. You can specify an integer value from 1 through 31.

Folder name		Property name	Description
Restart Configurations	Remote Monitor Collector	Scheduled Restart - Origin - Hour	Specifies the time (hour) when restart is performed. You can specify an integer value from 0 through 23.
		Scheduled Restart - Origin - Minute	Specifies the time (minute) when restart is performed. You can specify an integer value from 0 through 59.
	Remote Monitor Store	Auto Restart	Specifies whether to use automatic restart for the Remote Monitor Store service.
		Auto Restart - Interval (Minute)	Specifies the interval for checking the operating status of a service when automatic restart is used. You can specify a value from 1 through 1,440 (minutes).
		Auto Restart - Repeat Limit	Specifies the number of consecutive times restart is attempted when automatic restart is used. You can specify a value from 1 through 10.
		Scheduled Restart	Select **Yes** or **No** from the list items to specify whether to use the normal restart procedure for the Remote Monitor Store service.
		Scheduled Restart - Interval	Specifies the restart interval when the normal restart procedure is used. You can specify an integer value from 1 through 1000.
		Scheduled Restart - Interval Unit	Selects **Hour**, **Day**, **Week**, or **Month** from the list items to specify the unit for the restart interval when the normal restart procedure is used.
		Scheduled Restart - Origin - Year	Specifies the year when restart is performed. You can specify an integer value from 1971 through 2035.
		Scheduled Restart - Origin - Month	Specifies the month when restart is performed. You can specify an integer value from 1 through 12.
		Scheduled Restart - Origin - Day	Specifies the day when restart is performed. You can specify an integer value from 1 through 31.
		Scheduled Restart - Origin - Hour	Specifies the time (hour) when restart is performed. You can specify an integer value from 0 through 23.
		Scheduled Restart - Origin - Minute	Specifies the time (minute) when restart is performed. You can specify an integer value from 0 through 59.
ITSLM Connection Configuration		--	Displays information about the linked JP1/ITSLM - Manager.
ITSLM Connection Configuration	ITSLM Connection	--	Displays information about the connection-target JP1/ITSLM - Manager.
		ITSLM Host	Displays the host name of the connected JP1/ITSLM - Manager. If a connection with JP1/ITSLM - Manager has not been established, this property is not displayed.
		ITSLM Port	Displays the port number of the connected JP1/ITSLM - Manager. If a connection with JP1/ITSLM - Manager has not been established, this property is not displayed.
	MANAGE ITSLM CONNECTION	--	Specifies whether to end the connection with JP1/ITSLM - Manager.

Folder name		Property name	Description
ITSLM Connection Configuration	MANAGE ITSLM CONNECTION	DISCONNECT ITSLM CONNECTION	Selects from the list items the JP1/ITSLM - Manager host name that is to be disconnected. If **(empty string)** is selected from the list items, nothing is done. If a connection with JP1/ITSLM - Manager has not been established, only **(empty string)** is displayed in the list items.
Remote Monitor Configuration		--	Stores the properties for settings specific to PFM - RM for Microsoft SQL Server.
		LOG_PATH	Displays the output folder for agent log files, which was specified by using the `jpcconf inst setup` command. This property can be changed.#2
		LOG_SIZE	Displays the maximum size (in MB) of an agent log file, which was specified by using the `jpcconf inst setup` command. The default value is 16. To change this property, specify from 1 to 32. This property can be changed. #2

Legend:

--: Not applicable.

#1

The folder name is shown as the record ID excluding the database ID. For details about the record ID of each type of record, see *5. Records*.

#2

To reflect updated values, restart the Remote Monitor Collector service.

E.3 List of remote agent and group agent properties

The following table lists the properties for remote agent and group agent of PFM - RM for Microsoft SQL Server.

Table E-3: List of remote agent and group agent properties

Folder name	Property name	Description	Remote agent	Group agent
--	Data Model Version	Displays the version of the data model.	N	N
Remote Monitoring	--	Stores the properties of remote agent and group agent.	N	N
	Agent Type	Displays the agent type. • Remote agent: Remote Agent • Group agent: Group Agent	N	N
	RMName	Displays the service ID of PFM - RM for Microsoft SQL Server.	N	N
	Target Name	Displays the monitoring target name.	N	--
	Target Host	Displays the monitoring target host name.	N	--
	Group Name	Displays the group name.	--	N
	Primary Host	Displays the primary host name.	--	N

Folder name		Property name	Description	Remote agent	Group agent
Remote Monitoring		Grouping Targets	Displays the list of monitoring target name for a grouping target (in the listbox).	--	Y
Detail Records		--	Stores the properties of a record of PD record type. The record ID of the collected record is shown in bold type.	N	N
Detail Records	*record-ID*[#1]	--	Stores the properties of a record.	N	N
		Description	Displays a description of the record.	N	N
		Log[#2]	Display whether the record is saved or not. The record is saved when this value is **Yes**. Not saved when **No**. The record is saved to the database when this value is **Yes** and the value of Collection Interval is more than 0.	Y	Y[#3]
		Monitoring(ITSLM)	Displays **Yes** or **No** to indicate the JP1/ITSLM - Manager setting for specifying whether to send records to JP1/ITSLM - Manager. This property cannot be changed.	N	N
		Log(ITSLM)[#2]	Displays **Yes** or **No** to indicate whether to save the records to the Store database of PFM - RM for Microsoft SQL Server from JP1/ITSLM - Manager. Records are saved to the database when this value is **Yes** and the value of Collection Interval is more than 0. This property cannot be changed.	N	N
		Collection Interval	Specifies the data collection interval. The value is in seconds, and can be from 0 to 2,147,483,647. When zero is specified, no data is collected.	N[#4]	N[#4]
		Collection Offset	Specifies the offset value to apply before the first collection cycle. The value is in seconds, and can be from 0 to 32,767, but must be less than the value specified in **Collection Interval**. The time at which the collected data is recorded matches the collection interval time, regardless of the offset value.	N[#4]	N[#4]
		LOGIF	Specifies conditions for saving the record to the database. Only records that satisfy the conditions are saved. This property shows the conditional expression (character string) specified in the LOGIF Expression Editor window, which opens when the user clicks **LOGIF** in the bottom frame of the **Properties** pane in the PFM - Web Console's **Services** page.	N[#4]	N[#4]

Folder name		Property name	Description	Remote agent	Group agent
Interval Records		--	Stores the properties of a record of PI record type. The record ID of the collected record is shown in bold type.	N	N
Interval Records	*record-ID*[#1]	--	Stores the properties of a record.	N	N
		Description	Displays a description of the record.	N	N
		Log[#2]	Display whether the record is saved or not. The record is saved when this value is **Yes**. Not saved when **No**. The record is saved to the database when this value is **Yes** and the value of Collection Interval is more than 0.	Y	Y[#3]
		Log(ITSLM)[#2]	Displays **Yes** or **No** to indicate whether to save the records to the Store database of PFM - RM for Microsoft SQL Server from JP1/ITSLM - Manager. Records are saved to the database when this value is **Yes** and the value of Collection Interval is more than 0. This property cannot be changed.	N	N
		Collection Interval	Specifies the data collection interval. The value is in seconds, and can be from 0 to 2,147,483,647. When zero is specified, no data is collected.	N[#4]	N[#4]
		Collection Offset	Specifies the offset value to apply before the first collection cycle. The value is in seconds, and can be from 0 to 32,767, but must be less than the value specified in **Collection Interval**. The time at which the collected data is recorded matches the collection interval time, regardless of the offset value.	N[#4]	N[#4]
		LOGIF	Specifies conditions for saving the record to the database. Only records that satisfy the conditions are saved. This property shows the conditional expression (character string) specified in the LOGIF Expression Editor window	N[#4]	N[#4]
Log Records		--	Contains the properties for records of the PL record type. PFM - RM for Microsoft SQL Server does not use this property.	N	N
Remote Monitor Configuration		--	Stores the configuration properties unique to the monitoring target.	N	--
Remote Monitor Configuration	Target	--	Displays the overview of the remote agent service.	N	--
		SQL_INSTANCE	Displays the instance name of the monitored Microsoft SQL Server.	Y	--

Folder name		Property name	Description	Remote agent	Group agent
Remote Monitor Configuration	Target	SQL_USER	User name for the SQL Server authentication.	Y	--
		TIMEOUT	Displays the timeout value (in seconds) for queries to the database, which was specified by using the jpcconf target setup command. The default value is 60. To change this property, specify from 1 to 3600. This property can be changed.	Y	--
		LOGIN_TIMEOUT	Displays the timeout value (in seconds) for connecting to the database, which was specified by using the jpcconf target setup command. The default value is 20. To change this property, specify from 1 to 3600.This property can be changed.	Y	--
		DB_FREE_PERC_OPTION	Specifies the operation to be performed if the value of the Free % field of the Database Space Detail (PD_DS) record is negative. This property can be changed.	Y	--
		DB_FREE_PERC_NUMBER	Specifies a value to replace with the value of the Free % field of the Database Space Detail (PD_DS) record if the value is negative. This property is valid if Y is specified for the DB_FREE_PERC_OPTION property. This property can be changed.	Y	--
		LIMIT_PD_LD_NUMBER	The maximum number of collection records for the PD_LD records. This property can be changed.#4	Y	--

Legend:

Y: Displayed and updatable

N: Displayed but not updatable

--: Not displayed

#1

Displays the record ID excluding the database ID as the folder name. For details about the record ID for each record, see *5. Records*

#2

If the value of either property is **Yes**, the record is saved in the Store database.

#3

PFM - RM for Microsoft SQL Server associates only one monitoring target with one instance environment. As a result, the use of group agent is disabled. When you change the value of this property, do not change it from the group agent property. Change the value from the remote agent property.

#4

Displays the value you set up PFM - RM for Microsoft SQL Server.

F. List of Files and Folders

This appendix lists the files and folders of PFM - RM for Microsoft SQL Server for each OS.

The Performance Management installation folder for each OS is as follows.

In Windows:

Performance Management can be installed in any folder. The default installation folder is:

- For Windows Server 2003 (x64) and the 64-bit version of Windows Server 2008
  system-drive\Program Files(x86)\Hitachi\jp1pc\
- For other OSs:
  system-drive\Program Files\Hitachi\jp1pc\

F.1 PFM - RM for Microsoft SQL Server files and directories

The following table lists the files and folders of PFM - RM for Microsoft SQL Server.

Table F-1: List of files and folders for PFM - RM for Microsoft SQL Server

Folder name	File name	Description
installation-folder\agt4\	--	Base folder of PFM - RM for Microsoft SQL Server
	jpcagtras.bat	Maintenance information collection program
	jpcagtras.exe	
	readme.txt	README.TXT
	VERSION.TXT	VERSION.TXT
	insrules.dat	Instance startup environment rule definition file
installation-folder\agt4\agent\	--	Base folder of the Remote Monitor Collector service
	agtlist.ini	List of instances
	jpcagt.ini.instmpl	Remote Monitor Collector service startup initialization template file
	jpcagt4.exe	Service executing program of Remote Monitor Collector
	target.ini.tmpl	Configuration template file for monitoring targets
	group.ini.tmpl	Configuration template file for group agents
	targetrules.dat	Rule file for making monitoring targets
	GARULES.DAT	Rule file for making group agents
installation-folder\agt4\agent\ *instance-name*\	--	Base folder of Remote Monitor Collector service (for each instance)[#1]
	jpcagt.ini	Service startup initialization file of Remote Monitor Collector (for each instance)[#1]
	jpcagt.ini.model	Model file for the service startup initialization file of Remote Monitor Collector service (for each instance) [#1]
	status.dat	Relay file for internal processing[#2]
	targetlist.ini	List of monitoring targets

Folder name	File name	Description
installation-folder\agt4\agent\ *instance-name*\	GARULES.DAT	Rule file for making group agents
	grouplist.ini	List of group agents
	ADOlog.txt	Maintenance information file[#2]
installation-folder\agt4\agent\ *instance-name* \groups\	--	Folder for group agent
	groupname.ini	Configuration file for group agent
installation-folder\agt4\agent\ *instance-name* \log\	--	Storage folder for internal log file of the Remote Monitor Collector service (for each instance)[#1]
	agt4inf01.log agt4inf02.log	PFM - RM for Microsoft SQL Server agent log file
	agt4err01.log agt4err02.log	PFM - RM for Microsoft SQL Server agent log error file
	agt4inf.lck	Relay file for internal processing[#3]
	agt4err.lck	Relay file for internal processing[#3]
	msglog01 msglog02	Internal log file[#2]
	nslog01 nslog02	Internal log file[#2]
installation-folder\agt4\agent\ *instance-name* \targets\	--	Folder for remote agent
	Monitoring-target-name.ini	Configuration file for monitoring target
	Monitoring-target-name.ini.model	Model configuration file for monitoring target
installation-folder\agt4\lib\	--	Message catalog installation folder
	jpcagt4msg.dll	Message file
installation-folder\agt4\sql	--	SQL script storage folder
	sp_rdrp.sql	SQL script file for deleting an Microsoft SQL Server Database object
	sp_rist.sql	SQL script file for registering an Microsoft SQL Server Database object
	mk_rmus.sql	Script file for creating an Microsoft SQL Server account used by PFM - RM for Microsoft SQL Server
installation-folder\agt4\store\	*.DAT	Data model definition file
	--	Base folder of Remote Monitor Store service
	jpcsto.ini.instmpl	Remote Monitor Store service startup initialization template file
	stolist.ini	List of stores
installation-folder\agt4\store\ *instance-name*\	--	Base folder of Remote Monitor Store service (for each instance)[#1]
	*.DB	Performance data file (for each instance)[#2]
	*.IDX	Performance data index file (for each instance)[#2]

Folder name	File name	Description
installation-folder\agt4\store\ *instance-name*\	*.LCK	Performance data lock file (for each instance)#2
	jpcsto.ini	Remote Monitor Store (for each instance)#1
	jpcsto.ini.model	Model file for the service startup initialization file of Remote Monitor Store (for each instance)#1
	*.DAT	Data model definition file (for each instance)#1
installation-folder\agt4\store\ *instance-name*\backup\	--	Default database backup destination folder (for each instance)#1
installation-folder\agt4\store*instance-name*\partial\	--	Partial backup destination folder for standard databases (per instance)#1
installation-folder\agt4\store\ *instance-name*\dump\	--	Default database export destination folder (for each instance)#1
installation-folder\agt4\store*instance-name*\import\	--	Database import destination folder for standard databases (per instance)#1
installation-folder\agt4\store\ *instance-name*\log\	--	Storage folder for internal log file of Remote Monitor Store service (for each instance)#1
	msglog01 msglog02	Internal log file#2
	nslog01 nslog02	Internal log file#2
installation-folder\agt4\store*instance-name*\STPD\	--	PD database-specific folder
installation-folder\agt4\store*instance-name*\STPI\	--	PI database-specific folder
installation-folder\auditlog\	--	Action log file output folder
	jpcaudit*n*.log#4	Action log file
installation-folder\setup\	--	Setup file storage folder
	jpcagt4w.EXE	Archive file for PFM - RM for Microsoft SQL Server setup (Windows)

Legend:

--: Not applicable

#1

Created by execution of the `jpcconf inst setup` command.

#2

Created when the Remote Monitor Store service is started.

#3

This may be temporarily created.

#4

n is numeric value. The number of log files can be changed in the `jpccomm.ini` file.

In addition, install the runtime components of the Visual C++ 2010 library. The following table lists the files in the Visual C++ 2010 library that need to be installed.

Table F-2: List of files in the Visual C++ 2010 library that need to be installed

Folder name	File name	Description
system-folder\system32 (for x86) *system-folder*\SysWOW64 (for x64)	--	System folder
	mfc100.dll	Microsoft Visual C++ MFC runtime file
	mfc100u.dll	Microsoft Visual C++ MFC runtime file
	mfcm100.dll	Microsoft Visual C++ MFC runtime file
	mfcm100u.dll	Microsoft Visual C++ MFC runtime file
	mfc100chs.dll	Microsoft Visual C++ MFCLOC resource file
	mfc100cht.dll	Microsoft Visual C++ MFCLOC resource file
	mfc100deu.dll	Microsoft Visual C++ MFCLOC resource file
	mfc100enu.dll	Microsoft Visual C++ MFCLOC resource file
	mfc100esn.dll	Microsoft Visual C++ MFCLOC resource file
	mfc100fra.dll	Microsoft Visual C++ MFCLOC resource file
	mfc100ita.dll	Microsoft Visual C++ MFCLOC resource file
	mfc100jpn.dll	Microsoft Visual C++ MFCLOC resource file
	mfc100kor.dll	Microsoft Visual C++ MFCLOC resource file
	mfc100rus.dll	Microsoft Visual C++ MFCLOC resource file

G. Migration Procedure and Notes on Migration

To upgrade PFM - RM for Microsoft SQL Server, you need to perform overwrite installation on PFM - RM for Microsoft SQL Server. For details about the installation procedure, see the following chapters.

See *2. Installation and Setup*.

Notes

- Do not uninstall the old version of PFM - RM for Microsoft SQL Server during upgrading. If you uninstall it, performance data created in the old version is deleted and will no longer be available in the new version.
- When you perform overwrite installation on a PFM - RM for Microsoft SQL Server program, the following information is updated automatically:

  - Store database files of Remote Monitor Store service

  - `ini` file

  - Instance environment of PFM - RM for Microsoft SQL Server

H. Version Compatibility

For PFM - RM for Microsoft SQL Server, there are different data model versions as well as products.

The data model version remains unchanged. Because data models are upward-compatible, the report and alarm definitions created by an older version are available in a newer data model version.

The table below shows the correspondence between the versions of PFM - RM for Microsoft SQL Server.

Table H-1: Correspondence between PFM - RM for Microsoft SQL Server versions

PFM - RM for Microsoft SQL Server version	Data model version	Version of the monitoring template alarm table
09-00	4.0	09.00
10-00	4.0	09.00

For details about version compatibility, see the information in the appendixes of the manual *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

I. Deleting the R4QHITACHIPROCSPDATABASES Stored Procedure

This appendix describes how to delete the R4QHITACHIPROCSPDATABASES stored procedure.

The R4QHITACHIPROCSPDATABASES stored procedure is required to acquire a list of database names and sizes from Microsoft SQL Server when the monitored Microsoft SQL Server instance includes a database that is 2 TB or larger.

For details about how to register the R4QHITACHIPROCSPDATABASES stored procedure, see *2.1.4(3) Registering the R4QHITACHIPROCSPDATABASES Stored Procedure*.

I.1 Procedure for deleting R4QHITACHIPROCSPDATABASES

You can delete the R4QHITACHIPROCSPDATABASES stored procedure by using the sp_rdrp.sql script provided by PFM - RM for Microsoft SQL Server.

To delete R4QHITACHIPROCSPDATABASES:

1. Set up an environment in which the sqlcmd utility of Microsoft SQL Server can be executed.

   The sqlcmd utility is provided by Microsoft. For details about the environment settings for Microsoft SQL Server, see your Microsoft SQL Server documentation.
2. Move to the folder in which the sp_rdrp.sql script is located.

   The script is located in the following folder:

   installation-folder\agt4\agent\sql
3. Execute the script with the monitored Microsoft SQL Server instance specified.

   The command line for executing the sp_rdrp.sql script depends on the type of the monitored Microsoft SQL Server instance and the method of authentication used for connecting to Microsoft SQL Server. The following shows the command line for each condition.

   - When the default instance of Microsoft SQL Server is being monitored

Authentication	Command line for executing the sp_drop.sql script
SQL Server	sqlcmd -S *host-name* -U *user-name* -P *password* -d master -i sp_rdrp.sql [#]
Windows	sqlcmd -S *host-name* -E -d master -i sp_rdrp.sql [#]

   - When a named instance of Microsoft SQL Server is being monitored

Authentication	Command line for executing the sp_drop.sql script
SQL Server	sqlcmd -S *host-name**instance-name* -U *user-name* -P *password* -d master -i sp_rdrp.sql [#]
Windows	sqlcmd -S *host-name**instance-name* -E -d master -i sp_rdrp.sql [#]

   #

   The following describes the items that the user specifies:

   host-name: Name of the host on which the monitored Microsoft SQL Server instance operates

   instance-name: Name of the monitored Microsoft SQL Server instance

   user-name: sa or a user account having the permissions equivalent to sa (account of a member of the sysadmin fixed server role)

   password: Password for the specified user name

J. Outputting Action Log Information

Action log information of Performance Management is output in conjunction with the alarm function related to an exceeded threshold for information, such as system load.

For example, when PFM services start or stops or when the connection status with PFM - Manager changes, action logs are output.

Action logs are ouput if the version of PFM - Manager or PFM - Base is 08-10 or later.

An action log is a CSV text file. By saving action logs periodically and converting them with spreadsheet software, you can use the action logs as analysis data.

Output of action logs is specified in the `jpccomm.ini` file. This appendix describes the contents of the action log output by PFM - RM and PFM - Base, and how to specify the setting for outputting the action log.

J.1 Event types output to the action log

The following table shows the event types output to the action log and the times at which PFM - RM for Microsoft SQL Server and PFM - Base output information to the action log. The event types are the identifiers used within the action log to classify the events output to the action log.

Table J－1: Event types output to the action log

Event type	Explanation	PFM - RM for Microsoft SQL Server and PFM - Base output the action log when:
`ExternalService`	Events indicating the result of communication between a JP1 product and an external service. This event type also indicates that an abnormal communication has occurred.	The status of a connection with PFM - Manager has changed.
`ManagementAction`	Events indicating that an important program action has been executed. This event type also indicates that the action was executed in response to another audit category.	An automated action is executed.

J.2 Format for saving the action log files

This section explains the format for saving the action log files.

Action log information is output to a specified file (current output file). When the current output file becomes full, the action log information in that file is saved to another file (shift file). The procedure for switching the file for storing action log information is as follows:

1. Action log information is output sequentially to the current output file `jpcaudit.log`.
2. When the current output file becomes full, the action log information is saved in a shift file. The name of a shift file is the current output file name suffixed with a number. Each time the current output file becomes full, each shift file is renamed by incrementing the suffix by 1. Therefore, the file whose name has the largest number is the oldest log file.

   Example:

   When the current output file `jpcaudit.log` becomes full, the contents of the file are saved to the shift file `jpcaudit1.log`.

   When the current output file becomes full again, the information is moved to `jpcaudit1.log`, and the existing shift file `jpcaudit1.log` is renamed to `jpcaudit2.log`.

   Note that when the number of log files exceeds the number of saved log files (specified in the `jpccomm.ini` file), the oldest log file is deleted.
3. The current output file is initialized, and new action log information is written.

Whether action log information is to be output, the output destination, and the number of output files are specified in the `jpccomm.ini` file. For details about how to specify the `jpccomm.ini` file, see *J.4 Settings for outputting action logs*.

J.3 Action log output format

Information related to audit events is output to the Performance Management action log. One action log information file is output for one host (physical host and logical host). The action log file is output to either of the following hosts:

- When a service is executed: The file is output to the host on which the service runs.
- When a command is executed: The file is output to the host on which the command was executed.

The following describes the format of the action log, the output destination, and the items that are output.

(1) Output format

`CALFHM` *`x.x,output-item-1=value-1,output-item-2=value-2,...,output-item-n=value-n`*

(2) Output destination

On physical hosts

installation-folder`\auditlog\`

On logical hosts

environment-folder`\jp1pc\auditlog\`

The action log output destination can be changed in the `jpccomm.ini` file. For details about how to specify the `jpccomm.ini` file, see *J.4 Settings for outputting action logs*.

(3) Output items

There are two types of output items:

- Common output item
  An item that is always output by all JP1 products that output action logs
- Fixed output item
  An item that is optionally output by a JP1 product that outputs action logs

(a) Common output items

The following table lists and describes the common output items and their values. This table also includes the items and information output by PFM - Manager.

Table J-2: Common output items in action logs

No.	Output item		Value	Explanation
	Item name	Output attribute name		
1	Common specification identifier	--	`CALFHM`	Indicates the action log format.
2	Common specification revision number	--	*`x.x`*	Revision number for managing action logs
3	Serial number	`seqnum`	*serial-number*	Serial number of the action log record

No.	Output item		Value	Explanation
	Item name	Output attribute name		
4	Message ID	msgid	KAVE*xxxxx-x*	Message ID of the product
5	Date and time	date	*YYYY*-*MM*-*DD*T*hh*:*mm*:*ss*.*sss**TZD*#	Date, time, and time zone indication identifying when the action log was output
6	Program name	progid	JP1PFM	Name of the program for which the event occurred
7	Component name	compid	*service-ID*	Name of the component for which the event occurred
8	Process ID	pid	*process-ID*	Process ID of the process for which the event occurred
9	Location	ocp:host	• *host-name* • *IP-address*	Location where the event occurred
10	Event type	ctgry	• StartStop • Authentication • ConfigurationAccess • ExternalService • AnomalyEvent • ManagementAction	Category name used to classify the event output to the action log
11	Event result	result	• Success • Failure • Occurrence	Result of the event
12	Subject identification information	subj:pid	*process-ID*	One of the following: • Process ID of a process running as a user operation • Process ID of the process that caused the event
		subj:uid	*account-identifier* (PFM user/JP1 user)	• Name of the user who caused the event
		subj:euid	*effective-user-ID* (OS user)	• Identification information in a one-to-one correspondence with the user

Legend:

--: None

#

T is a separator between the date and the time.

TZD is the time zone specifier. One of the following values is output.

+*hh*:*mm*: The time zone is *hh*:*mm* ahead of UTC.

−*hh*:*mm*: The time zone is *hh*:*mm* behind UTC.

z: The time zone is same as UTC.

(b) Fixed output items

The following table lists and describes the fixed output items and their values. This table also includes the items and information output by PFM - Manager.

Table J-3: Fixed output items in action logs

No.	Output item		Value	Explanation
	Item name	Output attribute name		
1	Object information	obj	• *PFM - RM-service-ID* • *added-deleted-or-updated-user-name* (PFM user)	Intended object for the operation
		obj:table	*alarm-table-name*	
		obj:alarm	*alarm-name*	
2	Action information	op	• Start • Stop • Add • Update • Delete • Change Password • Activate • Inactivate • Bind • Unbind	Information about the action that caused the event
3	Permissions information	auth	• Administrator Management • General user Ordinary • Windows Administrator • UNIX SuperUser	Permissions information of the user who executed the command or service
		auth:mode	• PFM authentication mode pfm • JP1 authentication mode jp1 • OS user os	Authentication mode of the user who executed the command or service
4	Output source	outp:host	*PFM - Manager-host-name*	Host that output the action log
5	Instruction source	subjp:host	• *login-host-name* • *execution-host-name* (only when the jpctool alarm command is executed)	Host that issued the instruction for the operation
6	Free description	msg	*message*	Message that is output when an alarm occurs or when an automated action is executed

Whether the fixed output items are output and what they contain differ depending on when the action log is output. The following describes the message ID and output information for each case.

■ A PFM service is started or stopped (StartStop)

- Output host: The host on which the service is running

- Output component: The service that was started or stopped

Item name	Attribute name	Value
Message ID	msgid	Started: KAVE03000-I Stopped: KAVE03001-I
Action information	op	Started: Start Stopped: Stop

■ Stand-alone mode is started or terminated (StartStop)

- Output host: PFM - RM host
- Output component: Remote Monitor Collector service and Remote Monitor Store service

Item name	Attribute name	Value
Message ID	msgid	Stand-alone mode has started: KAVE03002-I Stand-alone mode has terminated: KAVE03003-I

#1

No fixed output items are output.

#2

When PFM - RM for Microsoft SQL Server is started, PFM - RM for Microsoft SQL Server services connect to the PFM - Manager host, register node information, and obtain the latest alarm definition information. If a connection with the PFM - Manager host cannot be established, PFM - RM for Microsoft SQL Server starts in stand-alone mode, in which only part of its functionality, such as collection of operating information, is enabled. In addition, KAVE03002-I is output to indicate that PFM - RM for Microsoft SQL Server has started in stand-alone mode. From this point, the PFM - RM for Microsoft SQL Server services periodically attempt to connect to PFM - Manager. When the services are able to successfully register node information or obtain definition information, PFM - RM for Microsoft SQL Server leaves stand-alone mode and KAVE03003-I is output. In this way, the action log enables you to understand that PFM - RM for Microsoft SQL Server was running in an imperfect condition for the period from the output of KAVE03002-I to the output of KAVE03003-I.

■ The status of the connection with PFM - Manager changes (ExternalService)

- Output host: PFM - RM host
- Output component: Remote Monitor Collector service and Remote Monitor Store service

Item name	Attribute name	Value
Message ID	msgid	Sending of an event to PFM - Manager failed (queuing was started): KAVE03300-I An event was resent to PFM - Manager: KAVE03301-I

#1

No fixed output items are output.

#2

When sending of an event to PFM - Manager fails, Remote Monitor Store service starts queuing events. The maximum capacity of the queue is 3 events. KAVE03300-I is output when sending of an event to PFM - Manager fails and queuing starts. After the connection with PFM - Manager restores and the queued events are resent, KAVE03301-I is output. From this sequence of the log, you can judge that the period when an event-sending to PFM - Manager is not real time is specifiable.

#3

The Remote Monitor Collector service normally sends events to PFM - Manager via the Remote Monitor Store service. The Remote Monitor Collector service directly sends events to PFM - Manager only when the Remote Monitor Store service stops for any reason. If the Remote Monitor Collector service fails to send events directly to PFM - Manager, KAVE03300-I is output. In this case, KAVE03301-I is no output because the queuing does not start. From this sequence of the log, you can judge that there are events that are not sent to PFM - Manager.

■ An automated action is executed (ManagementAction)

- Output host: The host on which the action was executed
- Output component: Action Handler service

Item name	Attribute name	Value
Message ID	msgid	The command execution process was created successfully: KAVE03500-I. An attempt to create a command execution process failed: KAVE03501-W. E-mail was send successfully: KAVE03502-I. Sending of e-mail failed: KAVE03503-W
Free description	msg	Command execution: cmd=*executed-command-line*. E-mail sending: mailto=*destination-email-address*.

Note:

KAVE03500-I is output when the command execution process is successfully created. After KAVE03500-I is output, whether the command is successfully executed or not and the execution result are not output to the action log.

(4) Output example

The following is an example of action log output.

```
CALFHM 1.0, seqnum=1, msgid=KAVE03000-I, date=2007-01-18T22:46:49.682+09:00,
progid=JP1PFM, compid=OA1host01, pid=2076,
ocp:host=host01, ctgry=StartStop, result=Occurrence,
subj:pid=2076,op=Start,
```

J.4 Settings for outputting action logs

The settings for outputting action logs are defined in the jpccomm.ini file. If no settings are specified, no action logs are output. The following describes the settings required to output the action logs, and how to specify the settings.

(1) Setting procedure

To specify the settings for outputting action log information:

1. Stop all PFM services on the host.
2. Using a text editor, edit the jpccomm.ini file.
3. Save and close the jpccomm.ini file.

(2) Details about the jpccomm.ini file

The following describes the jpccomm.ini file in detail.

(a) Storage folder

installation-folder

(b) Format

In the jpccomm.ini file, define the following information:

- Whether or not to output action log information
- Output destination of the action log
- Number of action logs that can be saved
- File size of the action log

The specification format is as follows:

"*item-name*"=*value*

The following table shows the items that you specify.

Table J-4: Items specified in the jpccomm.ini file and their initial values

No.	Item	Explanation
1	`[Action Log Section]`	The section name, which cannot be changed.
2	`Action Log Mode`	Specify whether or not to output action log information. You must specify this item. • Initial value 0 (Information not output) • Specifiable value 0 (Information not output) or 1 (Information output) If any other value is specified, an error message is output and action log information will not be output.
3	`Action Log Dir`#	Specify the action log output destination. In a logical host environment, specify a directory on the shared disk. If the directory you specify is not on the shared disk, Performance Management will output action logs to each physical host that forms the basis for the logical host. If a path longer than the limit is specified or if access to the directory fails, an error message is output to the command log and action log information will not be output. • Initial value None set • Default value used when no specification is made On physical hosts: *installation-folder*`\auditlog\` On logical hosts: *environment-folder*`\jp1pc\auditlog\` • Specifiable value A character string of 1 to 185 bytes
4	`Action Log Num`	Specify the upper limit on the total number of log files (number of saved files). Specify the sum of the number of current output file and shift files. • Initial value • None set • Default value used when no specification is made: • 5 • Specifiable value An integer in the range from 2 to 10 If a character string containing a non-numeric value is specified, an error message is output and the default value 5 is set. If a numeric value outside the valid range is specified, an error message is output and an integer nearest the specified value in the range from 2 to 10 is set.
5	`Action Log Size`	Specify the log file size in kilobytes. • Initial value • None set • Default value used when no specification is made: • 2048 • Specifiable value An integer in the range from 512 to 2096128 If a character string containing a non-numeric value is specified, an error message is output and the default value 2048 is set. If a numeric value outside the valid range is

No.	Item	Explanation
5	`Action Log Size`	specified, an error message is output and an integer nearest the specified value in the range from 512 to 2096128 is set.

#

When you use the `jpcconf ha setup` command to set up a logical host after you configure action log output on the physical host, the settings in the jpccomm.ini file of the physical host apply to the logical host. When using Performance Management on a logical host and a physical host at the same time, make sure that both hosts do not output action logs to the same directory.

K. Linking with JP1/ITSLM

The capability of PFM - RM for Microsoft SQL Server to monitor operating status can be enhanced through linkage with JP1/ITSLM.

PFM - RM for Microsoft SQL Server provides default monitoring items specific to JP1/ITSLM for PFM - Manager to enable monitoring on JP1/ITSLM.

The default monitoring items provided by PFM - RM for Microsoft SQL Server for PFM - Manager are described in the following table.

In addition, PFM - RM for Microsoft SQL Server collects records corresponding to the value specified as the key for multi-instance records. For the corresponding collection key, see the collection result for each record.

Table K-1: Default monitoring items provided by PFM - RM for Microsoft SQL Server for PFM - Manager

Display name in JP1/ITSLM	Description	Record (Record ID)	Key (PFM-Manager name)	Field name
Cache Hit rate	Monitors the ratio of requests found in the data cache to disk read operations	Server Overview (PI_SERV)	--	CACHE_HIT_RATIO
CPU usage rate	Monitors the ratio of CPU consumption by the current session.	Global Server Summary (PI)	--	PERC_BUSY
Database free space rate	Monitors the percentage of free space in each database.	Database Space Detail (PD_DS)	DB_NAME, DBID	PERC_FREE
Log space usage rate	Monitors the percentage of transaction log space that is being used by the transaction log	Transaction Log Overview (PI_TLOG)	DB_NAME	LOG_SPACE_USED_PCT

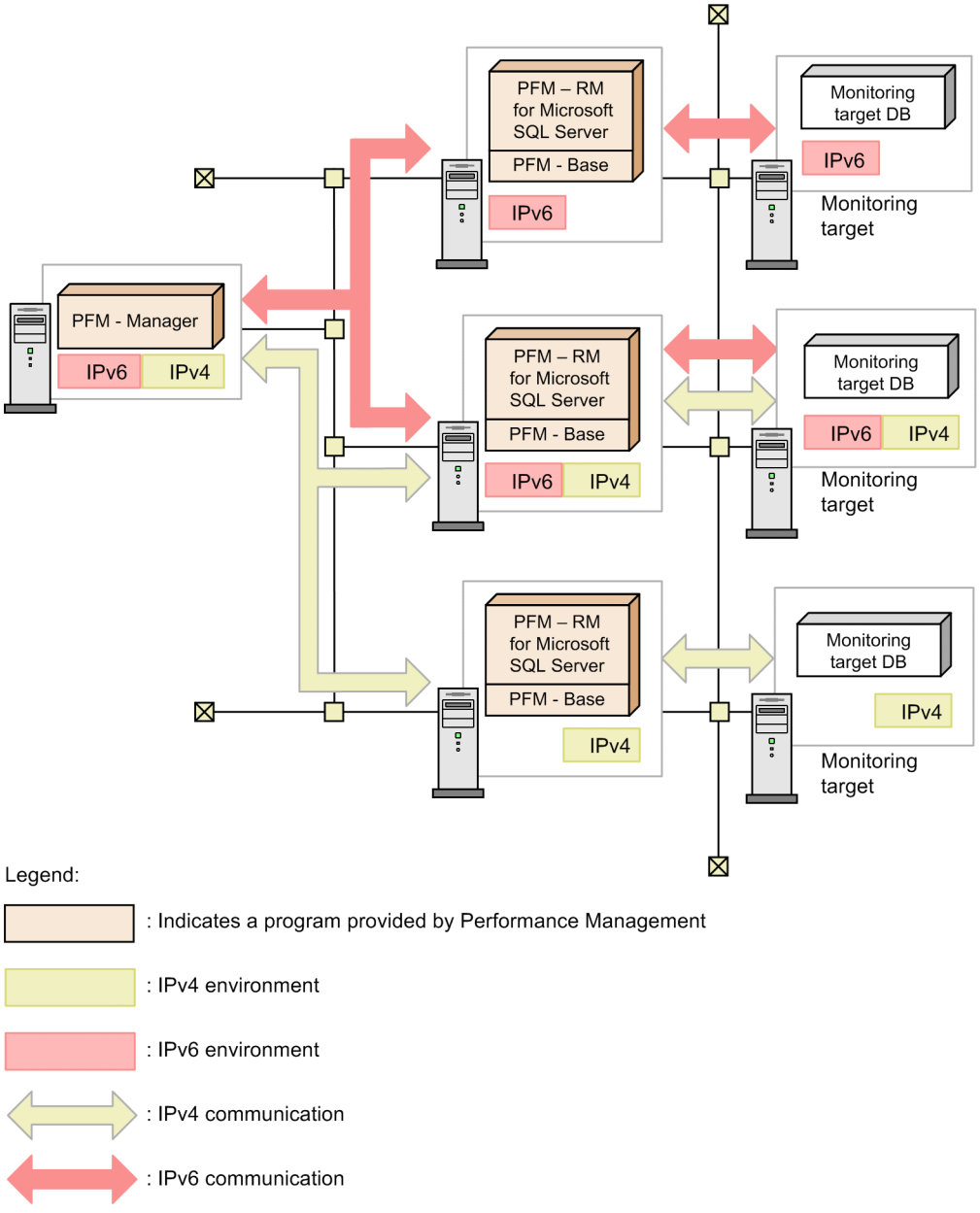
To provide the default monitoring items for PFM - Manager, you need to copy the setup file and execute the setup command. For details, see *2.1.4(1) Registering PFM - RM for Microsoft SQL Server*.

L. About Communication in IPv4 Environments and IPv6 Environments

Performance Management supports IPv6 environments in addition to IPv4 environments as a network configuration. Therefore, Performance Management can operate even in a network configuration in which both an IPv4 environment and IPv6 environment are used.

Note that this explanation applies only when the OS of a host on which PFM - RM for Microsoft SQL Server is installed is Windows Server 2008 R2 or Windows Server 2012, and the OS of a host on which PFM - Manager is installed is Windows Server 2008 R2, Windows Server 2012 or Linux.

Figure L-1: Scope of communication when an IPv4 environment and an IPv6 environment are used



To enable communication in an IPv6 environment, you must execute the `jpcconf ipv6 enable` command. For details about the `jpcconf ipv6 enable` command, see the chapter that describes commands in the manual *Job Management Partner 1/Performance Management Reference*. For the conditions and timing for executing the

`jpcconf ipv6 enable` command, see the chapter that describes network configuring examples in an IPv6 environment in the *Job Management Partner 1/Performance Management Planning and Configuration Guide.*

M. Version Revisions

M.1 Revisions in 10-00

- The following has been added as databases that can be monitored:
  - Microsoft SQL Server 2012
- LIMIT_PD_LD_NUMBER has been added to the monitoring target settings.
- Information about monitoring items for monitoring services through linkage with JP1/IT Service Level Management has been added. Also, a description of the following monitoring items has been added:
  - Cache Hit rate
  - CPU usage rate
  - Database free space rate
  - Log space usage rate
- Performance data can be collected in an IPv6 environment.
- The following messages have been added:
  - KAVL19849-W
  - KAVL19852-W

N. Reference Material for This Manual

This appendix provides reference information, including various conventions, for this manual.

N.1 Related publications

This manual is part of a related set of manuals. The manuals in the set are listed below (with the manual numbers):

Manuals associated with JP1/Performance Management:

- *Job Management Partner 1/Performance Management Planning and Configuration Guide* (3021-3-041(E))
- *Job Management Partner 1/Performance Management User's Guide* (3021-3-042(E))
- *Job Management Partner 1/Performance Management Reference* (3021-3-043(E))

Manuals associated with JP1:

- *Job Management Partner 1/Software Distribution Administrator's Guide Volume 1* (3020-3-S81(E)), for Windows systems
- *Job Management Partner 1/Software Distribution Manager Description and Administrator's Guide* (3000-3-841(E))
- *Job Management Partner 1/Software Distribution SubManager Description and Administrator's Guide* (3020-3-L42(E)), for UNIX systems
- *Job Management Partner 1/Software Distribution Client Description and User's Guide* (3020-3-S85(E)), for UNIX systems

N.2 Conventions: Abbreviations for product names

This manual uses the following abbreviations for product names:

Abbreviation		Full name or meaning
AIX		AIX 5L V5.3
		AIX V6.1
HP-UX	HP-UX 11i	HP-UX 11i V3 (IPF)
IPF		Itanium(R) Processor Family
JP1/IM	JP1/IM - Manager	Job Management Partner 1/Integrated Management - Manager
	JP1/IM - View	Job Management Partner 1/Integrated Management - View
JP1/ITSLM		Job Management Partner 1/IT Service Level Management
JP1/NETM/DM		Job Management Partner 1/Software Distribution Client
		Job Management Partner 1/Software Distribution Manager

Abbreviation			Full name or meaning
JP1/NETM/DM			Job Management Partner 1/Software Distribution SubManager
Linux	Linux (x64)	Linux 6 (x64)	Red Hat Enterprise Linux(R) Server 6 (64-bit x86_64)
	Linux (x86)	Linux 6 (x86)	Red Hat Enterprise Linux(R) Server 6 (32-bit x86)
NNM	HP NNM		HP Network Node Manager Software version 6 or earlier
			HP Network Node Manager Starter Edition Software version 7.5 or earlier
	JP1/Cm2/NNM		Job Management Partner 1/Cm2/ Network Node Manager version 7 or earlier
			Job Management Partner 1/Cm2/ Network Node Manager Starter Edition 250 version 8 or earlier
			Job Management Partner 1/Cm2/ Network Node Manager Starter Edition Enterprise version 8 or earlier
Performance Management			Job Management Partner 1/Performance Management
PFM - Agent	PFM - Agent for Enterprise Applications		Job Management Partner 1/Performance Management - Agent Option for Enterprise Applications
	PFM - Agent for Platform	PFM - Agent for Platform(UNIX)	Job Management Partner 1/Performance Management - Agent Option for Platform (UNIX)
		PFM - Agent for Platform(Windows)	Job Management Partner 1/Performance Management - Agent Option for Platform (Windows)
	PFM - Agent for Service Response		Job Management Partner 1/Performance Management - Agent

Abbreviation			Full name or meaning
PFM - Agent	PFM - Agent for Service Response		Option for Service Response
PFM - Base			Job Management Partner 1/Performance Management - Base
PFM - Manager			Job Management Partner 1/Performance Management - Manager
PFM - RM	PFM - RM for Microsoft SQL Server		Job Management Partner 1/Performance Management - Remote Monitor for Microsoft(R) SQL Server
	PFM - RM for Oracle		Job Management Partner 1/Performance Management - Remote Monitor for Oracle
	PFM - RM for Platform	PFM - RM for Platform(UNIX)	Job Management Partner 1/Performance Management - Remote Monitor for Platform (UNIX)
		PFM - RM for Platform(Windows)	Job Management Partner 1/Performance Management - Remote Monitor for Platform (Windows)
	PFM - RM for Virtual Machine		Job Management Partner 1/Performance Management - Remote Monitor for Virtual Machine
PFM - Web Console			Job Management Partner 1/Performance Management - Web Console
Solaris	Solaris 10		Solaris 10 (SPARC)

- PFM - Manager, PFM - Agent, PFM - Base, PFM - Web Console, and PFM - RM may be referred to collectively as *Performance Management*.
- HP-UX, Solaris, AIX, and Linux may be referred to collectively as *UNIX*.

N.3 Conventions: Acronyms

This manual also uses the following acronyms:

Acronym	Full name or meaning
API	Application Programming Interface
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System

Acronym	Full name or meaning
FQDN	Fully Qualified Domain Name
GUI	Graphical User Interface
HA	High Availability
IPv4	Internet Protocol Version 4
IPv6	Internet Protocol Version 6
LAN	Local Area Network
MFC	Microsoft Foundation Class
ODBC	Open DataBase Connectivity
OS	Operating System
SP	Service Pack
UAC	User Account Control
WOW64	Windows On Windows 64
WRP	Windows Resource Protection

N.4 Conventions: Product names, service IDs, and service keys

Performance Management version 09-00 or later can display the product name as the service ID and service key by enabling the product name display functionality.

Identifiers	Product name display functionality	
	Disabled	Enabled
Service ID	4S1 hostname	hostname<RMSQL>(Store)
	4A1 hostname	ostname<RMSQL>
Service Key	agt4	RMSQL

Hereafter in this manual, service IDs and service keys are shown in the format when the product name display functionality is enabled.

Note that you can enable the product name display functionality only when you satisfy the two conditions listed below:

- The version number of the prerequisite programs (PFM - Manager or PFM - Base) is 09-00 or later.
- The version number of PFM - Web Console and connection-target PFM - Manager is 09-00 or later.

N.5 Conventions: Installation folder

In this manual, the installation folder for the Windows version of Performance Management is indicated by *installation-folder*. The installation directory for the UNIX version of Performance Management is indicated by *installation-directory*.

The default installation folder for the Windows version of Performance Management is as follows:

Installation-folder for PFM - Base:

- For Windows Server 2003 (x64) and the 64-bit version of Windows Server 2008:
  system-drive`\Program Files(x86)\Hitachi\jp1pc`
- For other OSs:

system-drive\Program Files\Hitachi\jp1pc

This manual uses the term *installation folder* for the PFM - Base installation folder.

Installation-folder for PFM - Management:

- For Windows Server 2003 (x64) and the 64-bit version of Windows Server 2008:
  system-drive\Program Files(x86)\Hitachi\jp1pc
- For other OSs:
  system-drive\Program Files\Hitachi\jp1pc

Installation-folder for PFM - Web Console:

- For Windows Server 2003 (x64) and the 64-bit version of Windows Server 2008:
  system-drive\Program Files(x86)\Hitachi\jp1pcWebCon
- For other OSs:
  system-drive\Program Files\Hitachi\jp1pcWebCon

The default installation directory for the UNIX version of Performance Management is as follows:

Installation-directory for PFM - Base:
/opt/jp1pc

Installation-directory for PFM - Manager:
/opt/jp1pc

Installation-directory for PFM - Web Console:
/opt/jp1pcwebcon

N.6 Supported NNM products

Performance Management supports the cooperation with the following products:

- HP Network Node Manager Software version 6 or earlier
- HP Network Node Manager Starter Edition Software version 7.5 or earlier
- JP1/Cm2/Network Node Manager version 7 or earlier
- JP1/Cm2/Network Node Manager Starter Edition 250 version 8 or earlier
- JP1/Cm2/Network Node Manager Starter Edition Enterprise version 8 or earlier

Hereafter in this manual, "NNM" indicates the supported products listed above and "OpenView linkage facility" indicates the cooperative functionality with these products.

Note that Performance Management does not support the cooperative functionality with the products listed below:

- HP Network Node Manager i Software v8.10 or later
- JP1/Cm2/Network Node Manager i version 09-00 or later

N.7 Conventions: KB, MB, GB, and TB

This manual uses the following conventions:

- 1 KB (kilobyte) is 1,024 bytes.
- 1 MB (megabyte) is $1{,}024^2$ bytes.
- 1 GB (gigabyte) is $1{,}024^3$ bytes.
- 1 TB (terabyte) is $1{,}024^4$ bytes.

O. Glossary

action

An action executed automatically by Performance Management when the data being monitored reaches a threshold value. The following actions are supported:

- Sending an email
- Executing a command
- Issuing an SNMP trap
- Issuing a JP1 event

Action Handler

A PFM - Manager or PFM - Base service that executes actions.

alarm

Information that defines an action or event message that is triggered when the data being monitored reaches a threshold value.

alarm table

A table containing the following definition information about one or more alarms:

- Monitored object (process, TCP, Web service, and so on)
- Monitored information (CPU usage, number of bytes received per second, and so on)
- Monitored condition (threshold value)

binding

The process of associating alarms with an agent. Binding enables the user to be notified when the performance data collected by the agent reaches a threshold value defined in an alarm.

cluster system

A single system configured from multiple linked server systems. There are two major types of cluster systems: an HA (High Availability) cluster system and a load-balancing cluster system.

In this manual, a *cluster system* means an HA cluster system.

→ *HA cluster system*

→ *Load-balancing cluster system*

Correlator

A PFM - Manager service that controls event distribution between services. This service evaluates the alarm status, and sends an alarm event or agent event to the Trap Generator service and to PFM - Web Console if the alarm status exceeds a threshold value.

database ID

An ID attached to each record in PFM - RM, indicating the database in which the record is stored and the record type. The database ID may be either of the following:

- `PI`

  Indicates that the database contains records of the PI record type.
- `PD`

  Indicates that the database contains records of the PD record type.

data model

A generic term for the records and fields contained in a PFM - RM. Data models are versioned.

drilldown report

A report related to another report or to the fields in the report. A drilldown report can be used to display detailed information or related information for a report.

executing node

Of the server systems in a cluster system, the node that is currently executing applications (node whose logical host is active).

failover

The process by which the standby node takes over processing if a failure occurs on the node that is executing applications in a cluster system.

field

A set of performance data. One or more fields make up a record.

Function ID

A one-byte identifier indicating the function type of a service of Performance Management programs. This is part of the service ID.

HA cluster system

A cluster system designed to implement high availability by continuing operation even if one system fails. If a failure occurs on the server currently executing applications, a separate standby server takes over and continues the processing of applications. Accordingly, because application processing is not interrupted when a failure occurs, availability improves.

In this manual, a *cluster system* means an HA cluster system.

historical report

A report that tracks the status of an object being monitored from a point in the past to the present.

instance

In this manual, the term *instance* is used as follows.

- To indicate the format of a record:

  A record written on one line is known as a *single-instance record*. A record spanning multiple lines is known as a *multi-instance record*, each line of which is known as an *instance*.

- To indicate the number of PFM - RM:

  A single agent that monitors all the target objects on a host is known as a *single-instance agent*. Agents that share the monitoring of target objects on a host are known collectively as a *multi-instance agent*. Each of these agent services of a multi-instance agent is called an *instance*.

instance number

An identifier for management number used for internal processing. An instance number is part of the service ID.

JP1/ITSLM

A product that performs monitoring from the viewpoint of performance as experienced by the service users of a business system, and that supports service-level maintenance. Linkage with JP1/ITSLM can enhance monitoring of the operating status.

lifetime

The length of time that the consistency of the performance data collected in each record is retained.

load-balancing cluster system

A system that distributes the processing load over multiple nodes to improve throughput. Because processing switches to another node if an executing node stops due to a failure, this system also improves the availability of the system.

logical host

A logical server that provides the JP1 execution environment for operation in a cluster system. If a failure occurs on the executing node, the logical host is switched to the standby node. Each logical host has a unique IP address. At failover, the IP address is inherited by the standby node. Thus, when the physical server is failed over, clients can still access the logical host using the same IP address. To the clients, it appears that one server is operating continuously.

management tool

Any command or GUI-based function used to verify the status of a service or to manipulate performance data. Management tools allow you to:

- Display the configuration and status of a service
- Save and restore performance data
- Export performance data to a text file
- Delete performance data

Master Manager

A PFM - Manager service. This is the main service of PFM - Manager.

Master Store

A PFM - Manager service that manages the alarm events issued from each PFM - RM. This service uses a database to store the event data.

monitoring template

A set of predefined alarms and reports provided by PFM - RM. The monitoring template facilitates preparation for monitoring of the PFM - RM operation status without the user having to enter complex definitions.

multi-instance record

A record spanning multiple lines. This type of record has unique ODBC key fields.

→ *instance*

ODBC key field

A field required when using SQL from PFM - Manager or PFM - Base to reference data in the records stored in the Store database. Some ODBC key fields are common to all records; others are record-specific.

PD record type

→ *Product Detail record type*

performance data

Data about the operation status of a resource, collected from the system being monitored.

Performance Management

A generic term for a family of software products used to monitor and analyze problems related to system performance. Performance Management consists of the following five program products:

- PFM - Manager
- PFM - Web Console
- PFM - Base
- PFM - Agent
- PFM - RM

PFM - Agent

One of the program products in the Performance Management family. PFM - Agent is responsible for system monitoring. Several types of PFM - Agent are available, depending on the applications, database, and OS to be monitored. PFM - Agent provides the following features:

- Performance monitoring of target objects
- Collection and recording of data from monitored objects

PFM - Base

One of the program products in the Performance Management family. PFM - Base provides the core functionality for operation monitoring in Performance Management. It is a prerequisite product for running PFM - Agent and provides the following features:

- Commands and other management tools
- Common functions for linking Performance Management with another system

PFM - Manager

One of the program products in the Performance Management family. PFM - Manager performs supervisory functions and provides the following features:

- Management of the Performance Management program products
- Event management

PFM - Manager name

A field name that identifies the field in the Store database that stores the reference data. Use this name, for example, when you execute any command with the field name in the Store database.

PFM - RM

One of the program products in the Performance Management family. PFM - RM is responsible for system monitoring. Several types of PFM - RM are available, depending on the applications, database, and OS to be monitored. PFM - RM provides the following features:

- Performance monitoring of target objects

- Collection and recording of data from monitored objects

PFM - RM host

A host on which PFM - RM for Microsoft SQL Server has been installed.

PFM - View name

Alias name for PFM - Manager name. PFM - View name is more intuitive than PFM - Manager name. For example, "INPUT_RECORD_TYPE" (PFM - Manager name) is "Record Type"(PFM - View name). Use this field name, for example, when you specify the field name in the PFM - Web Console windows.

PFM - Web Console

One of the program products in the Performance Management family. PFM - Web Console operates as a Web application server to enable centralized monitoring of the Performance Management system via a web browser. It provides the following features:

- Display in a graphical user interface
- Integrated monitoring and management
- Definition of reports and alarms

physical host

An environment unique to each server in a cluster system. When a failover occurs, the environment of the physical host is not inherited by the other server.

PI record type

→ *Product Interval record type*

Product Detail record type

A type of record for storing performance data indicating the system status at a specific point in time, such as detail information about the currently running process. PD records can be used to acquire system statuses such as the following at a specific point in time:

- System operation status
- Amount of file system capacity currently in use

product ID

A one-byte ID indicating the Performance Management program product to which the service of the Performance Management program belongs. A product ID is part of the service ID.

Product Interval record type

A type of record for storing performance data at set intervals, such as a process count every minute. PI records can be used to analyze such time-based changes and trends in the system status such as the following:

- Number of system calls generated within a set time period
- Changes in the amount of file system capacity used

real-time report

A report that shows the current status of an object being monitored.

record

The format in which collected performance data is stored. The record type depends on the type of Store database.

report

Information defined for graphical display of the performance data collected by PFM - RM. The main types of information you can define are as follows:

- The records to be displayed in a report
- The performance data items to be displayed
- The display format of performance data (table, graph, and so on)

Remote Monitor Collector

A PFM - RM service that collects performance data and evaluates the data according to the threshold values set in alarms.

Remote Monitor Store

A PFM - RM service that stores performance data in a database. A separate Remote Monitor Store service is provided with each PFM - RM.

service ID

A unique ID assigned to each service of the Performance Management programs. You must specify the service ID when you execute a command to check the Performance Management system configuration or to back up performance data of an agent, for example. The format of the service ID differs depending on the setting of the product name display functionality. For details about the format of the service ID, see the chapter on Performance Management functionalities in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

single-instance record

A record written on a single line. This type of record does not have any unique ODBC key fields.

→ *instance*

stand-alone mode

A PFM - RM activated as a stand-alone program. If either of the PFM - Manager services Master Manager or Name Server is disabled due to a failure or another problem, you can still collect performance data by starting PFM - RM.

standby node

Of the server systems in a cluster system, a node that is waiting to take over applications if the executing node fails.

Store database

A database containing performance data collected by the Remote Monitor Collector service.

Monitored host

A host that PFM - RM for Microsoft SQL Server monitors.

Non-interactive (command)

Command execution method in which operator input required for command execution are provided by values in option specifications or in definition files.

Executing a command non-interactively saves work when configuring an operation monitoring system and can reduce user workload.

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