

Job Management Partner 1 Version 10

**Job Management Partner 1/Performance  
Management - Remote Monitor for Virtual Machine  
Description, User's Guide and Reference**

**3021-3-353-01(E)**

## Notices

### ■ 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

The above product includes the following:

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

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

*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:

P-CC242C-ARAL Job Management Partner 1/Performance Management - Web Console version 10-00 (For Windows Server 2003)

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 Virtual Machine (For Windows):*

P-2W2C-GVAL Job Management Partner 1/Performance Management - Remote Monitor for Virtual Machine version 10-00

The above product includes the following:

P-CC242C-GVAL Job Management Partner 1/Performance Management - Remote Monitor for Virtual Machine version 10-00 (For Windows Server 2003)

P-CC2A2C-GVAL Job Management Partner 1/Performance Management - Remote Monitor for Virtual Machine version 10-00 (For Windows Server 2008, Windows Server 2012)

These products include the parts developed under licenses from other companies.

## ■ Export restrictions

If you export this product, please check all restrictions (for example, Japan's Foreign Exchange and Foreign Trade Law, and USA export control laws and regulations), and carry out all required procedures.

If you require more information or clarification, please contact your Hitachi sales representative.

## ■ Trademarks

Active Directory is either a registered trademark or a trademark of Microsoft Corporation in the United States and/or other countries.

AIX is a trademark of International Business Machines Corporation in the United States, other countries, or both.

AMD, AMD Opteron, and combinations thereof, are trademarks of Advanced Micro Devices, Inc.

BEA is a registered trademark of BEA Systems, Inc.

DB2 is a trademark of International Business Machines Corporation in the United States, other countries, or both.

HP-UX is a product name of Hewlett-Packard Development Company, L.P. in the U.S. and other countries.

IBM is a trademark of International Business Machines Corporation in the United States, other countries, or both.

Internet Explorer is either a registered trademark or trademark of Microsoft Corporation in the United States and/or other countries.

Itanium is a trademark of Intel Corporation in the United States and other countries.

Linux is the registered trademark of Linus Torvalds in the U.S. and other countries.

Lotus is a registered trademark, and Domino is a trademark of Lotus Development Corporation and/or IBM Corporation in the United States, other countries, or both.

Lotus is a trademark of International Business Machines Corporation in the United States, other countries, or both.

Microsoft and Hyper-V are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

Microsoft and SQL Server are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

Microsoft Exchange server is a product name of Microsoft Corp. in the U.S. and other countries.

ODBC is Microsoft's strategic interface for accessing databases.

Oracle and Java are registered trademarks of Oracle and/or its affiliates.

Red Hat is a trademark or a registered trademark of Red Hat Inc. in the United States and other countries.

RPM is an abbreviation of RPM Package Manager.

SOAP is an XML-based protocol for sending messages and making remote procedure calls in a distributed environment.

All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc., in the United States and other countries. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc.

UNIX is a registered trademark of The Open Group in the United States and other countries.

VMware, VMware vSphere, VMware vSphere ESX and VMware vSphere Storage vMotion are registered trademarks or trademarks of VMware, Inc. in the United States and/or other jurisdictions.

WebSphere is a trademark of International Business Machines Corporation in the United States, other countries, or both.

Win32 is either a registered trademark or a trademark of Microsoft Corporation in the United States and/or other countries.

Windows is either a registered trademark or a trademark of Microsoft Corporation in the United States and/or other countries.

Windows Server is either a registered trademark or a trademark of Microsoft Corporation in the United States and/or other countries.

The following program products contain some parts whose copyrights are reserved by Oracle and/or its affiliates: P-9D2C-AAAL.

The following program products contain some parts whose copyrights are reserved by UNIX System Laboratories, Inc.: P-9D2C-AAAL.

Other product and company names mentioned in this document may be the trademarks of their respective owners. Throughout this document Hitachi has attempted to distinguish trademarks from descriptive terms by writing the name with the capitalization used by the manufacturer, or by writing the name with initial capital letters. Hitachi cannot attest to the accuracy of this information. Use of a trademark in this document should not be regarded as affecting the validity of the trademark.

## ■ Microsoft product screen shots

Microsoft product screen shots reprinted with permission from Microsoft Corporation.

## ■ Microsoft product name abbreviations

This manual uses the following abbreviations for Microsoft product names.

Abbreviation		Full name or meaning
Hyper-V	2008 Hyper-V	Microsoft(R) Windows Server(R) 2008 Hyper-V(R)
	2008 R2 Hyper-V	Microsoft(R) Windows Server(R) 2008 R2 Hyper-V(R)
	2012 Hyper-V	Microsoft(R) Windows Server(R) 2012 Hyper-V(R)
	2012 R2 Hyper-V	Microsoft(R) Windows Server(R) 2012 R2 Hyper-V(R)
Internet Explorer		Microsoft(R) Internet Explorer(R)
		Windows(R) Internet Explorer(R)
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		Microsoft(R) Windows Server(R) 2008 Enterprise
		Microsoft(R) Windows Server(R) 2008 Standard
		Microsoft(R) Windows Server(R) 2008 R2 Datacenter
		Microsoft(R) Windows Server(R) 2008 R2 Enterprise
		Microsoft(R) Windows Server(R) 2008 R2 Standard
Windows Server 2012	Windows Server 2012	Microsoft(R) Windows Server(R) 2012 Standard
		Microsoft(R) Windows Server(R) 2012 Datacenter
	Windows Server 2012 R2	Microsoft(R) Windows Server(R) 2012 R2 Standard
		Microsoft(R) Windows Server(R) 2012 R2 Datacenter
WSFC		Microsoft(R) Windows Server(R) Failover Cluster

*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

Information in this document is subject to change without notice and does not represent a commitment on the part of Hitachi. The software described in this manual is furnished according to a license agreement with Hitachi. The license agreement contains all of the terms and conditions governing your use of the software and documentation, including all warranty rights, limitations of liability, and disclaimers of warranty.

Material contained in this document may describe Hitachi products not available or features not available in your country.

No part of this material may be reproduced in any form or by any means without permission in writing from the publisher.



## ■ Issued

Mar. 2015: 3021-3-353-01(E)

## ■ Copyright

Copyright (C) 2013, 2015, Hitachi, Ltd.

Copyright (C) 2013, 2015, Hitachi Solutions, Ltd.

## Summary of amendments

The following table lists changes in this manual (3021-3-353-01(E)) and product changes related to this manual.

Changes	Location
Added a description of setting for monitoring the VMware with Hyper-Threading enabled.	<i>2.1.4, 2.3, 2.7.1, 3.3.4, Appendix G.4, Appendix M</i>
Added a description of data sources of the record.	<i>Appendix L</i>

In addition to the above changes, minor editorial corrections were made.

## Preface

This manual describes the functions of Job Management Partner 1/Performance Management - Remote Monitor for Virtual Machine and the records it collects.

In this manual, *Job Management Partner 1* is abbreviated to *JPI*.

### ■ 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 use monitoring results to consider what actions should be taken or delegated to improve the system.

Also, this manual assumes that the reader is familiar with operations and virtual environments of monitored systems and that the reader is knowledgeable about the OS.

For details about how to configure and operate a system that uses JPI/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 is organized into the following parts:

#### PART 1: Overview

Part 1 provides an overview of JPI/Performance Management - Remote Monitor for Virtual Machine.

#### PART 2: Setup and Operation

Part 2 explains how to install and set up JPI/Performance Management - Remote Monitor for Virtual Machine, and how to operate it in a cluster system.

#### PART 3: Reference

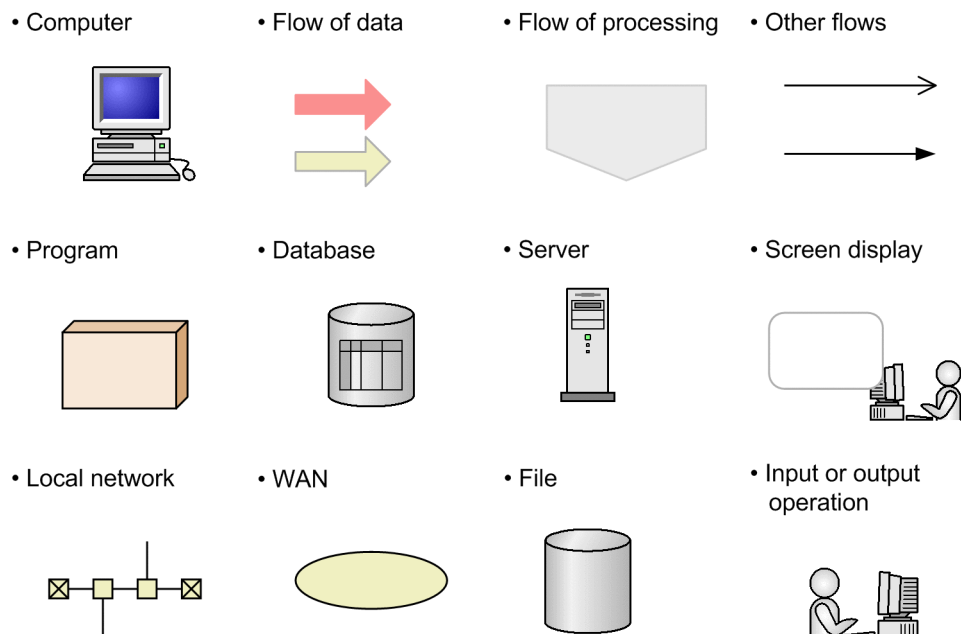
Part 3 explains the monitoring templates, records, and messages of JPI/Performance Management - Remote Monitor for Virtual Machine.

## PART 4: Troubleshooting

Part 4 explains the actions to take when problems occur in JP1/Performance Management - Remote Monitor for Virtual Machine.

### ■ Conventions: Diagrams

This manual uses the following conventions in diagrams:



### ■ Conventions: Fonts and symbols

The following table explains the text formatting conventions used in this manual:

Text formatting	Convention
<b>Bold</b>	<p>Bold characters indicate text in a window, other than the window title. Such text includes menus, menu options, buttons, radio box options, or explanatory labels. For example:</p> <ul style="list-style-type: none"><li>• From the <b>File</b> menu, choose <b>Open</b>.</li><li>• Click the <b>Cancel</b> button.</li><li>• In the <b>Enter name</b> entry box, type your name.</li></ul>
<i>Italic</i>	<p>Italic characters indicate a placeholder for some actual text to be provided by the user or system. For example:</p> <ul style="list-style-type: none"><li>• Write the command as follows: <code>copy source-file target-file</code></li><li>• The following message appears: <code>A file was not found. (file = file-name)</code></li></ul> <p>Italic characters are also used for emphasis. For example:</p> <ul style="list-style-type: none"><li>• Do <i>not</i> delete the configuration file.</li></ul>
Monospace	<p>Monospace characters indicate text that the user enters without change, or text (such as messages) output by the system. For example:</p> <ul style="list-style-type: none"><li>• At the prompt, enter <code>dir</code>.</li><li>• Use the <code>send</code> command to send mail.</li></ul>

Text formatting	Convention
Monospace	<ul style="list-style-type: none"> <li>The following message is displayed: The password is incorrect.</li> </ul>

The following table explains the symbols used in this manual:

Symbol	Convention
	In syntax explanations, a vertical bar separates multiple items, and has the meaning of OR. For example: A   B   C means A, or B, or C.
{ }	In syntax explanations, curly brackets indicate that only one of the enclosed items is to be selected. For example: { A   B   C } means only one of A, or B, or C.
[ ]	In syntax explanations, square brackets indicate that the enclosed item or items are optional. For example: [ A ] means that you can specify A or nothing. [ B   C ] means that you can specify B, or C, or nothing.
...	In coding, an ellipsis (...) indicates that one or more lines of coding have been omitted. In syntax explanations, an ellipsis indicates that the immediately preceding item can be repeated as many times as necessary. For example: A, B, B, ... means that, after you specify A, B, you can specify B as many times as necessary.
x	Multiplication sign
/	Division sign

## ■ 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

Notices	2
Summary of amendments	7
Preface	8

## Part 1: Overview

<b>1</b>	<b>Overview of PFM - RM for Virtual Machine</b>	<b>18</b>
1.1	Purpose of performance monitoring using PFM - RM for Virtual Machine	19
1.2	Features of PFM - RM for Virtual Machine	23
1.2.1	Collecting performance data from a virtual environment	23
1.2.2	Collecting performance data according to its characteristics	24
1.2.3	Saving the performance data	24
1.2.4	Alerting the user about an operational problem in the virtual environment	25
1.2.5	Defining reports and alarms easily	25
1.2.6	Operations in a cluster system	25
1.3	Overview of collecting and managing performance data	27
1.3.1	General procedure for performance data collection tasks	27
1.3.2	Differences in performance data collection from PFM - Agent for Virtual Machine	30
1.4	Example of performance monitoring operation using PFM - RM for Virtual Machine (for VMware)	31
1.4.1	System resources that are important for performance monitoring in a VMware system	31
1.4.2	Selecting a baseline	31
1.4.3	Monitoring the CPU resource	32
1.4.4	Monitoring the memory resource	36
1.4.5	Monitoring disk resources	40
1.4.6	Monitoring the network resources	46
1.5	Example of performance monitoring operation using PFM - RM for Virtual Machine (for Hyper-V)	50
1.5.1	System resources that are important for performance monitoring in a Hyper-V system	50
1.5.2	Selecting a baseline	50
1.5.3	Monitoring the CPU resource	50
1.5.4	Monitoring the memory resource	54
1.5.5	Monitoring disk resources	55
1.5.6	Monitoring the network resources	59
1.6	Example of performance monitoring operation using PFM - RM for Virtual Machine (for KVM)	63
1.6.1	System resources that are important for performance monitoring in a KVM system	63
1.6.2	Selecting a baseline	63
1.6.3	Monitoring the CPU resource	63
1.6.4	Monitoring the memory resource	66

- 1.6.5 Monitoring disk resources 68
- 1.6.6 Monitoring the network resources 70
- 1.7 Description of compound report settings 74

## Part 2: Setup and Operation

### 2 Installation and Setup 75

- 2.1 Installation and setup 76
  - 2.1.1 Before installation and setup 76
  - 2.1.2 Installation and setup flow 86
  - 2.1.3 Installation procedure 87
  - 2.1.4 Setting up PFM - RM for Virtual Machine 89
- 2.2 Uninstallation and unsetup 110
  - 2.2.1 Before uninstallation and unsetup 110
  - 2.2.2 Unsetup procedure 111
  - 2.2.3 Uninstallation procedure 113
- 2.3 Changing the PFM - RM for Virtual Machine system configuration 115
- 2.4 Changing the PFM - RM for Virtual Machine operation method 116
  - 2.4.1 Changing the performance data storage destination 116
  - 2.4.2 Updating an instance environment 117
  - 2.4.3 Updating monitoring targets 120
- 2.5 Settings for each virtual environment 123
  - 2.5.1 For VMware 123
  - 2.5.2 For Hyper-V 136
  - 2.5.3 For KVM 159
- 2.6 Examples of setting up an instance environment and monitoring targets 167
  - 2.6.1 For VMware 167
  - 2.6.2 For Hyper-V 170
  - 2.6.3 For KVM 173
- 2.7 Backing up and restoring 177
  - 2.7.1 Backing up 177
  - 2.7.2 Restoring 178
- 2.8 Settings for using a Web browser to reference manuals 179
  - 2.8.1 Setup procedure 179
  - 2.8.2 Viewing procedure 180

### 3 Operations in a Cluster System 181

- 3.1 Overview of cluster systems 182
  - 3.1.1 Configuring PFM - RM for Virtual Machine in an HA cluster system 182
- 3.2 Processing when a failover occurs 184
  - 3.2.1 Failover when an error occurs on the PFM - RM host 184
  - 3.2.2 Effects when PFM - Manager stops 184



3.3	Installation and setup	186
3.3.1	Before installation and setup	186
3.3.2	Installation and setup flow	189
3.3.3	Installation procedure	190
3.3.4	Setup procedure	191
3.4	Uninstallation and unsetup	200
3.4.1	Uninstallation and unsetup flow	200
3.4.2	Unsetup procedure	201
3.4.3	Uninstallation procedure	205
3.5	Changing the PFM - RM for Virtual Machine system configuration	206
3.6	Changing the PFM - RM for Virtual Machine operation method	207
3.6.1	Updating the instance environment settings	207
3.6.2	Updating monitoring targets	208
3.6.3	Exporting and importing the logical host environment definition file	209

## Part 3: Reference

<b>4</b>	<b>Monitoring Template</b>	<b>211</b>
	Overview of monitoring template	212
	Format of alarm explanations	213
	List of alarms	214
	Host Disk Usage	215
	Host Memory Usage	217
	VM CPU Insufficient	219
	VM Disk Abort Cmds	221
	VM Disk Usage	223
	VM Status	225
	Format of report explanations	227
	Organization of report folders	228
	List of reports	230
	Host CPU Used Status (Monthly Trend)	231
	Host CPU Used Status (Status Reporting/Daily Trend)	232
	Host CPU Used Status (Troubleshooting/Real-Time)	233
	Host CPU Used Status (Troubleshooting/Recent Past)	234
	Host Disk I/O (Troubleshooting/Real-Time)	235
	Host Disk I/O (Troubleshooting/Recent Past)	236
	Host Disk Used (Monthly Trend)	237
	Host Disk Used (Status Reporting/Real-Time)	238
	Host Disk Used Status (Troubleshooting/Real-Time)	239
	Host Memory Size (Troubleshooting/Real-Time)	240
	Host Memory Size (Troubleshooting/Recent Past)	241
	Host Memory Used (Monthly Trend)	242
	Host Memory Used (Status Reporting/Daily Trend)	243
	Host Memory Used (Troubleshooting/Real-Time)	244
	Host Memory Used (Troubleshooting/Recent Past)	245

Host Memory Used Status (Troubleshooting/Real-Time)	246
Host Memory Used Status (Troubleshooting/Recent Past)	247
Host Network Data (Monthly Trend)	248
Host Network Data (Troubleshooting/Real-Time)	249
VM CPU Allocation Value (Troubleshooting/Real-Time)	250
VM CPU Allocation Value (Troubleshooting/Recent Past)	251
VM CPU Insufficient (Monthly Trend)	252
VM CPU Insufficient (Status Reporting/Daily Trend)	253
VM CPU Insufficient (Troubleshooting/Real-Time)	254
VM CPU Insufficient (Troubleshooting/Recent Past)	255
VM CPU Used (Troubleshooting/Real-Time)	256
VM CPU Used (Troubleshooting/Recent Past)	257
VM CPU Used Status (Troubleshooting/Recent Past/Drilldown Only)	258
VM Disk Abort Commands (Monthly Trend)	259
VM Disk Abort Commands (Status Reporting/Real-Time)	260
VM Disk I/O (Troubleshooting/Real-Time)	261
VM Disk I/O (Troubleshooting/Recent Past)	262
VM Disk Used (Monthly Trend)	263
VM Disk Used (Status Reporting/Real-Time)	264
VM Disk Used Status (Troubleshooting/Real-Time)	265
VM Memory Allocation Value (Troubleshooting/Real-Time)	266
VM Memory Allocation Value (Troubleshooting/Recent Past)	267
VM Memory Used (Troubleshooting/Recent Past/Drilldown Only)	268
VM Memory Used Status (Troubleshooting/Recent Past/Drilldown Only)	269
VM Network Data (Monthly Trend)	270
VM Network Data (Troubleshooting/Real-Time)	271
VM Swap Used (Troubleshooting/Real-Time)	272
VM Swap Used (Troubleshooting/Recent Past)	273
VM Working Size - Total (Troubleshooting/Real-Time)	274
VM Working Size - Total (Troubleshooting/Recent Past)	275

## 5 **Records 276**

Data model	277
Format of record explanations	278
List of ODBC key fields	281
Summary rules	282
Grouping rules	284
List of data types	285
Field values	286
Fields that are added only when a record is recorded in the Store database	288
Notes on records	290
List of records	292
Host CPU Status (PI_HCI)	293
Host Logical Disk Status (PI_HLDI)	296
Host Memory Status (PI_HMI)	298
Host Network Status (PI_HNI)	302
Host Physical Disk Status (PI_HPDI)	304

Host Status Detail (PD)	307
Host Status (PI)	309
VM CPU Status (PI_VCI)	314
VM Logical Disk Status (PI_VLDI)	318
VM Memory Status (PI_VMI)	320
VM Network Status (PI_VNI)	325
VM Physical Disk Status (PI_VPDI)	328
VM Status Detail (PD_VM)	331
VM Status (PI_VI)	333

## **6 Messages 338**

6.1	Message format	339
6.1.1	Message output format	339
6.1.2	Message description format	340
6.2	Message output destinations	341
6.3	List of messages output to the Windows event log	346
6.4	Messages	347

## **Part 4: Troubleshooting**

## **7 Error Handling Procedures 376**

7.1	Error handling procedures	377
7.2	Troubleshooting	378
7.2.1	Setup and service startup	378
7.2.2	Command execution	381
7.2.3	Report definition	382
7.2.4	Alarm definitions	382
7.2.5	Performance data collection and management	383
7.2.6	Other problems	388
7.3	Log information	389
7.3.1	Log information types	389
7.3.2	Log file and folder list	390
7.4	Data collected when a problem occurs	393
7.4.1	In Windows	393
7.5	How to collect data	398
7.5.1	In Windows	398
7.6	Detecting problems within Performance Management	401
7.7	Recovering from Performance Management system errors	402

## **Appendixes 403**

A	Estimating System Requirements	404
A.1	Memory requirement	404
A.2	Disk occupancy	404

B	List of Identifiers	405
C	List of Processes	406
D	List of Port Numbers	407
D.1	Port numbers of PFM - RM for Virtual Machine	407
D.2	Firewall passage direction	407
E	Properties of PFM - RM for Virtual Machine	412
E.1	Remote Monitor Store service property list	412
E.2	Remote Monitor Collector service property list	414
E.3	Remote agent and group agent property list	421
F	List of Files and Folders	426
F.1	PFM - RM for Virtual Machine file and folder list	426
G	Migration from PFM - Agent for Virtual Machine to PFM - Remote Monitor for Virtual Machine	433
G.1	Preparation for migration	434
G.2	Migration in a non-cluster environment	436
G.3	Migration in a cluster environment	438
G.4	Notes on performing migration	439
G.5	Command reference	441
G.6	Property settings of the Collector and Store services	449
G.7	Items that can be migrated when the -targetadd and -instupdate options are specified	451
G.8	Examples of executing the migration command	452
H	Version Compatibility	473
I	Outputting Action Log Data	474
I.1	Types of events that are output to action logs	474
I.2	Format for saving action logs	474
I.3	Action log output format	475
I.4	Settings for outputting action logs	479
J	Linkage with JP1/ITSMLM	482
K	About Communication in IPv4 Environments and IPv6 Environments	483
L	Data Sources of the Record	484
L.1	In VMware	484
L.2	In Hyper-V	502
L.3	In KVM	520
M	Fields Affected by Setting the PFM - RM for Virtual Machine	531
N	Reference Material for This Manual	533
N.1	Related publications	533
N.2	Conventions: Abbreviations for product names	533
N.3	Conventions: Acronyms	536
N.4	Conventions: Product names, service IDs, and service keys	537
N.5	Conventions: Directory names	538
N.6	Conventions: Installation folder	538
N.7	Supported NNM products	539

N.8	Conventions: KB, MB, GB, and TB	539
O	Glossary	540

## **Index 547**

# 1

## Overview of PFM - RM for Virtual Machine

This chapter provides an overview of PFM - RM for Virtual Machine.

## 1.1 Purpose of performance monitoring using PFM - RM for Virtual Machine

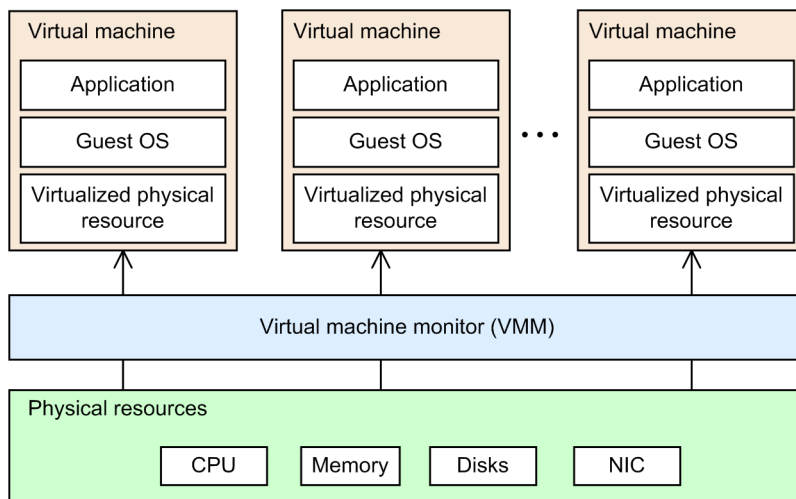
Server performance has improved in recent years to the point that it is often not possible for a single system to make full use of the resources of a single server. As a way to resolve this problem, more attention is being given to virtual environments because they can utilize system resources more effectively. Virtual environments also offer the following benefits:

- OSs and devices can be shared and centrally managed.
- Since fewer servers are used, power and air conditioning costs can be reduced.
- Multiple old servers can be replaced with a virtual machine on a single new server.

Reducing power and air conditioning costs by reducing the number of servers can also lead to a greener IT environment.

The following figure shows a typical structure of a virtual environment in which multiple virtual machines are configured on a single physical server.

Figure 1–1: Typical structure of a virtual environment



Each virtual machine runs on virtualized physical resources. A virtual environment reaches the highest possible efficiency level when its physical resources are utilized fully, and when there is no resource insufficiency. If physical resources are excessively consumed or are hardly being utilized, a virtual environment is not being used effectively. Therefore, it is important to decide what amount of physical resources should be allocated to each virtual machine.

PFM - RM for Virtual Machine is a program that monitors the performance of a virtual environment, and collects and manages performance data.

PFM - RM for Virtual Machine enables you to monitor the resource consumption status in various types of virtual environments. PFM - RM for Virtual Machine can monitor the following types of virtual environments:

- VMware ESX Server
- Hyper-V
- KVM

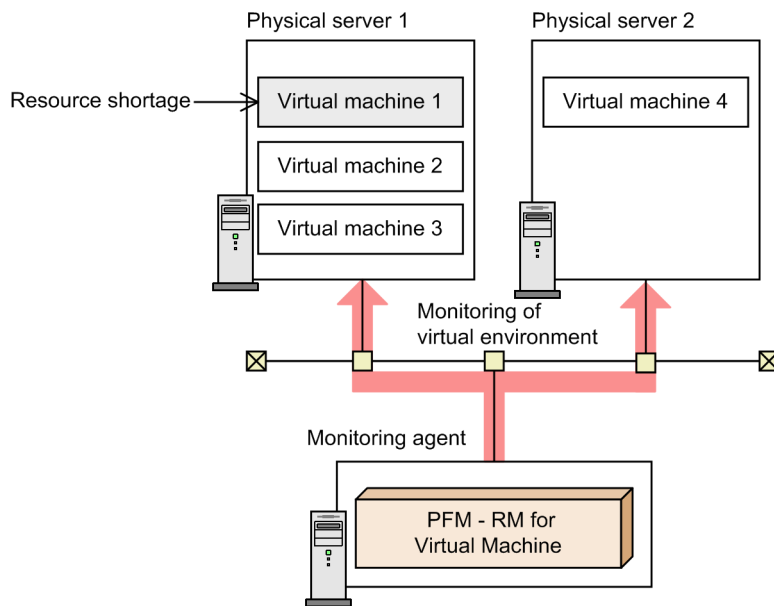
Resource monitoring is an important aspect of effective utilization of a virtual environment. Using PFM - RM for Virtual Machine, you can determine the degree to which a virtual environment is configured effectively by monitoring the

consumption of resources in the virtual environment. PFM - RM for Virtual Machine can monitor the following resources in a virtual environment:

- CPU
- Memory
- Disks
- Network

The following figure shows an example of using PFM - RM for Virtual Machine to monitor a VMware system.

**Figure 1–2: Monitoring a virtual environment with PFM - RM for Virtual Machine (monitoring a VMware system)**



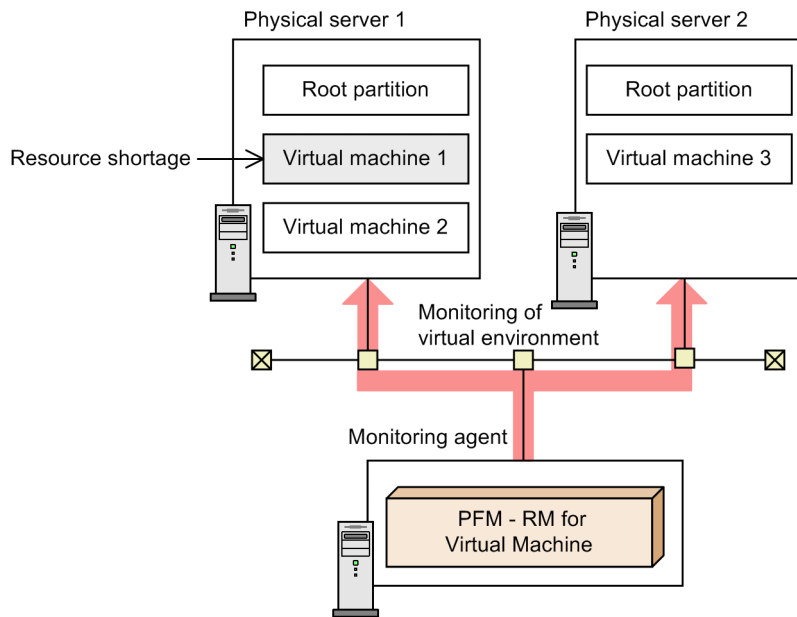
In this example, PFM - RM for Virtual Machine has detected a resource shortage in Virtual machine 1 on Physical server 1. In this case, the following corrective measures are possible:

- Increase the amount of Physical server 1 resources allocated to Virtual machine 1.
- Add resources to Physical server 1.
- Move Virtual machine 1 from Physical server 1 to Physical server 2, which has available resources.

The following figure shows an example of using PFM - RM for Virtual Machine to monitor a Hyper-V system.



**Figure 1–3: Monitoring a virtual environment with PFM - RM for Virtual Machine (monitoring a Hyper-V system)**

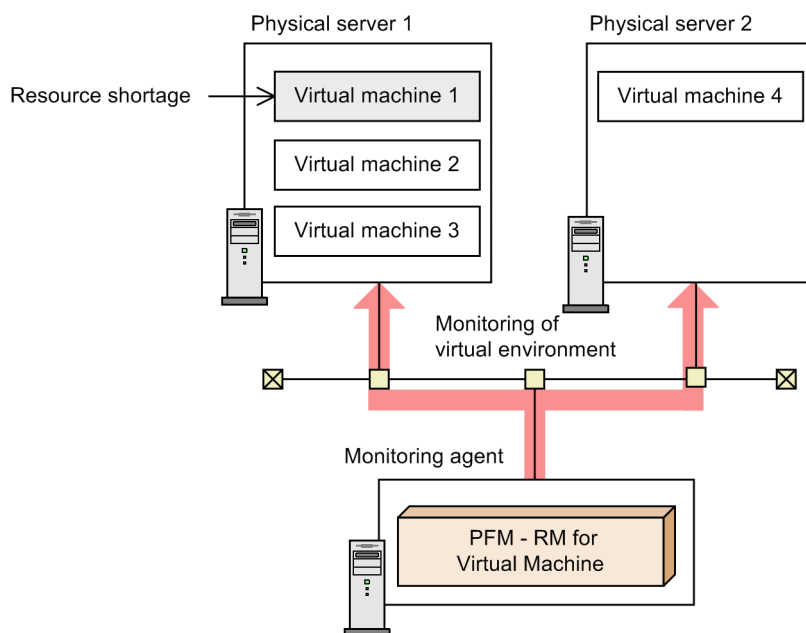


In this example, PFM - RM for Virtual Machine has detected a resource shortage in Virtual machine 1 on Physical server 1. In this case, the following corrective measures are possible:

- Increase the amount of Physical server 1 resources allocated to Virtual machine 1.
- Add resources to Physical server 1.
- Move Virtual machine 1 from Physical server 1 to Physical server 2, which has available resources.

The following figure shows an example of using PFM - RM for Virtual Machine to monitor a KVM system.

**Figure 1–4: Monitoring a virtual environment with PFM - RM for Virtual Machine (monitoring a KVM system)**



In this example, PFM - RM for Virtual Machine has detected a resource shortage in Virtual machine 1 on Physical server 1. In this case, the following corrective measures are possible:

- Increase the amount of Physical server 1 resources allocated to Virtual machine 1.
- Add resources to Physical server 1.
- Move Virtual machine 1 from Physical server 1 to Physical server 2, which has available resources.

By using PFM - RM for Virtual Machine to monitor a virtual environment, you can take appropriate corrective actions, making it possible to maintain an ideal virtual environment in which resource shortages and excesses do not occur.

## 1.2 Features of PFM - RM for Virtual Machine

PFM - RM for Virtual Machine is a program that monitors the performance of a virtual environment, and collects and manages its performance data.

This subsection describes the features of PFM - RM for Virtual Machine.

- **Analysis of the operation status of a virtual environment**  
PFM - RM for Virtual Machine collects and summarizes performance data, such as CPU usage and memory usage, from the monitored virtual environment, enabling the user to easily analyze the operation status of the virtual environment by graphically displaying its trends and history.  
PFM - RM for Virtual Machine creates an instance for each virtual machine in the virtual environment and monitors it. In this way, multiple virtual environments can be monitored.
- **Early detection of operational problems in a virtual environment and reporting of troubleshooting information**  
When a problem such as a resource shortage occurs in the monitored virtual environment, PFM - RM for Virtual Machine can quickly alert the user via e-mail, thus ensuring early problem detection. Furthermore, by graphically displaying the information related to the problem, PFM - RM for Virtual Machine provides the necessary troubleshooting data.

To use PFM - RM for Virtual Machine, you need PFM - Manager, PFM - Base, and PFM - Web Console. However, PFM - Base is not necessary if you install both PFM - Manager and PFM - RM for Virtual Machine on the same host.

### Reference note

In addition to PFM - RM for Virtual Machine, PFM - RM for Platform is a Performance Management product that can analyze the operation status of multiple hosts. Like PFM - RM for Virtual Machine, PFM - RM for Platform need not be installed on the host to be monitored. However, the types of performance data that PFM - RM for Platform can collect differ from those that can be collected by PFM - RM for Virtual Machine.

*Performance data that can be collected by PFM - RM for Virtual Machine*

- Operation status of physical servers
- Operation status of virtual machines

*Performance data that can be collected by PFM - RM for Platform*

- Operation status of Windows
- Operation status of UNIX

To collect and manage the operation status of an OS, consider installing PFM - RM for Platform.

The following subsections explain the tasks you can perform using PFM - RM for Virtual Machine.

### 1.2.1 Collecting performance data from a virtual environment

Using PFM - RM for Virtual Machine, you can collect performance data, such as the statistical information of a virtual environment that is running on the target physical server.

You can use the collected performance data for the following purposes:

- Graphically displaying the operation status of the virtual environment

You can use PFM - Web Console to process the performance data in a graphical format called a *report*, and display it. A report makes it easier to understand and analyze the operation status of the virtual environment.

The following types of reports are available:

- **Real-time report**  
This report shows the current status of the virtual environment being monitored. It is primarily used for checking the current state of the system and any problems that have occurred. Performance data is used immediately, at the time of its collection, to display a real-time report.
- **Historical report**  
This report shows the history of the virtual environment being monitored. It is primarily used for analyzing trends in the operation status of the system. Performance data stored in the database of PFM - RM for Virtual Machine is used to display a historical report.
- **Using the collected performance data to determine whether a problem has occurred**  
You can configure the system to take an action, such as notifying the user, if the collected performance data shows some sort of abnormality.

## 1.2.2 Collecting performance data according to its characteristics

Performance data is collected in the form of *records*. Each record is divided into smaller units called *fields*. Records and fields are collectively referred to as *data models*.

Records are grouped into two record types according to their characteristics. The type of performance data that is collected in each record type is defined by PFM - RM for Virtual Machine. You use PFM - Web Console to select the performance data records to collect.

The record types of PFM - RM for Virtual Machine are as follows.

- **Product Interval (PI) record type**  
For a record of the PI record type, performance data is collected for a given time interval, such as the CPU resources of a virtual machine used each minute. The PI record type is used to analyze changes and trends in the system status over time.
- **Product Detail (PD) record type**  
For a record of the PD record type, performance data is collected that indicates the system status at a given point in time, such as configuration information data about a virtual machine. The PD record type is used to determine the system status at a given point in time.

For details about each record, see [5. Records](#).

## 1.2.3 Saving the performance data

By storing the collected performance data in PFM - RM for Virtual Machine's database called the *Store database*, you can save performance data up to the present time and analyze historical trends in the operation status of the virtual environment. To analyze trends, you use a historical report.

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

## 1.2.4 Alerting the user about an operational problem in the virtual environment

Besides being used to display the performance of the virtual environment in the form of a report, performance data is used to alert the user when an operational problem or error occurs.

For example, when physical CPU usage rate exceeds 90%, an e-mail notification can be sent to the user. To send this notification, you set *usage of the physical CPU exceeds 90%* as the threshold for an abnormal condition, and you specify that an e-mail notification be sent to the user when this threshold is reached. The action that is taken when the threshold is reached is called an *action*. The following types of actions can be taken:

- E-mail notification
- Command execution
- SNMP trap issuance
- JP1 event issuance

An entity that defines a threshold and an action is called an *alarm*. A table that lists more than one alarm is called an *alarm table*. After you define an alarm table, you link it to PFM - RM for Virtual Machine. The act of linking an alarm table to PFM - RM for Virtual Machine is called *binding*. Once an alarm table is bound to PFM - RM for Virtual Machine, the user is notified when the performance data being collected by PFM - RM for Virtual Machine reaches the *threshold* defined by an alarm.

By defining alarms and actions in this way, you can discover operational problems in the virtual environment early, and take the necessary corrective actions.

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

## 1.2.5 Defining reports and alarms easily

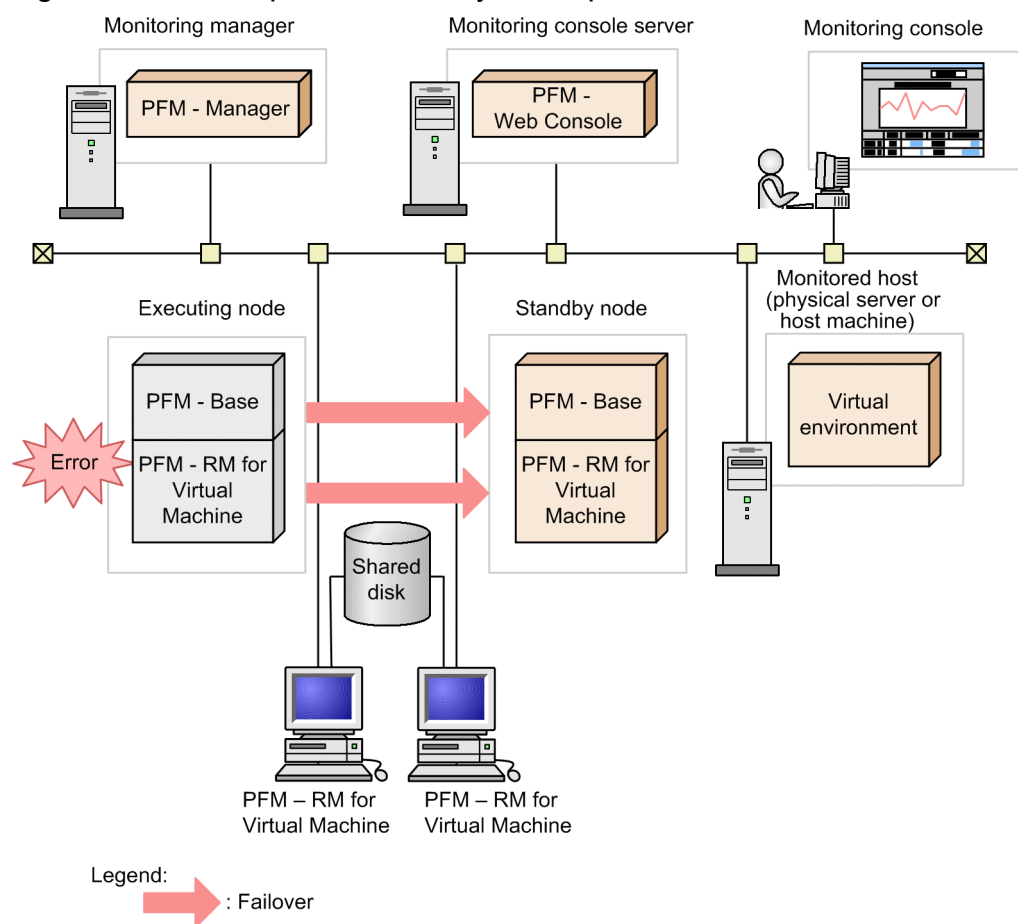
PFM - RM for Virtual Machine provides reports and alarms that predefine the necessary information, called *monitoring templates*. By using a monitoring template, you can easily prepare to monitor the operation status of the virtual environment without having to set up complicated definitions. A monitoring template can also be customized to fit the user's environment. For details about how to use a monitoring template, see the chapter that explains how to create reports for operational analysis or operation monitoring using alarms in the *Job Management Partner 1/Performance Management User's Guide*. For details about monitoring templates, see [4. Monitoring Template](#).

## 1.2.6 Operations in a cluster system

When a cluster system is used, you can configure a highly reliable system that can continue to operate even when an error occurs in it. This allows you to operate and monitor Performance Management around the clock.

The figure below shows an example of operations when an error occurs at the monitored host in a cluster system.

Figure 1–5: Example of cluster system operations



Two environments with identical settings are configured, and the host that normally runs is defined as the *executing node*, while the host that is used when an error occurs is defined as the *standby node*.

For details about Performance Management operations in a cluster system, see [3. Operations in a Cluster System](#).

## 1.3 Overview of collecting and managing performance data

---

The procedure for collecting and managing performance data differs depending on the type of record in which performance data is stored. Records in PFM - RM for Virtual Machine are classified according to 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 method

PFM - RM for Virtual Machine collects performance data from monitoring targets.

For the performance data collection method, see the chapter that explains the functions of Performance Management in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

For details about the values of collected performance data, see [5. Records](#).

- Performance data management method

PFM - RM for Virtual Machine manages performance data collected from monitoring targets.

For the performance data management method, see the chapter that explains the functions of Performance Management in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

You use PFM - Web Console to select which performance data to use out of the records collected and managed by PFM - RM. For the selection method, see the chapter that explains management of operation monitoring data in the *Job Management Partner 1/Performance Management User's Guide*.

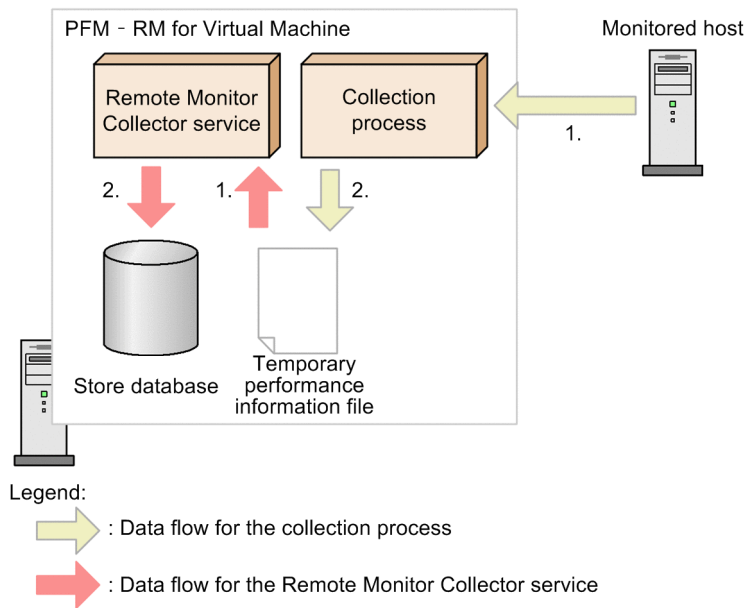
### 1.3.1 General procedure for performance data collection tasks

This subsection describes the flow of data and the general procedure for collecting performance data.

#### (1) Data flow during performance data collection

The following figure shows data flow that occurs when performance data is collected.

Figure 1–6: Data flow occurring during collection of performance data



- Data flow for the collection process
  1. The collection process connects to the monitored host, and collects performance data from the host.
  2. The collection process outputs the collected performance data to a temporary performance information file.
- Data flow for the Remote Monitor Collector service
  1. The Remote Monitor Collector service reads in the temporary performance information file that was output by the collection process.
  2. The Remote Monitor Collector service saves the performance data as records in the Store database.

The Remote Monitor Collector service and the collection process operate asynchronously.

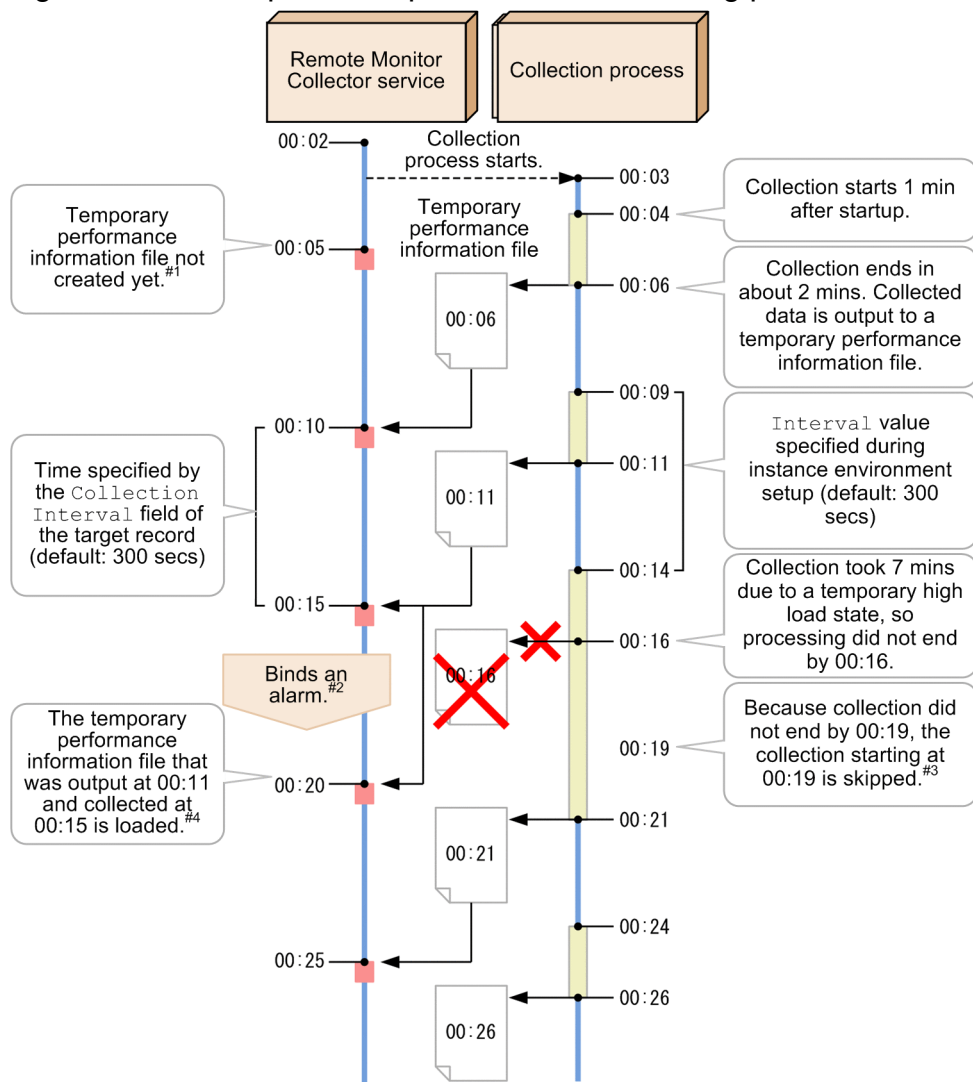
## (2) General procedure for collecting performance data

The Remote Monitor Collector service of PFM - RM for Virtual Machine collects records as specified by the `Collection Interval` setting of each record. The collection process operates based on the `Interval` setting specified during setup of the instance environment.

The following figure shows an example of the procedure for collecting performance data.



Figure 1–7: Example of the procedure for collecting performance data



Legend:

- ▶ : Control by the Remote Monitor Collector service
- ▶ : Flow of collected performance data
- : Processing performed by the Remote Monitor Collector service (performance data collection)
- : Processing performed by the Remote Monitor Collector service (alarm binding)
- : Processing performed by the collection process (performance data collection)

#1

Although performance data collection is to start at 00:05, the processing does not start and a KAVL20517-W message is output, because a temporary performance information file has not been created.

#2

If an alarm is bound in the period between collections at 00:15 and 00:20, whether to evaluate the alarm at 00:20 (first collection after the binding) depends on whether log data is collected by the record used by that alarm.

- If log data is collected by the record that is used by the bound alarm  
The alarm is not evaluated.
- If log data is not collected by the record that is used by the bound alarm  
The alarm is evaluated.

#3

Because the collection that started at 00:14 did not end by 00:19, the collection that was to start at 00:19 is skipped.

#4

During the collection at 00:20, in the same way as for the collection at 00:15, the temporary performance information file that was output at 00:15 is loaded.

If log data has been collected or the alarm is evaluated, no performance data is collected. At this time, a KAVL20516-W message is output.

For collection of data for a real-time report, the contents of the temporary performance information file that was output at 00:11 are displayed in the same way as for collection at 00:15.

### Reference note

- When performance data is stored in the Store database as log data, the data that was collected during the interval before the storage time is stored. The maximum time that is required from the time performance data collection starts until the data is stored in the Store database is approximately the `Interval` time specified during instance environment setup (the default is 300 seconds).
- When a real-time report is displayed, the contents of the temporary performance information file existing at that time are displayed. When a displayed real-time report is refreshed from PFM - Web Console, the display is updated to show the current contents of the temporary performance information file.
- Collection processing might be delayed depending on the number of monitored hosts and the load status during processing.
- Alarm evaluation is performed with performance data that was collected during the interval before the time at which evaluation is performed. The maximum time that is required from the time performance data collection starts until alarm evaluation ends is approximately the `Interval` time specified during instance environment setup (the default is 300 seconds).

Note that performance data collected during an earlier interval might be used for evaluation, depending on the alarm-binding time or collection delay, if the bound alarm does not use a record for which no log data is collected.

## 1.3.2 Differences in performance data collection from PFM - Agent for Virtual Machine

Before a PFM - RM for Virtual Machine instance can collect performance data, you must specify the `Interval` setting (collection process execution interval) during instance environment setup. Note that this setting does not exist in PFM - Agent for Virtual Machine.

PFM - Agent for Virtual Machine collects performance data at the interval specified by the `Collection Interval` property. PFM - RM for Virtual Machine executes the collection process at the interval specified by the `Interval` property (the default is 300 seconds) to create a temporary performance information file. PFM - RM for Virtual Machine then collects performance data from that file at the interval specified by the `Collection Interval` property (the default is 300 seconds). For this reason, the `Collection Interval` value must be larger than the `Interval` value.

If the value of the `Collection Interval` property is smaller than the value of the `Interval` property, performance data will be collected at the interval specified by the `Interval` property.

## 1.4 Example of performance monitoring operation using PFM - RM for Virtual Machine (for VMware)

---

To ensure the stability of operations in a system, it is important to monitor the system's performance and assess its status. This section explains how to use PFM - RM for Virtual Machine to monitor the performance of a VMware system.

### 1.4.1 System resources that are important for performance monitoring in a VMware system

The following are the system resources that are important when you use PFM - RM for Virtual Machine to monitor the performance of a VMware system.

- CPU resource (see [1.4.3](#))  
This is the CPU resource installed on the physical server. It is important for performance monitoring of CPU usage and other items.
- Memory resource (see [1.4.4](#))  
This is the memory resource installed on the physical server. It is important for performance monitoring of memory usage, swap usage, and other items.
- Disk resource (see [1.4.5](#))  
This is the disk resource installed on the physical server. It is important for performance monitoring of disk usage, disk I/O status, and other items.
- Network resource (see [1.4.6](#))  
This is the NIC resource installed on the physical server. It is important for performance monitoring of data send/receive speed and other items.

To set up definitions to monitor these important items, PFM - RM for Virtual Machine provides monitoring templates. Therefore, this section mainly explains monitoring methods that use monitoring templates. It also gives examples of compound report definition, which simplifies monitoring.

### 1.4.2 Selecting a baseline

Before you use a PFM product to monitor system performance, you must select a baseline.

To do this, you select a performance value based on the performance measurement results that is expected to not cause any problems in system operations.

A PFM product uses the baseline value as a threshold when it monitors the system performance. Therefore, selecting the baseline is an important task in performance monitoring.

When you select a baseline, consider the following points:

- We recommend that you measure the system's peak state during a situation such as a heavy workload test of the operating environment.
- The threshold varies greatly depending on the system configuration. Therefore, after you have modified the system resources or the operating environment, we recommend that you select a new baseline.

### 1.4.3 Monitoring the CPU resource

This subsection explains how to monitor the CPU resource of a VMware system.

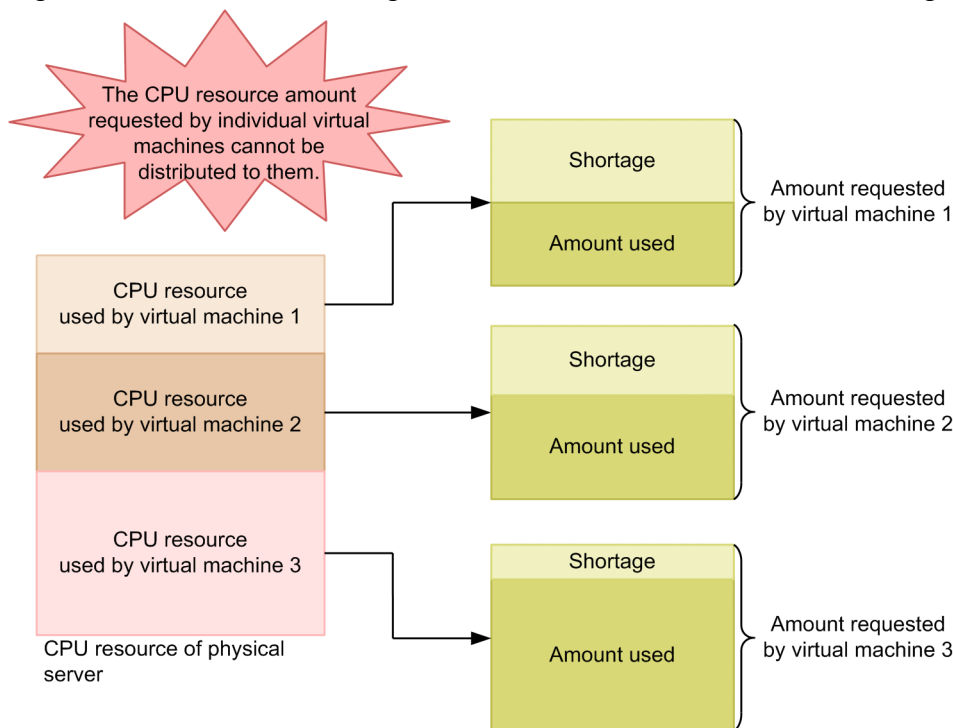
#### (1) Overview

In a VMware system, multiple virtual machines share the physical server's CPU. The CPU resource allocated to each virtual machine is called a *virtual CPU*. The OS running on a virtual machine recognizes a virtual CPU as a normal physical CPU.

The CPU resource of the physical server is distributed according to each virtual machine's CPU resource requirement. However, if the combined total of the CPU resource requirements for the individual virtual machines exceeds the CPU resource on the physical server, the required amount of CPU resource cannot be distributed, resulting in a virtual CPU resource shortage. This adversely affects the performance of the virtual machine.

The schematic diagram below shows a state in which a virtual CPU resource shortage has occurred.

Figure 1–8: Schematic diagram of a virtual CPU resource shortage



By monitoring CPU performance data, you can detect such performance deterioration in the virtual machines, and thus you can take appropriate corrective action.

Furthermore, in a virtual environment all physical devices are virtualized, such as memory, disks, and network interfaces. The CPU performs this virtualization of physical devices. Therefore, the CPU resource is an important resource that also affects the performance of other virtual devices.

The following four records are used to monitor the CPU resource. For details about records, see [5. Records](#).

1. `PI` record

This record is used to monitor the performance data of the physical server's CPU.

2. `PI_HCI` record

This record is used to monitor the performance data of each core of the physical CPU.

### 3. PI\_VI record

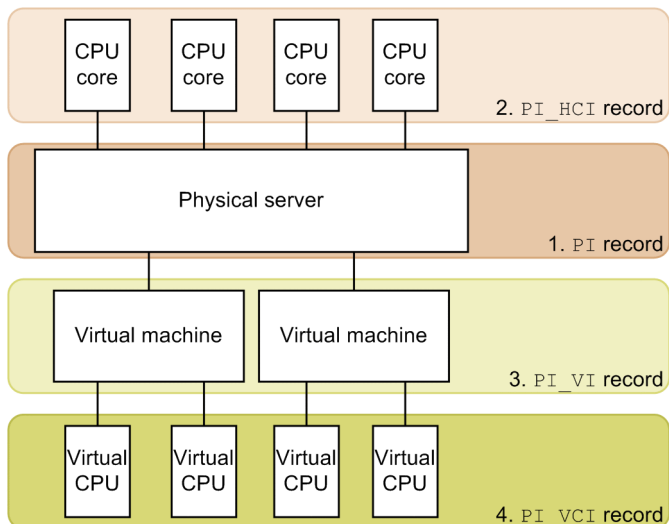
This record is used to monitor the performance data of the CPU that is being used by each virtual machine.

### 4. PI\_VCI record

This record is used to monitor the performance data of each virtual CPU.

The following figure shows the range of performance data collected in each record.

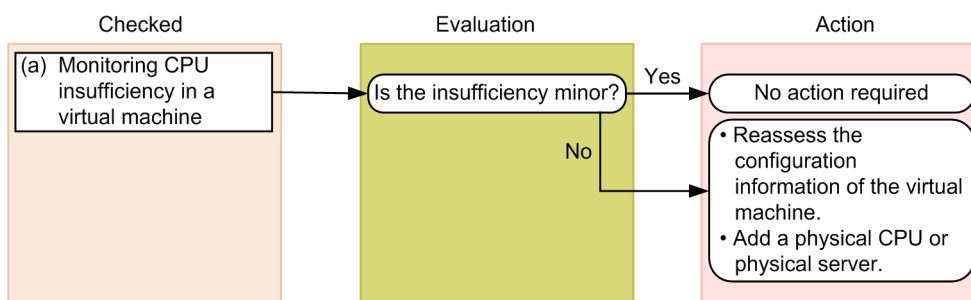
Figure 1–9: Range of performance data collected in each record



## (2) Monitoring examples

Using CPU resource monitoring on virtual machines `vhost1` and `vhost2` as an example, this subsection explains the factors that cause insufficient CPU resources, and how to solve this problem. The following figure shows the items monitored here and the flow of actions to take.

Figure 1–10: Monitored items and flow of actions

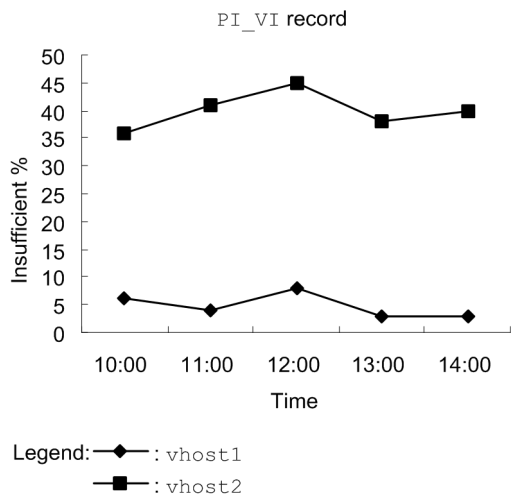


### (a) Example of monitoring CPU insufficiency in a virtual machine

You can monitor the virtual machine's CPU insufficiency in the Insufficient % field of the `PI_VI` record. If a sufficient amount of CPU resources have been allocated to the virtual machine, the CPU insufficiency approaches 0%. Note that you can monitor this item with an alarm provided in a monitoring template.

The figure below shows an example of monitoring CPU insufficiency in a virtual machine.

Figure 1–11: CPU insufficiency monitoring example



Monitoring template report to be checked

*VM CPU Insufficient*

Monitoring template alarm to be checked

*VM CPU Insufficient*

In this example, there appears to be severe insufficiency in the CPU resource of `vhost2`.

In this case, reassess the configuration information of the virtual machine. If the CPU insufficiency is still high even after the configuration information has been reassessed, consider either adding a CPU to the physical server or adding a physical server.

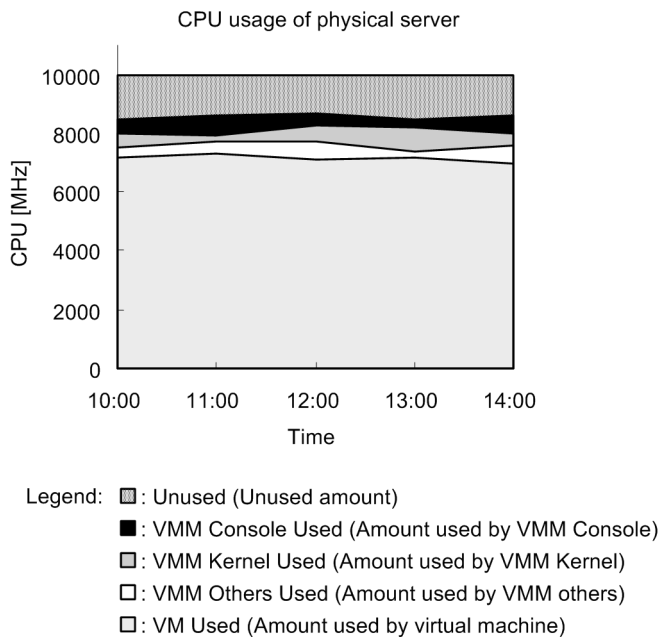
### (3) Other monitoring examples

Monitoring examples follow that use monitoring templates other than those explained in *1.4.3(2) Monitoring examples*.

(a) Checking the physical server's CPU usage status

■ Report that displays a physical server's CPU usage status

Figure 1–12: Example of monitoring a physical server's CPU usage status



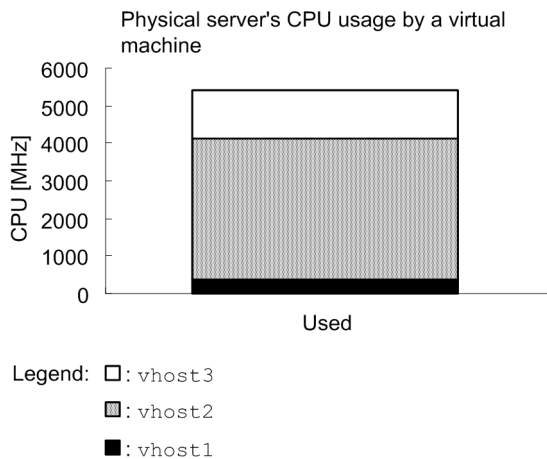
Monitoring template report to be checked

Host CPU Used Status

In this report, a drill-down feature is provided on the reports stored in the Troubleshooting/Recent Past folder. Clicking a virtual machine's usage plane on the graph displays the next report.

■ Report that displays a virtual machine's usage of a physical server's CPU

Figure 1–13: Example of monitoring a virtual machine's usage of a physical server's CPU



Monitoring template report to be checked

VM CPU Used Status

## 1.4.4 Monitoring the memory resource

This subsection explains how to monitor the memory resource of a VMware system.

### (1) Overview

In a VMware system, multiple virtual machines share the memory of the physical server. The memory resource allocated to each virtual machine is called *virtual memory*. The OS running on a virtual machine recognizes virtual memory as normal physical memory.

The memory resource of the physical server is distributed according to each virtual machine's memory resource requirement. However, if the combined total of the memory resource requirements of the individual virtual machines exceeds the memory resources on the physical server, the required amount of memory resources cannot be distributed, resulting in a virtual memory resource shortage. This adversely affects the performance of the virtual machine. By monitoring the memory performance data, you can detect such performance deterioration of the virtual machine.

Furthermore, in the virtual environment, *swapping* is used. Swapping means using some disk space as memory. Disk space that can be swapped is called a *swap*. Through swapping, you can use a memory resource amount that is larger than the amount of memory installed in the physical server.

Since disk access speed is slower than physical memory, using a swap adversely affects the performance of the virtual machine. Therefore, we recommend that when you monitor memory resources, you also check the swapping status.

The following two records are used to monitor memory resources. For details about records, see [5. Records](#).

1. `PI_VMI` record

This record is used to monitor each virtual machine's memory usage and the number of external and internal swaps used.

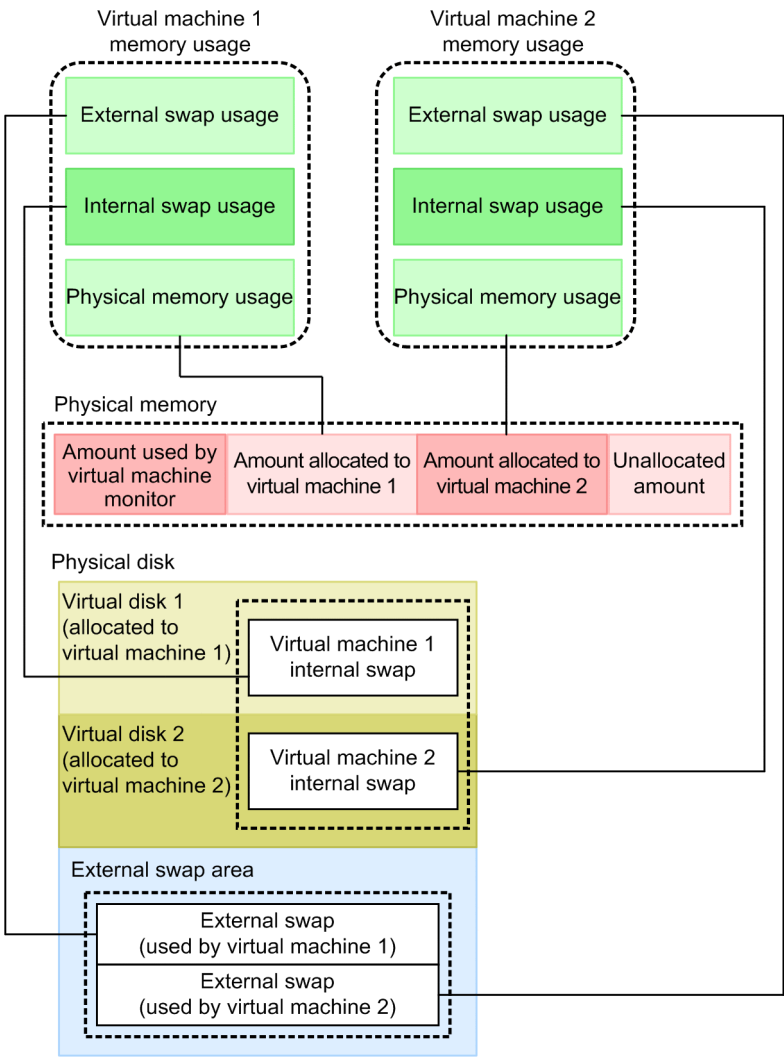
2. `PI_HMI` record

This record is used to monitor the usage of physical memory by the virtual machine monitor and by each virtual machine, and the status of internal and external swaps used by the entire physical server.



The following figure shows the range of performance data collected in each record.



Figure 1–14: Correspondence between records and data collection ranges



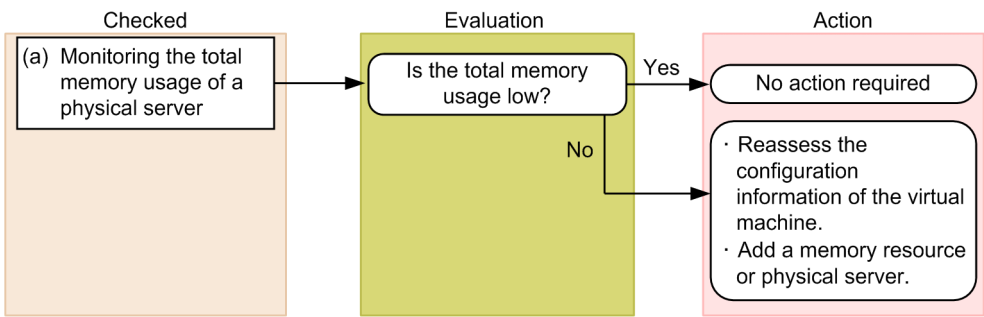
Legend:

-  : Area that can be monitored using the `PI_VMI` record
-  : Area that can be monitored using the `PI_HMI` record

## (2) Monitoring examples

Using monitoring of a physical server on which the virtual environment is running as an example, this subsection explains the factors that cause insufficient memory resources and how to solve these problems. The following figure shows the items monitored here and the flow of actions to take.

Figure 1–15: Monitored items and flow of actions

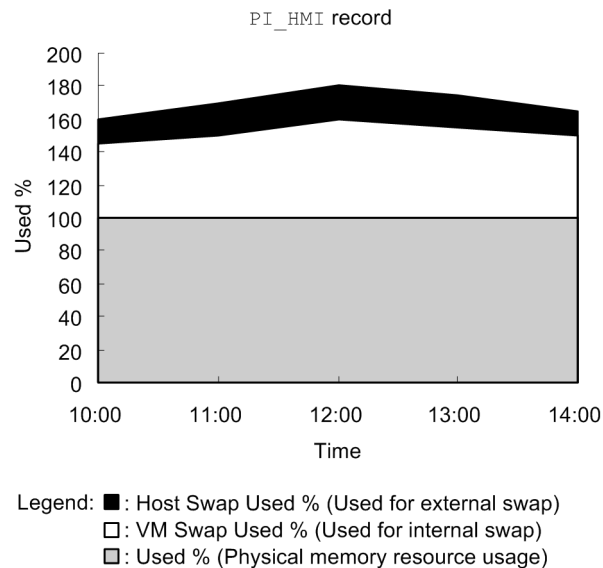


## (a) Example of monitoring the total memory usage of a physical server

You can monitor the total memory usage of a physical server in the Total Used % field of the PI\_HMI record. The total memory usage indicates the usage of all memory resources (physical memory resources, internally swapped resources, and externally swapped resources) provided on the physical server. If this value is large, the memory resources of the physical server are considered insufficient.

The figure below shows an example of monitoring the total memory usage of a physical server.

Figure 1–16: Example of monitoring the total memory usage



*Monitoring template report to be checked*

*Host Memory Used*

*Monitoring template alarm to be checked*

*Host Memory Usage*

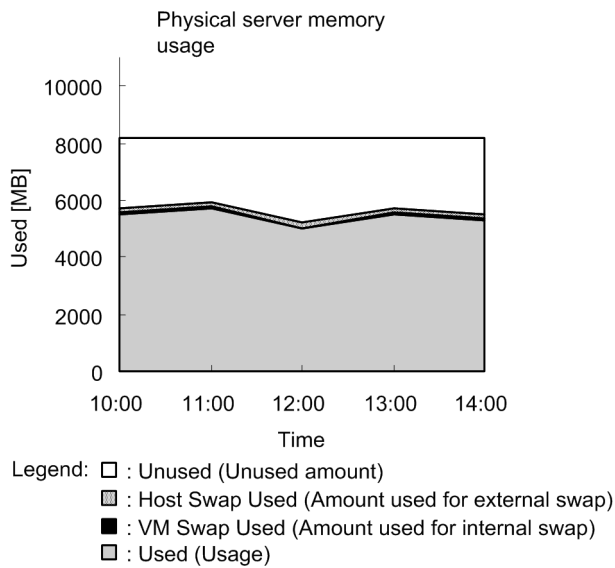
In this example, the value of Total Used %, which indicates the combined total of Used %, VM Swap Used %, and Host Swap Used %, exceeds 100%. Therefore, the memory resources of the physical server are considered insufficient.

In this case, reassess the configuration information of the virtual machine. If the total memory usage value does not improve even after the configuration information has been reassessed, consider either adding memory resources to the physical server or adding a physical server.

### (3) Other monitoring examples

#### (a) Report for evaluating the memory usage of a physical server

Figure 1–17: Example of monitoring the memory usage of a physical server

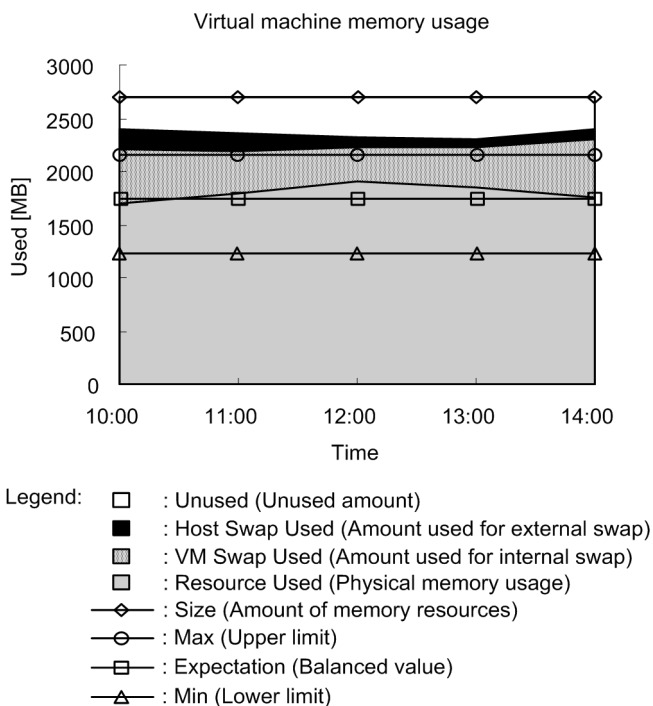


*Monitoring template report to be checked*

*Host Memory Used Status*

#### (b) Report for evaluating the memory usage of a virtual machine

Figure 1–18: Example of monitoring the memory usage of a virtual machine



*Compound report to be checked (see 1.7)*

Monitoring of the upper limit of memory allocation in a virtual machine

## 1.4.5 Monitoring disk resources

This subsection explains how to monitor the disk resources of a VMware system.

### (1) Overview

In a VMware system, multiple virtual machines share the physical server's physical disk. The physical disk space is logically partitioned into logical disks, which are then allocated to individual virtual machines. The OS running on a virtual machine recognizes an allocated logical disk as a normal physical disk.

The following two types of disk resources are available:

- Disk I/O resource  
This is a resource related to disk access statuses.
- Disk space resource  
This is a resource related to disk space.

Since the physical disk is shared in a virtual environment, it is accessed by the individual virtual machines simultaneously. If multiple disk commands are issued simultaneously, the disk I/O resource is distributed according to share ratios that have been set up by the virtual environment software.

Disk commands from a virtual machine for which a large share ratio is set are executed at higher priority. Consequently, disk commands from a virtual machine with a small share ratio may be discarded without being executed. Discarded disk commands are re-executed after a time.

If the rate at which commands are discarded becomes high, disk access is delayed, adversely affecting the performance of the virtual machine. By monitoring the performance data of the disk I/O resource, you can detect such performance deterioration of the virtual machine, and you can thus take the necessary corrective action.

Furthermore, you can check whether there is a logical disk space insufficiency by monitoring the performance data of the disk space resource.

The four records described below are used to monitor the disk resource. For details about records, see [5. Records](#).

1. **PI\_HPDI** record

This record is used to monitor the performance data of the physical disk. It shows the disk I/O resource as viewed from the physical server.

2. **PI\_VPDI** record

This record is used to monitor the performance data of the physical disk being used by the virtual machine. It shows the disk I/O resource as viewed from the virtual machine.

3. **PI\_HLDI** record

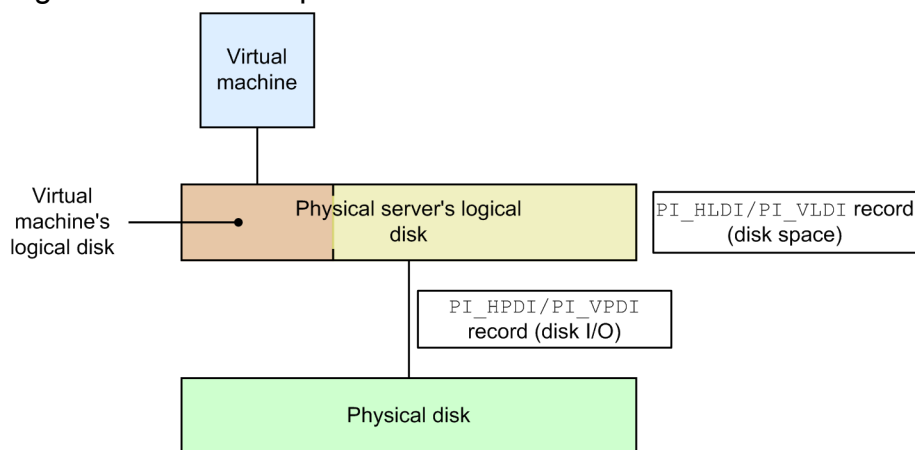
This record is used to monitor the performance data of the physical server's logical disk. It shows the disk space resource as viewed from the physical server.

4. **PI\_VLDI** record

This record is used to monitor the performance data of the virtual machine's logical disk. It shows the disk space resource as viewed from the virtual machine.

The figure below shows the range of performance data collected in each record.

Figure 1–19: Correspondence between records and data collection ranges



## Important note

This note pertains to the source data for the record that JP1/PFM - RM for VM uses to monitor the VMware data store (*Used*, *Free*, and *Used %* fields of the *PI\_HLDD* record). The source data is equivalent to the amount of free space displayed for the storage on the **Configuration** page when the connection-destination VMware ESX is displayed in vSphere Client.<sup>#</sup>

#

This value might be different from the amount of free space displayed in vSphere Client that is connected to vCenter Server. If vSphere Client is connected to vCenter Server, recheck the value by connecting to VMware ESX.

This value is updated every 30 minutes if both of the following conditions are satisfied:

- ESX (or ESXi) is managed with vCenter.
- Virtual machines using VMFS volumes (inactive volumes) are running.

If both of the above conditions are not satisfied, the amount of free space is not updated. The values of the *Used*, *Free*, and *Used %* fields of the *PI\_HLDD* record acquired by JP1/PFM - RM for VM are not updated, either.

To collect or monitor the data of the *Used*, *Free*, and *Used %* fields of the *PI\_HLDD* record, make sure that the system configuration satisfies the above two conditions. In addition, connect vSphere Client to monitoring-target VMware ESX, and then confirm that the last update time displayed for the storage on the **Configuration** page is updated every 30 minutes. If this time is not updated even if the system configuration satisfies the above two conditions, contact the VMware support center.

Note that, even if the above conditions are satisfied, the amount of free space might not be updated due to a KB2008367 problem with VMware (see below).

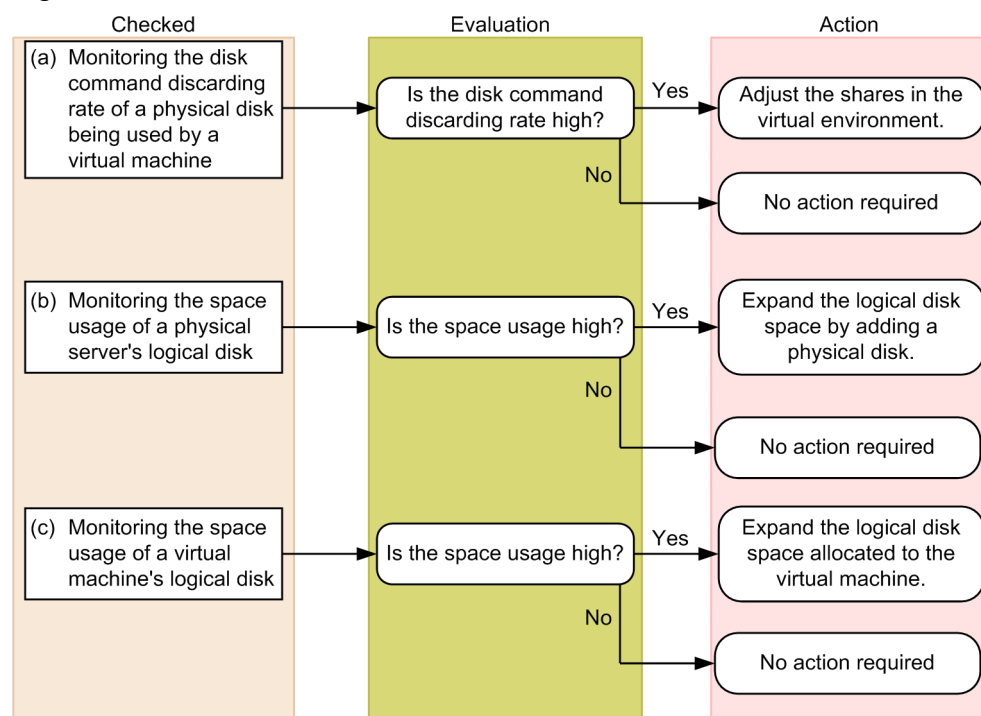
For further information about countermeasures or other topics, contact VMware.

KB2008367: Amount of free space reported on the host is incorrect in vCenter Server

## (2) Monitoring examples

Using monitoring of disk resources for `vhost1` and `vhost2` running on a physical server called `host1` as an example, this subsection explains the problems that might occur in the disk resources and how to solve them. The following figure shows the items monitored here, and the flow of actions to take.

Figure 1–20: Monitored items and flow of actions

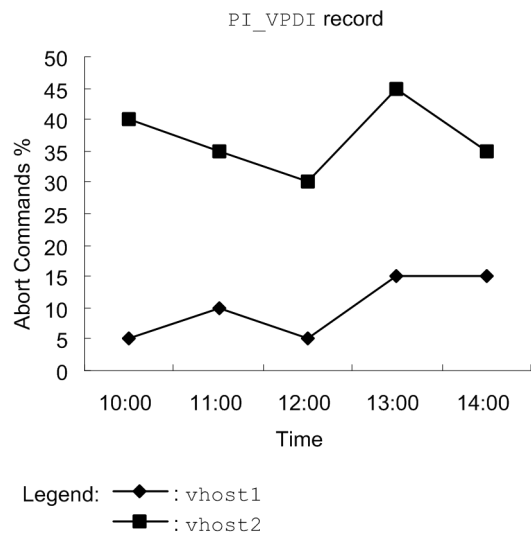


### (a) Example of monitoring the disk command discarding rate of a physical disk being used by a virtual machine

You can monitor the disk command discarding rate of a physical disk being used by a virtual machine in the `Abort Commands %` field of the `PI_VPDI` record. Note that you can monitor this item with an alarm provided in a monitoring template.

The following figure shows an example of monitoring the disk command discarding rate of a physical disk.

Figure 1–21: Example of monitoring the disk command discarding rate



Monitoring template report to be checked

VM Disk Abort Commands

Monitoring template alarm to be checked

VM Disk Abort Cmds

If there is a virtual machine with a high disk command discarding rate, adjust its share of the physical disk. In this example, the disk command discarding rate for the physical disk being used by vhost2 is high, and increasing vhost2's share can solve this problem. For details about how to adjust the share, see the documentation for the virtual environment software.

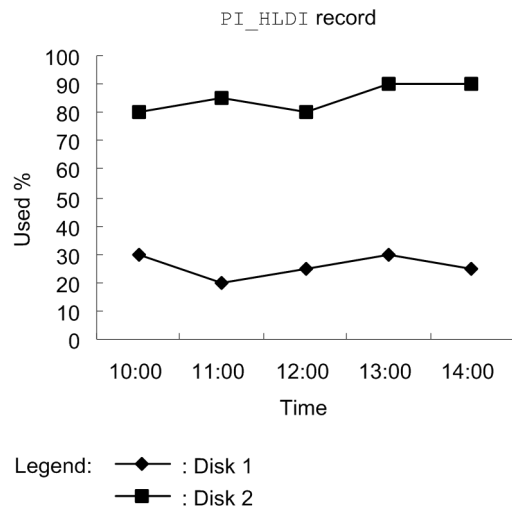
(b) Example of monitoring the space usage of a physical server's logical disk

You can check whether a physical server's logical disk has sufficient free space based on the space usage. Note that you can monitor this item with an alarm provided in a monitoring template.

You can check the space usage in the Used % field of the PI\_HLDI record.

The following figure shows an example of monitoring the space usage of a physical server's logical disk.

Figure 1–22: Example of monitoring the space usage of a physical server's logical disk



*Monitoring template report to be checked*

*Host Disk Used*

*Monitoring template alarm to be checked*

*Host Disk Usage*

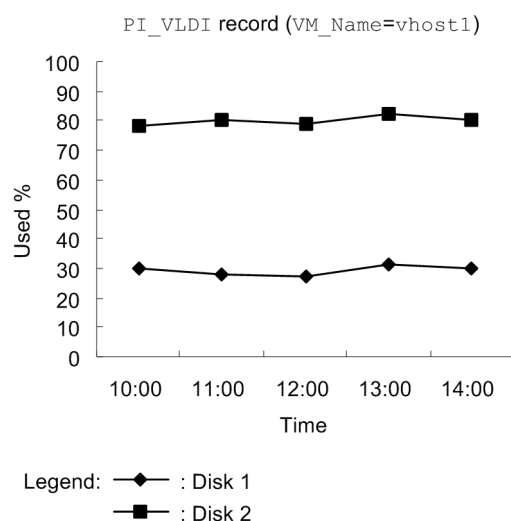
In this example, the space usage of Disk 2 is high. If the space usage is high, you can solve this problem by expanding the logical disk space through the addition of a physical disk. For details about how to expand the disk space, see the documentation for the virtual environment software.

### (c) Example of monitoring the space usage of a virtual machine's logical disk

You can check whether a virtual machine's logical disk has sufficient free space based on the space usage. You can check the space usage in the Used % field of the `PI_VLDI` record. Note that you can monitor this item with an alarm provided in a monitoring template.

The following figure shows an example of monitoring the space usage of a virtual machine's logical disk.

Figure 1–23: Example of monitoring the space usage of a virtual machine's logical disk



*Monitoring template report to be checked*

*VM Disk Used*

*Monitoring template alarm to be checked*

*VM Disk Usage*

In this example, the space usage of Disk 2 being utilized by `vhost1` is high. If the space usage is high, you can solve this problem by expanding the logical disk space allocated to the virtual machine. For details about how to expand the disk space, see the documentation for the virtual environment software.

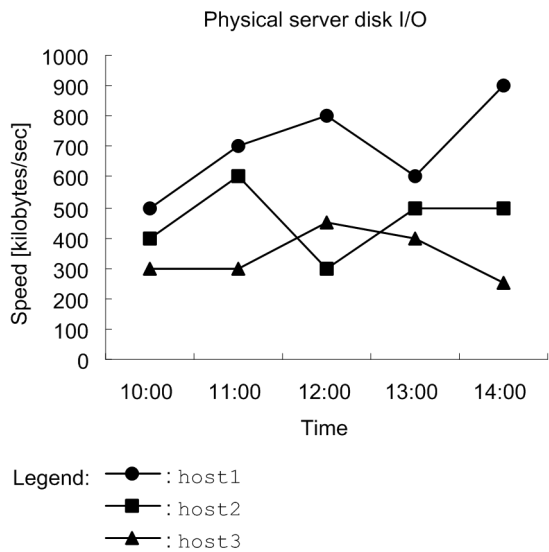
## (3) Other monitoring examples

Monitoring examples follow that use monitoring templates other than those explained in (2) *Monitoring examples*.



(a) Report that displays the disk I/O state of a physical server

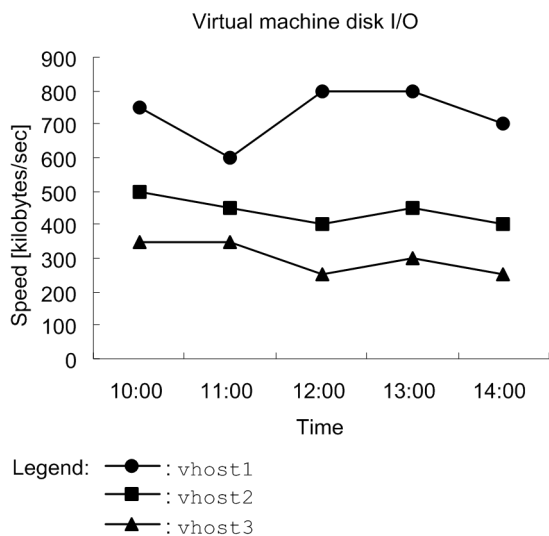
Figure 1–24: Example of monitoring a physical server's disk I/O state



Monitoring template report to be checked  
*Host Disk I/O*

(b) Report that displays the disk I/O state of a virtual machine

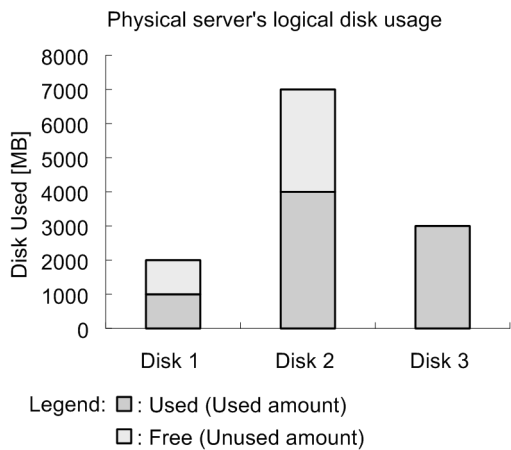
Figure 1–25: Example of monitoring a virtual machine's disk I/O state



Monitoring template report to be checked  
*VM Disk I/O*

(c) Report that displays the usage status of a physical server's logical disk

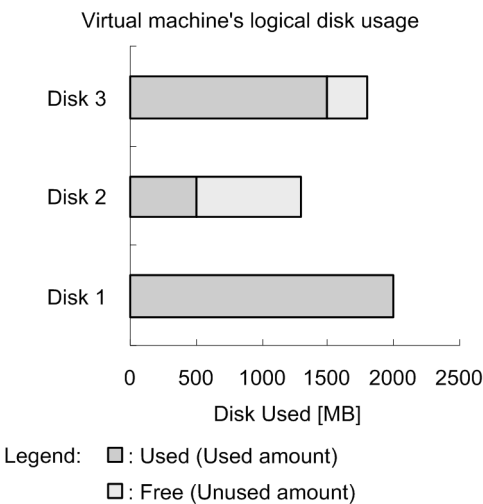
Figure 1–26: Example of monitoring the usage status of a physical server's logical disk



Monitoring template report to be checked  
*Host Disk Used Status*

(d) Report that displays the usage status of a virtual machine's logical disk

Figure 1–27: Example of monitoring the usage status of a virtual machine's logical disk



Monitoring template report to be checked  
*VM Disk Used Status*

1.4.6 Monitoring the network resources

This subsection explains how to monitor the network resources of a VMware system.

(1) Overview

In a VMware system, multiple virtual machines share the NIC of the physical server. The NIC allocated to each virtual machine is called the *virtual NIC*. The OS running on a virtual machine recognizes a virtual NIC as a normal NIC.

In a virtual environment, virtual machines use the physical NIC at the same time, and as a result, the network bandwidth that can be used by each virtual machine becomes narrow. Consequently, each virtual machine's network data send/receive speed may decrease.

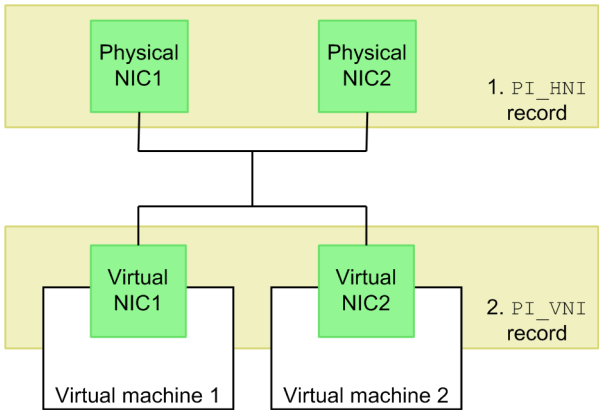
By monitoring the network's performance data, you can detect such performance deterioration of the virtual machine, and thus you can take the necessary corrective action.

The two records described below are used for monitoring the network resources. For details about the records, see [5. Records](#).

- 1. PI\_HNI record  
This record is used to monitor the performance data of the physical NIC.
- 2. PI\_VNI record  
This record is used to monitor the performance data of the virtual NIC.

The figure below shows the range of performance data collected in each record.

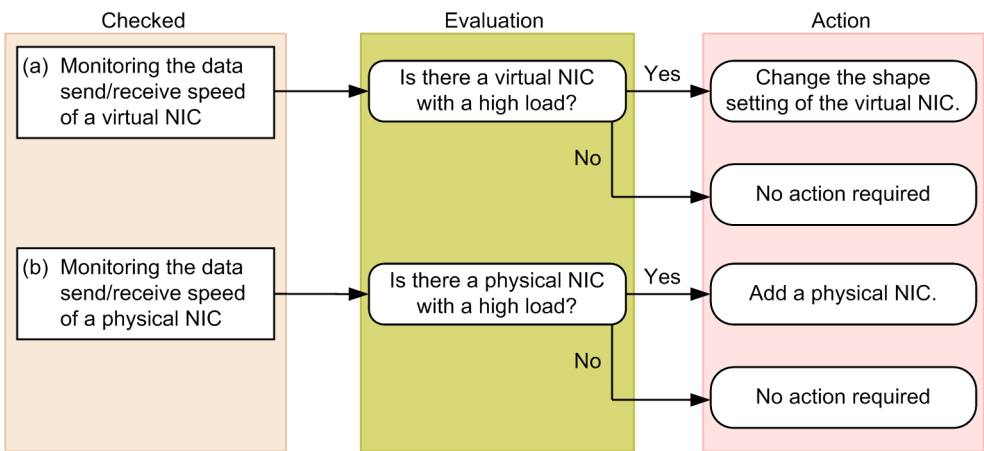
Figure 1–28: Correspondence between records and data collection ranges



## (2) Monitoring examples

Using resource monitoring of virtual NIC1 and NIC2 and physical NIC1 and NIC2 as an example, this subsection explains problems that may occur with network resources, and how to solve them. The figure below shows the items monitored here and the flow of actions to take.

Figure 1–29: Monitored items and flow of actions

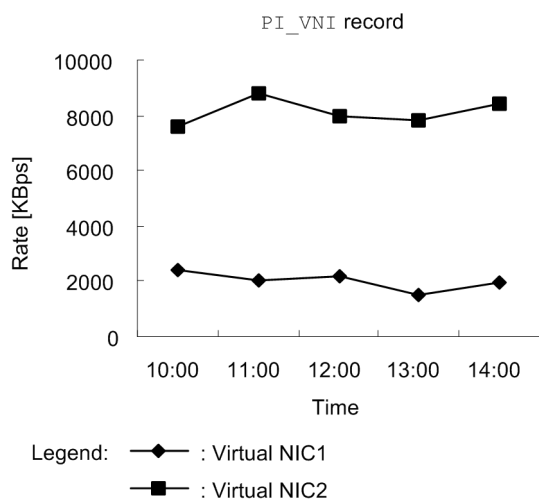


## (a) Example of monitoring the data send/receive speed of a virtual NIC

You can monitor the load applied to a virtual NIC based on the data send/receive speed of the virtual NIC. You can check the data send/receive speed of the virtual NIC in the Rate field of the `PI_VNI` record.

The figure below shows an example of monitoring the data send/receive speed of a virtual NIC.

Figure 1–30: Example of monitoring the data send/receive speed of a virtual NIC



*Monitoring template report to be checked*

### *VM Network Data*

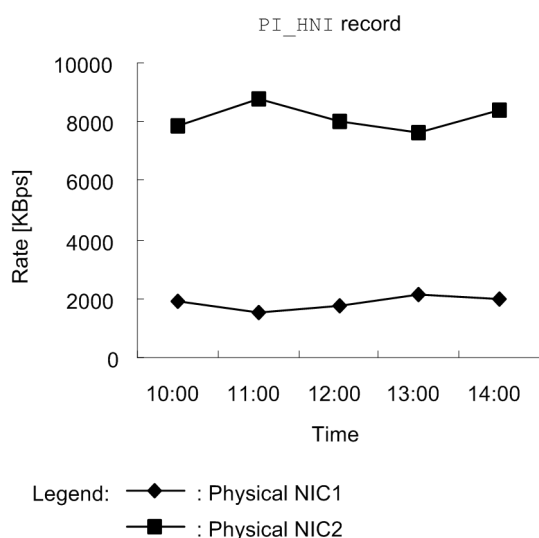
In this example, the data send/receive speed of virtual NIC2 is high, indicating a high load level. If there is a virtual NIC with a high load, you can solve this problem by changing the shape settings of a lower-priority virtual NIC. For details about how to change the shape settings, see the documentation for the virtual environment software.

## (b) Example of monitoring the data send/receive speed of a physical NIC

You can monitor the load applied to a physical NIC based on the data send/receive speed of the physical NIC. You can check the data send/receive speed of the physical NIC in the Rate field of the `PI_HNI` record.

The figure below shows an example of monitoring the data send/receive speed of a physical NIC.

Figure 1–31: Example of monitoring the data send/receive speed of a physical NIC



*Monitoring template report to be checked*

*Host Network Data*

In this example, the data send/receive speed of physical NIC2 is high, indicating a high load level. If there is a physical NIC with a high load, consider adding a physical NIC.

## 1.5 Example of performance monitoring operation using PFM - RM for Virtual Machine (for Hyper-V)

---

To ensure the stability of operations in a system, it is important to monitor the system's performance and assess its status. This section explains how to use PFM - RM for Virtual Machine to monitor the performance of a Hyper-V system.

### 1.5.1 System resources that are important for performance monitoring in a Hyper-V system

The following are the system resources that are important when you use PFM - RM for Virtual Machine to monitor the performance of a Hyper-V system.

- CPU resource (see [1.5.3](#))  
This is the CPU resource installed on the physical server. It is important for performance monitoring of CPU usage and other items.
- Memory resource (see [1.5.4](#))  
This is the memory resource installed on the physical server. It is important for performance monitoring of memory usage and other items.
- Disk resource (see [1.5.5](#))  
This is the disk resource installed on the physical server. It is important for performance monitoring of disk usage, disk I/O status, and other items.
- Network resource (see [1.5.6](#))  
This is the NIC resource installed on the physical server. It is important for performance monitoring of data send/receive speed and other items.

To set up definitions to monitor these important items, PFM - RM for Virtual Machine provides monitoring templates. Therefore, this section mainly explains monitoring methods that use monitoring templates.

### 1.5.2 Selecting a baseline

See [1.4.2 Selecting a baseline](#).

### 1.5.3 Monitoring the CPU resource

This subsection explains how to monitor the CPU resource of a Hyper-V system.

#### (1) Overview

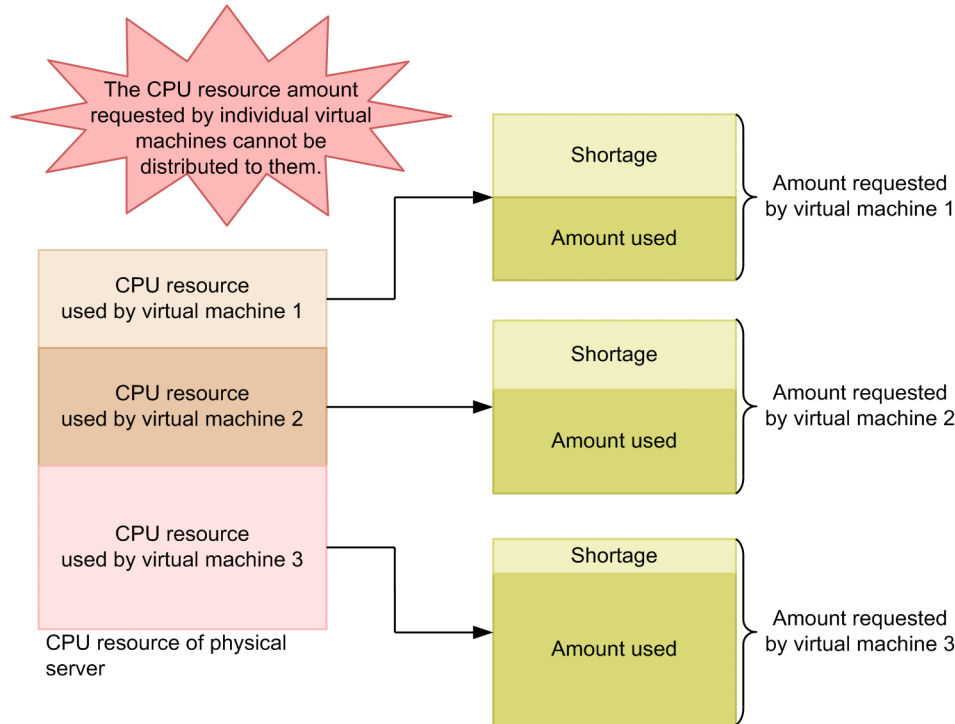
In a Hyper-V system, multiple virtual machines share the physical server's CPU. The CPU resource allocated to each virtual machine is called a *virtual CPU*. The OS running on a virtual machine recognizes a virtual CPU as a normal physical CPU.

The CPU resource of the physical server is distributed according to each virtual machine's CPU resource requirement. However, if the combined total of the CPU resource requirements for the individual virtual machines exceeds the CPU

resource on the physical server, the required amount of CPU resource cannot be distributed, resulting in a virtual CPU resource shortage. This adversely affects the performance of the virtual machine.

The schematic diagram below shows a state in which a virtual CPU resource shortage has occurred.

Figure 1–32: Schematic diagram of a virtual CPU resource shortage



By monitoring CPU performance data, you can detect such performance deterioration in the virtual machines, and thus you can take appropriate corrective action.

Furthermore, in a virtual environment all physical devices are virtualized, such as memory, disks, and network interfaces. The CPU performs this virtualization of physical devices. Therefore, the CPU resource is an important resource that also affects the performance of other virtual devices.

The following four records are used to monitor the CPU resource. For details about records, see [5. Records](#).

1. `PI` record

This record is used to monitor the performance data of the physical server's CPU.

2. `PI_HCI` record

This record is used to monitor the performance data of each core of the physical CPU.

3. `PI_VI` record

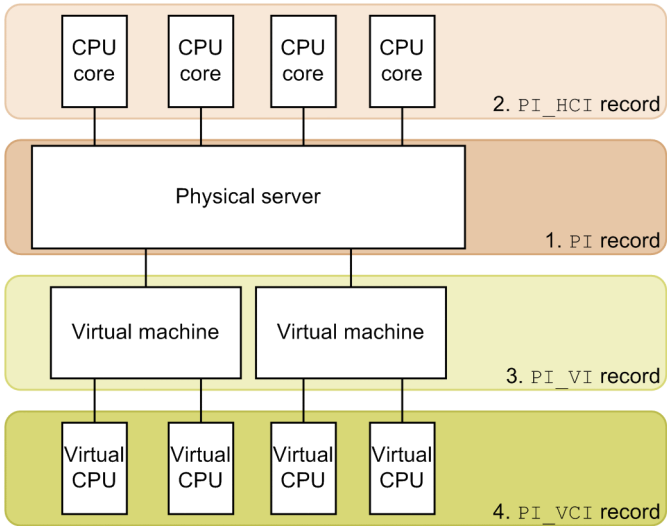
This record is used to monitor the performance data of the CPU that is being used by each virtual machine.

4. `PI_VCI` record

This record is used to monitor the performance data of each virtual CPU.

The following figure shows the range of performance data collected in each record.

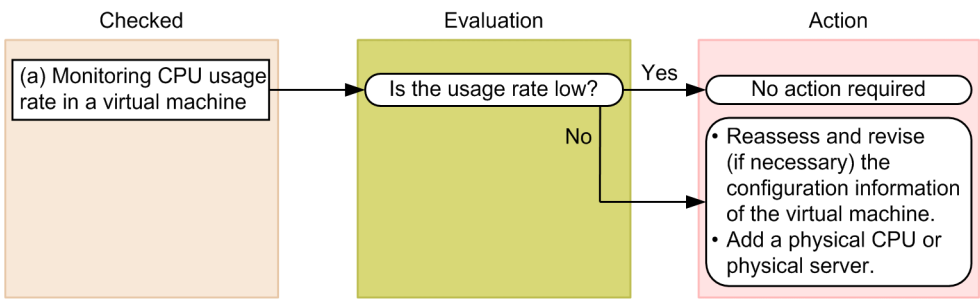
Figure 1–33: Range of performance data collected in each record



(2) Monitoring examples

Using CPU resource monitoring on virtual machines `vhost1` through `vhost3` as an example, this subsection explains the factors that cause insufficient CPU resources, and how to solve this problem. The following figure shows the items monitored here and the flow of actions to take.

Figure 1–34: Monitored items and flow of actions



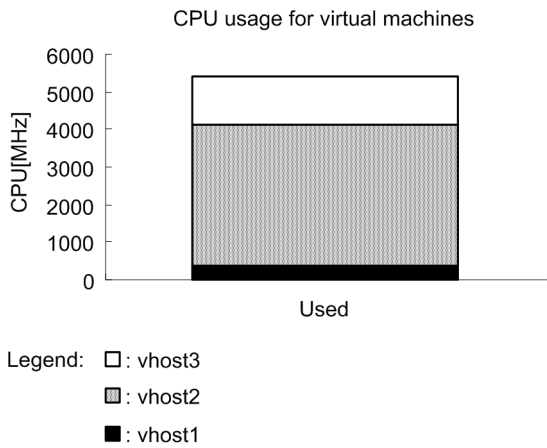
(a) Example of monitoring the CPU usage rate for virtual machines

You can check the CPU usage rate for virtual machines in the Used % field of the `PI_VI` record.

An example of monitoring is shown below. This example is based on using the monitoring template to display a VM CPU Used Status report. The chart in this report displays the Used field that indicates the CPU usage for the virtual machines. To monitor the Used % field, check the table that is displayed under the chart.



Figure 1–35: Example of monitoring the CPU usage for virtual machines



Monitoring template report to be checked  
*VM CPU Used Status*

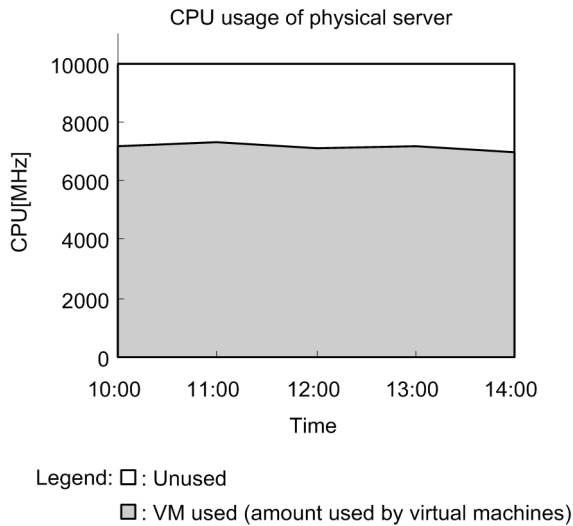
In this example, the CPU usage rate of `vhost2` has increased. If the CPU usage rate is high and the virtual machine's performance is poor, you should revise configuration information for the virtual machines, such as by resetting the maximum CPU allocation size. If the problem persists, consider either adding a physical CPU or adding a physical server.

(3) Other monitoring examples

Monitoring examples follow that use monitoring templates other than those explained in (2) *Monitoring examples*.

(a) Monitoring the physical server's CPU usage status

Figure 1–36: Example of monitoring a physical server's CPU usage status



Monitoring template report to be checked  
*Host CPU Used Status*

In this report, a drill-down feature is provided on the reports stored in the `Troubleshooting/Recent Past` folder. Clicking a virtual machine's usage plane on the graph displays the VM CPU Used Status report shown in Figure 1-35.

# 1.5.4 Monitoring the memory resource

This subsection explains how to monitor the memory resource of a Hyper-V system.

## (1) Overview

In a Hyper-V system, the physical server's memory resource is allocated to multiple virtual machines. The OS running on a virtual machine recognizes its allocated memory resource as a normal physical memory.

If the combined total of the memory resources required by all the virtual machines exceeds the memory resources on the physical server, performance of the virtual machines will be affected adversely. Monitoring memory performance enables you to detect such performance deteriorations in the virtual machines.

The following two records are used to monitor memory resources. For details about records, see [5. Records](#).

1. `PI_HMI` record

This record is used to monitor the usage of physical memory by the virtual machine monitor and by each virtual machine, and the status of internal and external swaps used by the entire physical server.

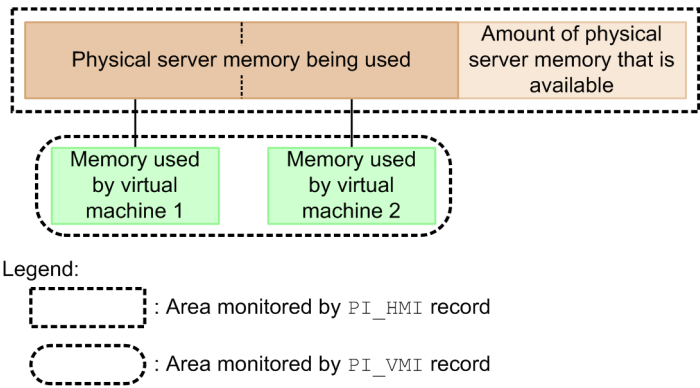
2. `PI_VMI` record

This record is used to monitor the amount of memory resources allocated to each virtual machine.

The amount of the physical server's memory resources available to each virtual machine is determined when each virtual machine is created. Therefore, in a Hyper-V system, the memory required for operations cannot exceed the size of the real memory that is installed on the physical server. Normally, there is no need to monitor the `PI_VMI` record because the memory allocation does not change during system operation.

The following figure shows the range of performance data collected in the `PI_HMI` and `PI_VMI` records.

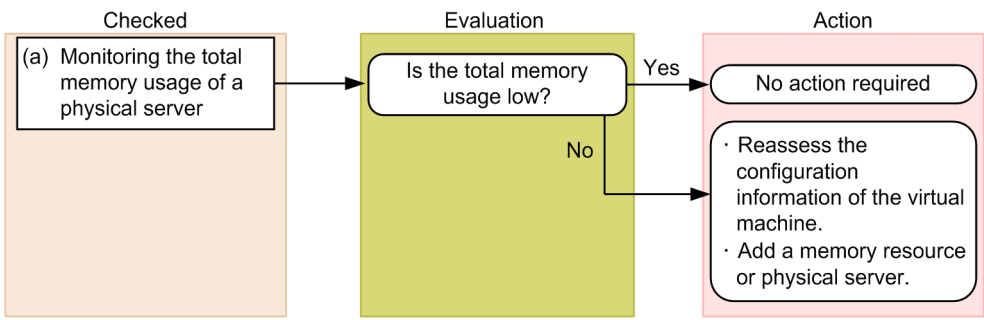
Figure 1–37: Correspondence between records and data collection ranges



## (2) Monitoring examples

This subsection uses an example of monitoring a physical server on which a virtual environment is running to explain the factors that cause insufficient memory resources and how to solve such problems. The following figure shows the items monitored here and the flow of actions to take.

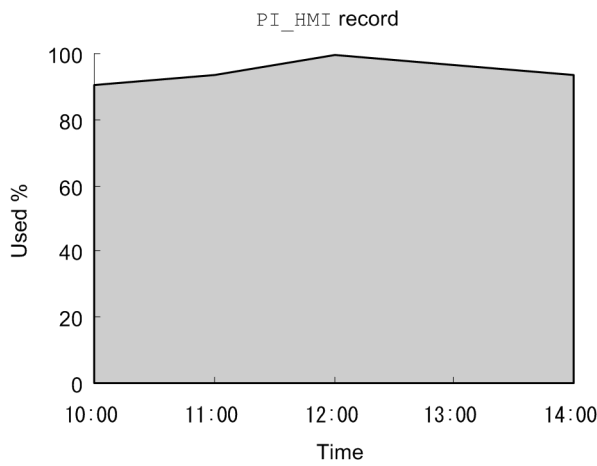
Figure 1–38: Monitored items and flow of actions



**(a) Example of monitoring the total memory usage of a physical server**

You can monitor the total memory usage of a physical server in the Total Used % field of the `PI_HMI` record. If this value is large, the memory resources of the physical server are considered insufficient. Note that you can monitor this item by using an alarm that is provided in the monitoring template. The figure below shows a monitoring example.

Figure 1–39: Example of monitoring the total memory usage



Legend:  : Used % (Physical memory resource usage)

*Monitoring template report to be checked*

*Host Memory Used*

*Monitoring template alarm to be checked*

*Host Memory Usage*

In this example, the memory resources of the physical server are considered insufficient because the value remains large over the entire period. In such a case, revise the configuration information for the virtual machines. If the total memory usage value does not improve even after the configuration information has been revised, consider either adding memory resources to the physical server or adding a physical server.

**1.5.5 Monitoring disk resources**

This subsection explains how to monitor the disk resources of a Hyper-V system.

## (1) Overview

In a Hyper-V system, one of the following methods is used to provide disk resources to a virtual machine:

- Allocation to a virtual machine of a virtual hard disk file created on the physical disk
- Allocation of a physical disk to a virtual machine

The OS running on a virtual machine recognizes the allocated disk resources as a normal physical disk.

Information on disk resources can be classified as the disk I/O resource (which includes information such as the disk transfer rate) and the disk space resource (which includes information such as the disk capacity). PFM - RM for Virtual Machine provides records for these two types of disk resources. When you monitor a Hyper-V system, you can use the records listed below to monitor the disk resources. Note that the `PI_VLDI` record that indicates a virtual machine's disk space resource is not supported.

### 1. `PI_HPDI` record

This record is used to monitor the performance data of the physical disk. It shows the disk I/O resource as viewed from the physical server.

### 2. `PI_VPDI` record

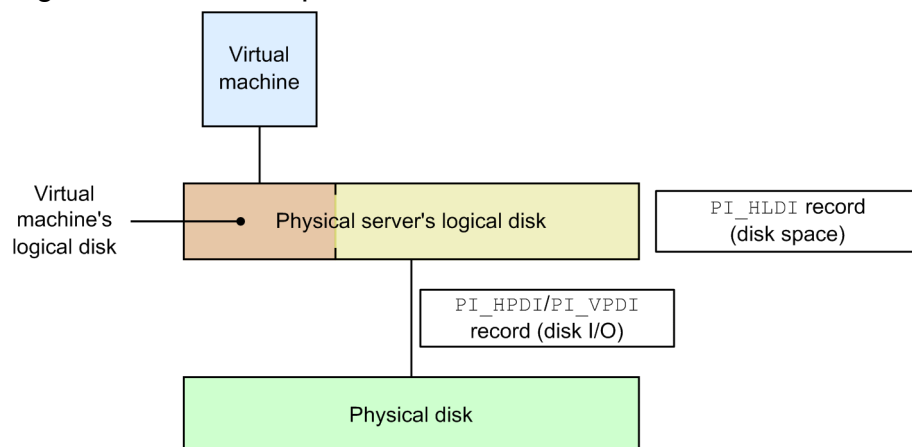
This record is used to monitor the performance data of the physical disk being used by a virtual machine. It shows the disk I/O resource as viewed from the virtual machine.

### 3. `PI_HLDI` record

This record is used to monitor the performance data of the physical server's logical disk. It shows the disk space resource as viewed from the physical server.

The following figure shows the range of performance data collected in each record.

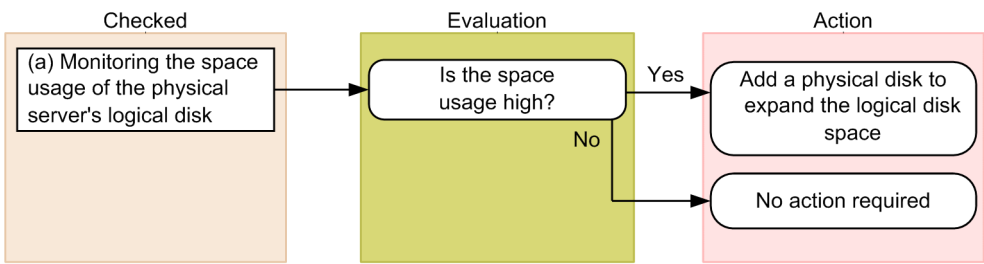
Figure 1–40: Correspondence between records and data collection ranges



## (2) Monitoring examples

This subsection uses an example of monitoring `disk 1` and `disk 2` installed on the physical server to explain the problems that might occur in disk resources and how to solve them. The following figure shows the items monitored here and the flow of actions to take.

Figure 1–41: Monitored items and flow of actions

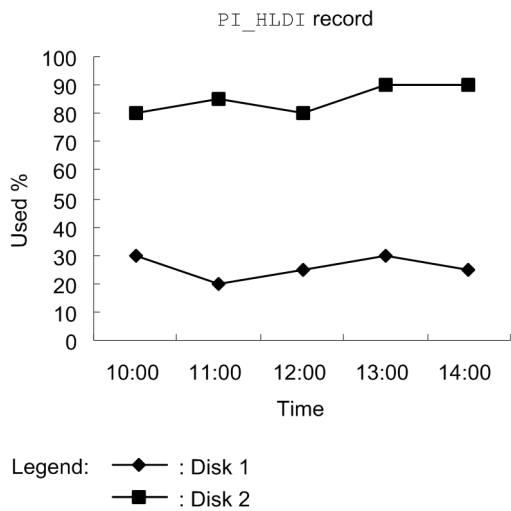


**(a) Example of monitoring the space usage of a physical server's logical disk**

You can check whether a physical server's logical disk has sufficient free space based on the space usage.

You can check the space usage in the Used % field of the `PI_HLDI` record. Note that you can monitor this field using an alarm that is provided in the monitoring template. The figure below shows a monitoring example.

Figure 1–42: Example of monitoring the space usage of a physical server's logical disk



*Monitoring template report to be checked*

*Host Disk Used*

*Monitoring template alarm to be checked*

*Host Disk Usage*

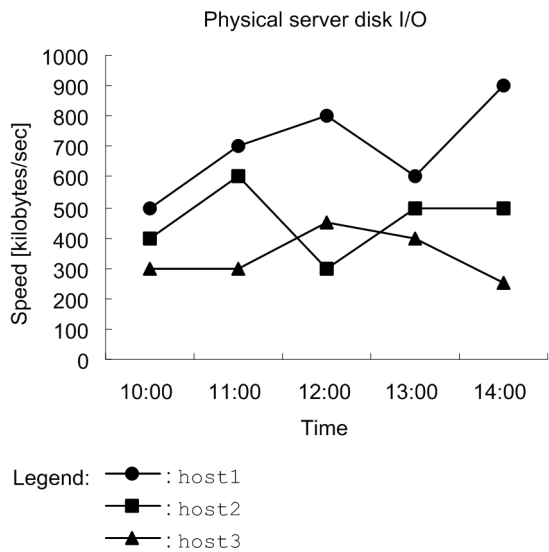
In this example, the space usage of Disk 2 is high. If the space usage is high, you can solve this problem by expanding the logical disk space through the addition of a physical disk or by reducing the logical disk space that is allocated to each virtual machine.

**(3) Other monitoring examples**

Monitoring examples follow that use monitoring templates other than those explained in (2) *Monitoring examples*.

(a) Report that displays the disk I/O state of a physical server

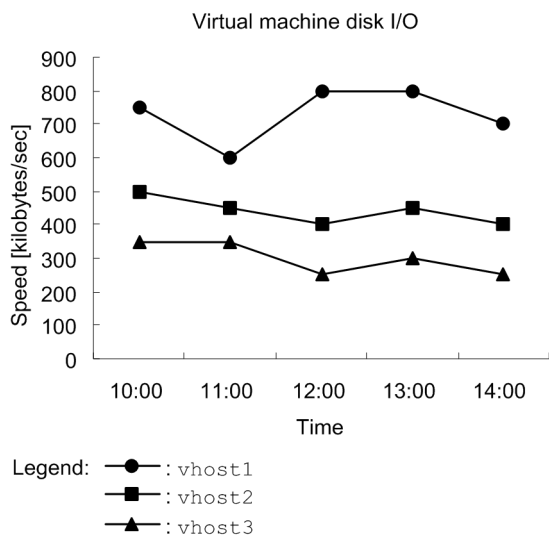
Figure 1–43: Example of monitoring a physical server's disk I/O state



Monitoring template report to be checked  
*Host Disk I/O*

(b) Report that displays the disk I/O state of a virtual machine

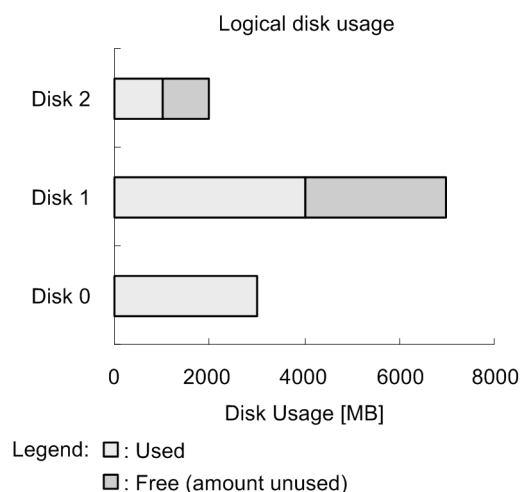
Figure 1–44: Example of monitoring a virtual machine's disk I/O state



Monitoring template report to be checked  
*VM Disk I/O*

## (c) Report that displays the usage status of a virtual machine's logical disk

Figure 1–45: Example of monitoring the usage status of a virtual machine's logical disk



*Monitoring template report to be checked*

*VM Disk Used Status*

## 1.5.6 Monitoring the network resources

This subsection explains how to monitor the network resources of a Hyper-V system.

### (1) Overview

In a Hyper-V system, multiple virtual machines share the NIC of the physical server. The NIC allocated to each virtual machine is called the *virtual NIC*.

The OS running on a virtual machine recognizes a virtual NIC as a normal NIC.

In a virtual environment, multiple virtual machines may use the physical NIC at the same time. As a result, the network bandwidth available to each virtual machine narrows, and each virtual machine's network data send/receive speed may decrease.

By monitoring the network's performance data, you can detect such performance deterioration in the virtual machines, enabling you to take appropriate corrective action.

The two records described below are used for monitoring the network resources. For details about the records, see [5. Records](#).

#### 1. PI\_HNI record

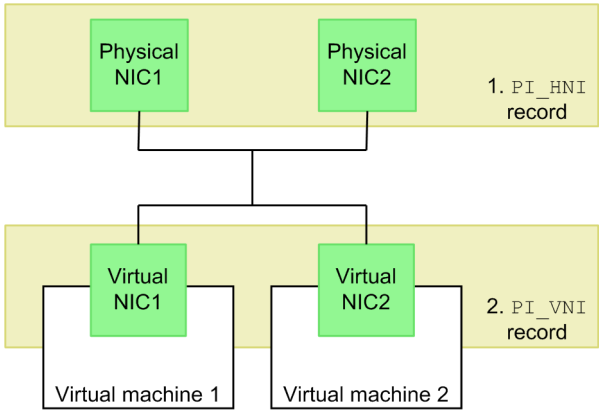
This record is used to monitor the performance data of the physical NIC.

#### 2. PI\_VNI record

This record is used to monitor the performance data of the virtual NIC.

The following figure shows the range of performance data collected in each record.

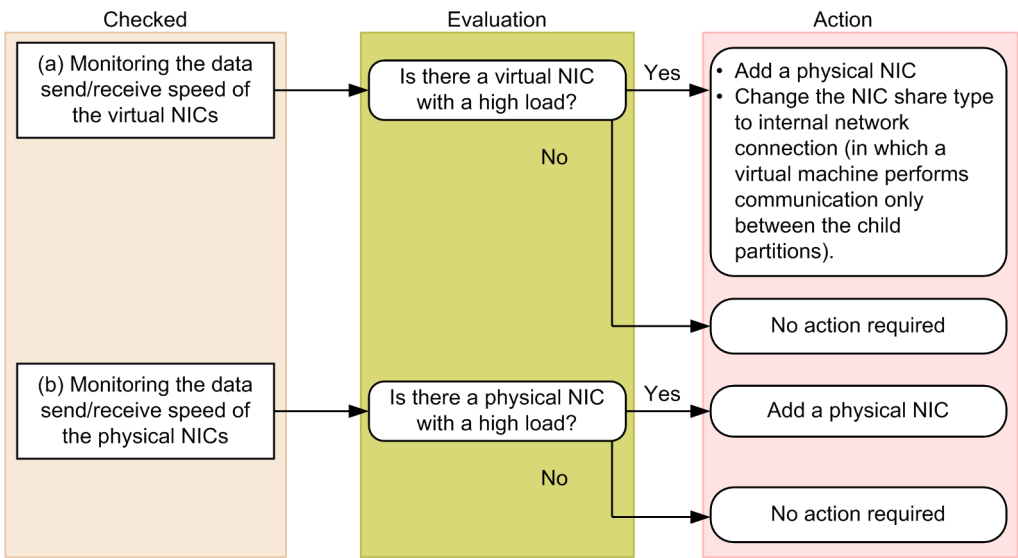
Figure 1–46: Correspondence between records and data collection ranges



(2) Monitoring examples

Using resource monitoring of virtual NIC1 and NIC2 and physical NIC1 and NIC2 as an example, this subsection explains problems that may occur with network resources, and how to solve them. The following figure shows the items monitored here and the flow of actions to take.

Figure 1–47: Monitored items and flow of actions



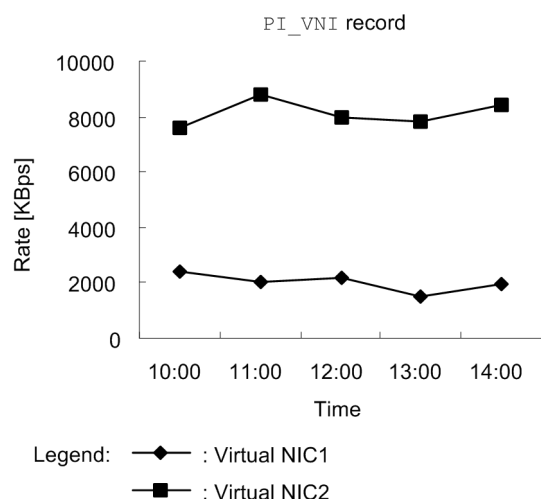
(a) Example of monitoring the data send/receive speed of a virtual NIC

You can monitor the load applied to a virtual NIC based on the data send/receive speed of the virtual NIC. You can check the data send/receive speed of the virtual NIC in the Rate field of the PI\_VNI record.

The figure below shows an example of monitoring the data send/receive speed of a virtual NIC.



Figure 1–48: Example of monitoring the data send/receive speed of a virtual NIC



*Monitoring template report to be checked*

#### *VM Network Data*

In this example, the data send/receive speed of virtual NIC2 is high, indicating a high load level. When there is a virtual NIC with a high load, take the following action according to the virtual machine's communication status:

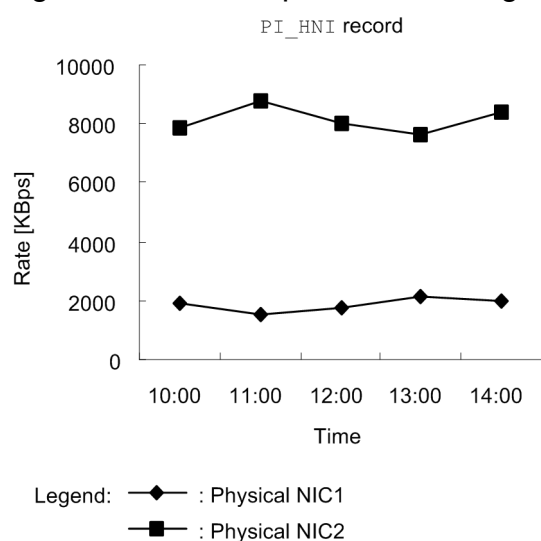
- If the virtual machine communicates with an external network  
Add a physical NIC to distribute the load of the virtual NIC.
- If the virtual machine communicates only with another virtual machine (child partition)  
Change the virtual NIC type to internal network connection.

### **(b) Example of monitoring the data send/receive speed of a physical NIC**

You can monitor the load applied to a physical NIC based on the data send/receive speed of the physical NIC. You can check the data send/receive speed of the physical NIC in the Rate field of the PI\_HNI record.

The figure below shows an example of monitoring the data send/receive speed of a physical NIC.

Figure 1–49: Example of monitoring the data send/receive speed of a physical NIC



*Monitoring template report to be checked*

*Host Network Data*

In this example, the data send/receive speed of physical NIC2 is high, indicating a high load level. If there is a physical NIC with a high load, consider adding a physical NIC.

## 1.6 Example of performance monitoring operation using PFM - RM for Virtual Machine (for KVM)

---

To ensure the stability of operations in a system, it is important to monitor the system's performance and assess its status. This section explains how to use PFM - RM for Virtual Machine to monitor the performance of a KVM system.

### 1.6.1 System resources that are important for performance monitoring in a KVM system

The following are the system resources that are important when you use PFM - RM for Virtual Machine to monitor the performance of a KVM system.

- CPU resource (see [1.6.3](#))  
This is the CPU resource installed on the physical server. It is important for performance monitoring of CPU usage and other items.
- Memory resource (see [1.6.4](#))  
This is the memory resource installed on the physical server. It is important for performance monitoring of memory usage and other items.
- Disk resource (see [1.6.5](#))  
This is the disk resource installed on the physical server. It is important for performance monitoring of disk usage, disk I/O status, and other items.
- Network resource (see [1.6.6](#))  
This is the NIC resource installed on the physical server. It is important for performance monitoring of data send/receive speed and other items.

To set up definitions to monitor these important items, PFM - RM for Virtual Machine provides monitoring templates. Therefore, this section mainly explains monitoring methods that use monitoring templates.

### 1.6.2 Selecting a baseline

See [1.4.2 Selecting a baseline](#).

### 1.6.3 Monitoring the CPU resource

This subsection explains how to monitor the CPU resource of a KVM system.

#### (1) Overview

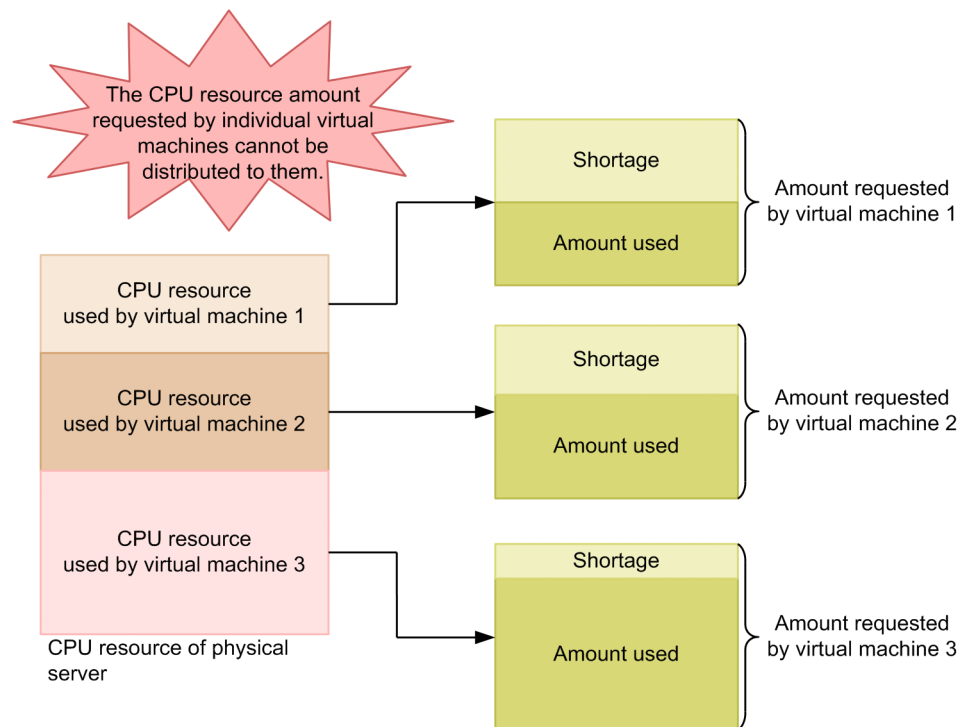
In a KVM system, multiple virtual machines share the physical server's CPU. The CPU resource allocated to each virtual machine is called a *virtual CPU*. The OS running on a virtual machine recognizes a virtual CPU as a normal physical CPU.

The CPU resource of the physical server is distributed according to each virtual machine's CPU resource requirement. However, if the combined total of the CPU resource requirements for the individual virtual machines exceeds the CPU

resource on the physical server, the required amount of CPU resource cannot be distributed, resulting in a virtual CPU resource shortage. This adversely affects the performance of the virtual machine.

The schematic diagram below shows a state in which a virtual CPU resource shortage has occurred.

Figure 1–50: Schematic diagram of a virtual CPU resource shortage



By monitoring CPU performance data, you can detect such performance deterioration in the virtual machines, and thus you can take appropriate corrective action.

Furthermore, in a virtual environment all physical devices are virtualized, such as memory, disks, and network interfaces. The CPU performs this virtualization of physical devices. Therefore, the CPU resource is an important resource that also affects the performance of other virtual devices.

The following four records are used to monitor the CPU resource. For details about records, see [5. Records](#).

1. **PI** record

This record is used to monitor the performance data of the physical server's CPU.

2. **PI\_HCI** record

This record is used to monitor the performance data of each core of the physical CPU.

3. **PI\_VI** record

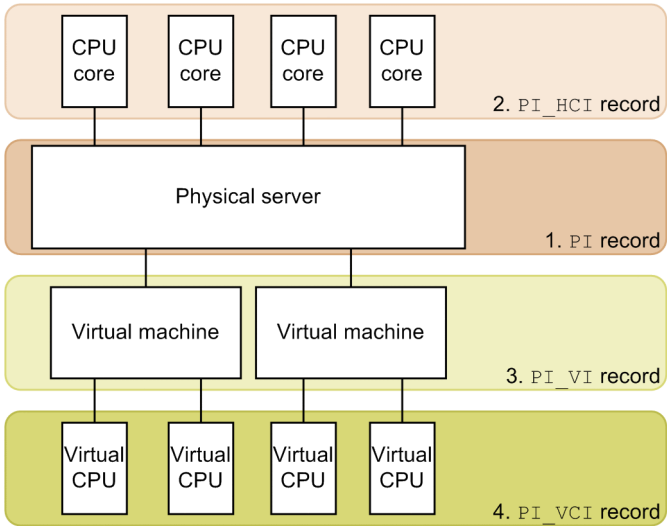
This record is used to monitor the performance data of the CPU that is being used by each virtual machine.

4. **PI\_VCI** record

This record is used to monitor the performance data of each virtual CPU.

The following figure shows the range of performance data collected in each record.

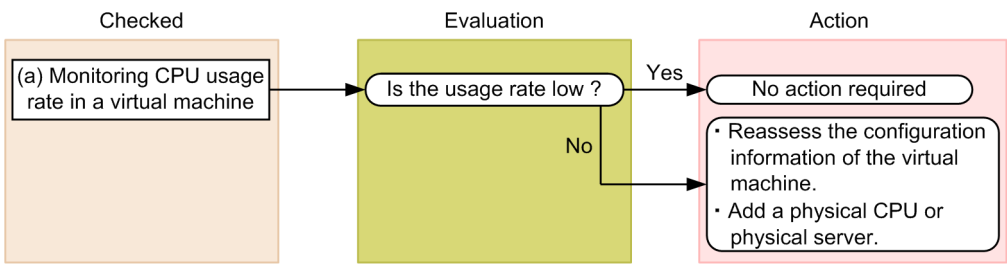
Figure 1–51: Range of performance data collected in each record



(2) Monitoring examples

Using CPU resource monitoring on virtual machines `vhost1` through `vhost3` as an example, this subsection explains the factors that cause insufficient CPU resources, and how to solve this problem. The following figure shows the items monitored here and the flow of actions to take.

Figure 1–52: Monitored items and flow of actions

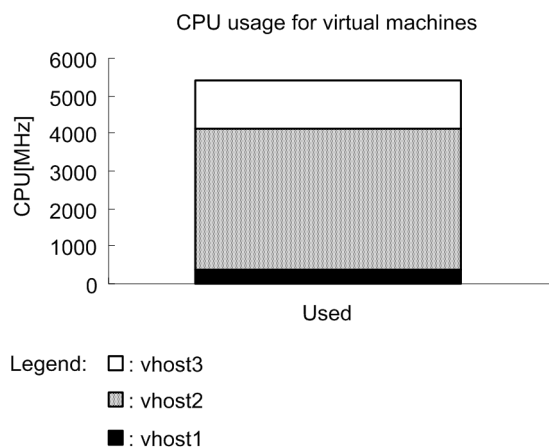


(a) Example of monitoring the CPU usage rate for virtual machines

You can check the CPU usage rate for virtual machines in the Used % field of the `PI_VI` record.

An example of monitoring is shown below. This example is based on using the monitoring template to display a VM CPU Used Status report. The chart in this report displays the Used field that indicates the CPU usage for the virtual machines. To monitor the Used % field, check the table that is displayed under the chart.

Figure 1–53: Example of monitoring the CPU usage for virtual machines



*Monitoring template report to be checked*

#### *VM CPU Used Status*

In this example, the CPU usage of `vhost2` is high. If the performance of a virtual machine has degraded due to high CPU usage, review the number of allocated CPUs and other configuration information of the virtual environment. If the problem still cannot be solved, consider whether you can add physical CPUs or physical servers.

## 1.6.4 Monitoring the memory resource

This subsection explains how to monitor the memory resource of a KVM system.

### (1) Overview

In a KVM system, the physical server's memory resource is allocated to multiple virtual machines. The OS running on a virtual machine recognizes its allocated memory resource as a normal physical memory.

If the combined total of the memory resources required by all the virtual machines exceeds the memory resources on the physical server, performance of the virtual machines will be affected adversely. Monitoring memory performance enables you to detect such performance deteriorations in the virtual machines.

The following two records are used to monitor memory resources. For details about records, see [5. Records](#).

#### 1. `PI_HMI` record

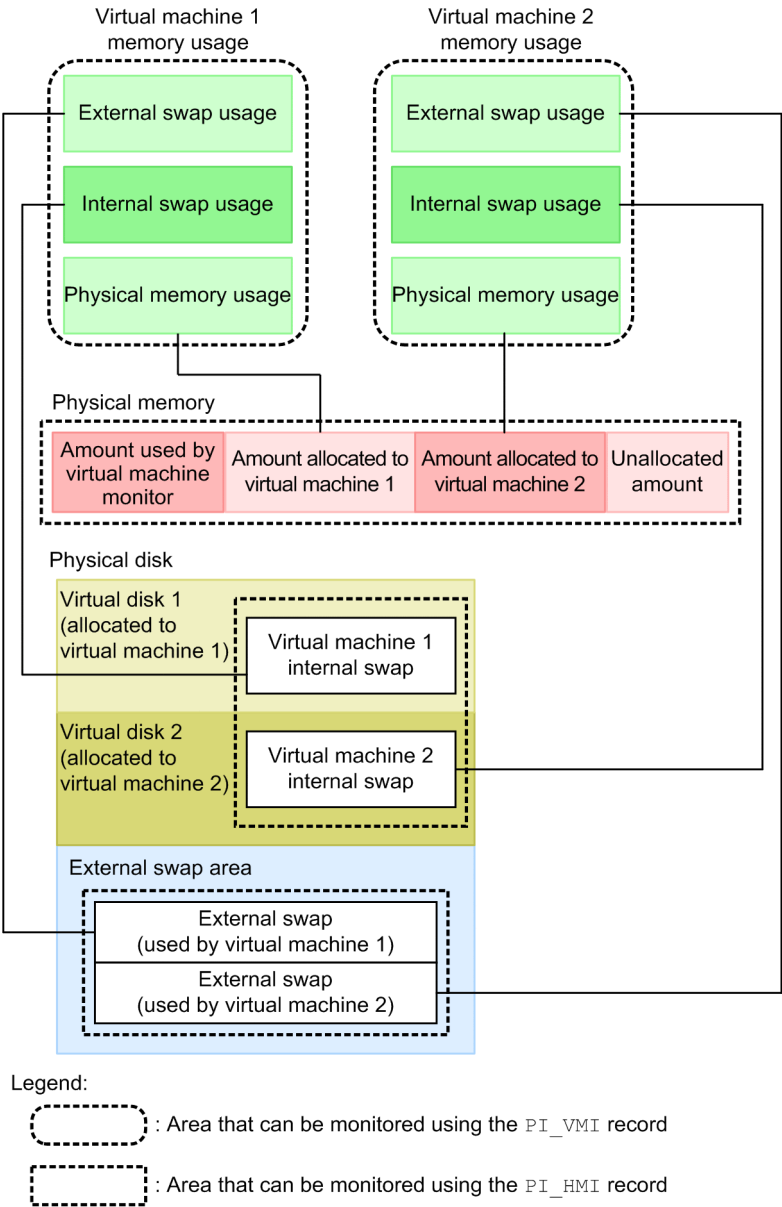
This record is used to monitor the usage of physical memory by the virtual machine monitor and by each virtual machine.

#### 2. `PI_VMI` record

This record is used to monitor the amount of memory resources allocated to each virtual machine.

The following figure shows the range of performance data collected in the `PI_HMI` and `PI_VMI` records.

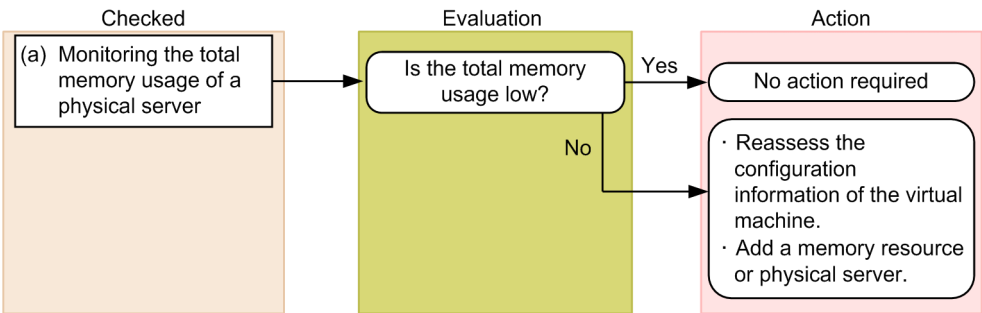
Figure 1–54: Correspondence between records and data collection ranges



## (2) Monitoring examples

This subsection uses an example of monitoring a physical server on which a virtual environment is running to explain the factors that cause insufficient memory resources and how to solve such problems. The following figure shows the items monitored here and the flow of actions to take.

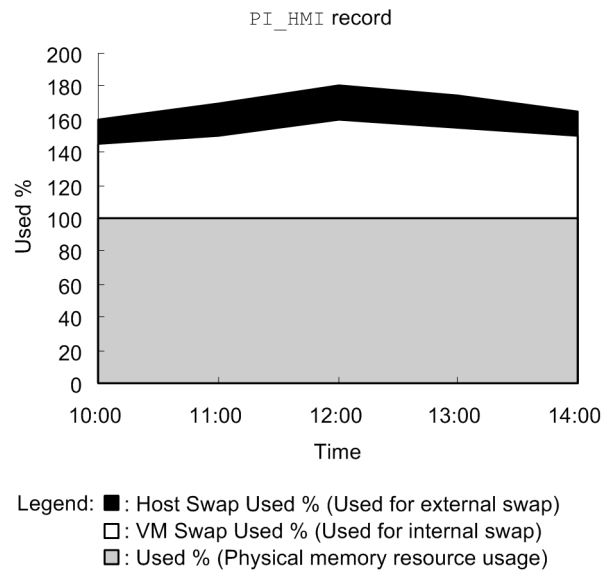
Figure 1–55: Monitored items and flow of actions



## (a) Example of monitoring the total memory usage of a physical server

You can monitor the total memory usage of a physical server in the Total Used % field of the `PI_HMI` record. If this value is large, the memory resources of the physical server are considered insufficient. Note that you can monitor this item by using an alarm that is provided in the monitoring template. The figure below shows a monitoring example.

Figure 1–56: Example of monitoring the total memory usage



*Monitoring template report to be checked*

*Host Memory Used*

*Monitoring template alarm to be checked*

*Host Memory Usage*

In this example, the Total Used % value, which indicates the total of the Used %, VM Swap Used %, and Host Swap Used % values, exceeds 100%. Therefore, it is likely the memory resources for physical servers are insufficient.

In such a case, revise the configuration information for the virtual machines. If the total memory usage value does not improve even after the configuration information has been revised, consider either adding memory resources to the physical server or adding a physical server.

## 1.6.5 Monitoring disk resources

This subsection explains how to monitor the disk resources of a KVM system.

### (1) Overview

In a KVM system, one of the following methods is used to provide disk resources to a virtual machine:

- Allocation to a virtual machine of a virtual hard disk file created on the physical disk
- Allocation of a physical disk to a virtual machine

The OS running on a virtual machine recognizes the allocated disk resources as a normal physical disk.

Information on disk resources can be classified as the disk I/O resource (which includes information such as the disk transfer rate) and the disk space resource (which includes information such as the disk capacity). PFM - RM for Virtual



Machine provides records for these two types of disk resources. When you monitor a KVM system, you can use the records listed below to monitor the disk resources. Note that the `PI_VLDI` record that indicates a virtual machine's disk space resource is not supported.

1. `PI_HPDI` record

This record is used to monitor the performance data of the physical disk. It shows the disk I/O resource as viewed from the physical server.

2. `PI_VPDI` record

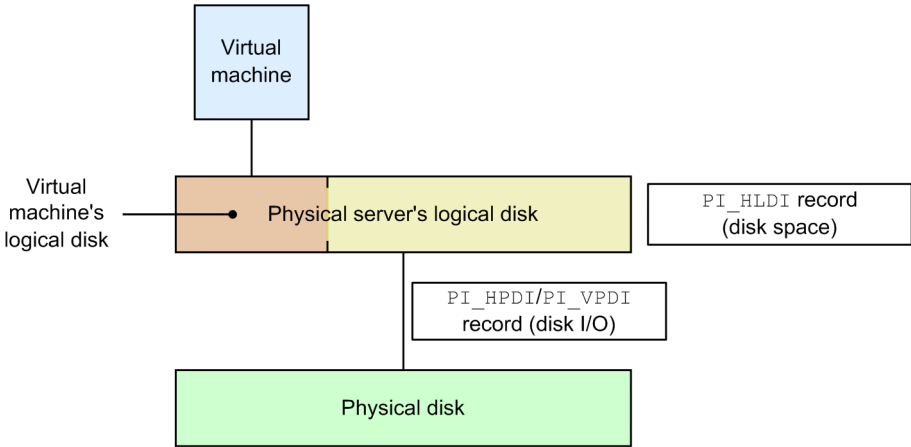
This record is used to monitor the performance data of the physical disk being used by a virtual machine. It shows the disk I/O resource as viewed from the virtual machine.

3. `PI_HLDI` record

This record is used to monitor the performance data of the physical server's logical disk. It shows the disk space resource as viewed from the physical server.

The following figure shows the range of performance data collected in each record.

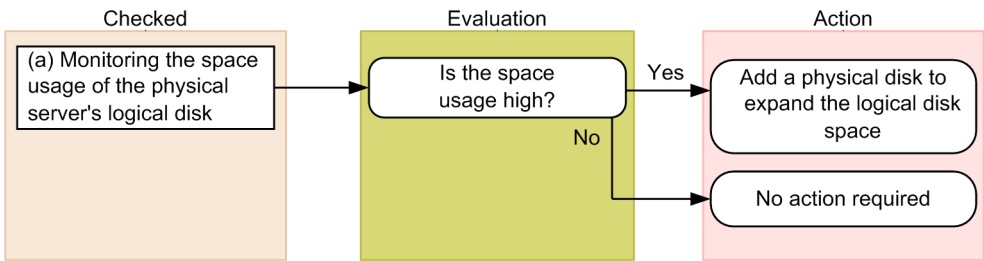
Figure 1–57: Correspondence between records and data collection ranges



## (2) Monitoring examples

This subsection uses an example of monitoring `disk 1` and `disk 2` installed on the physical server to explain the problems that might occur in disk resources and how to solve them. The following figure shows the items monitored here and the flow of actions to take.

Figure 1–58: Monitored items and flow of actions

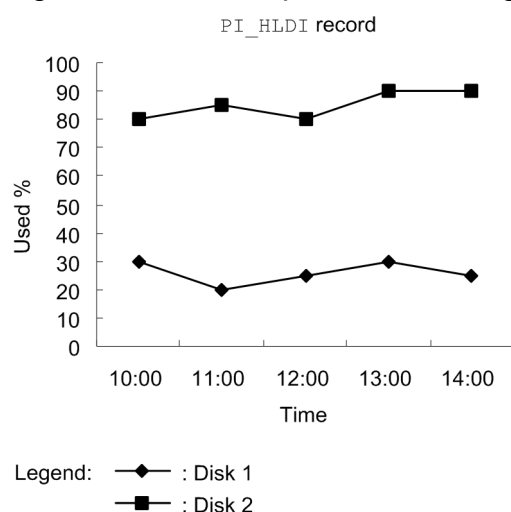


### (a) Example of monitoring the space usage of a physical server's logical disk

You can check whether a physical server's logical disk has sufficient free space based on the space usage.

You can check the space usage in the Used % field of the `PI_HLDI` record. Note that you can monitor this field using an alarm that is provided in the monitoring template. The figure below shows a monitoring example.

Figure 1–59: Example of monitoring the space usage of a physical server's logical disk



*Monitoring template report to be checked*

*Host Disk Used*

*Monitoring template alarm to be checked*

*Host Disk Usage*

In this example, the space usage of Disk 2 is high. If the space usage is high, you can solve this problem by expanding the logical disk space through the addition of a physical disk.

## 1.6.6 Monitoring the network resources

This subsection explains how to monitor the network resources of a KVM system.

### (1) Overview

In a KVM system, multiple virtual machines share the NIC of the physical server. The NIC allocated to each virtual machine is called the *virtual NIC*.

The OS running on a virtual machine recognizes a virtual NIC as a normal NIC.

In a virtual environment, virtual machines use the physical NIC at the same time, and as a result, the network bandwidth that can be used by each virtual machine becomes narrow. Consequently, each virtual machine's network data send/receive speed may decrease.

By monitoring the network's performance data, you can detect such performance deterioration of the virtual machine, and thus you can take the necessary corrective action.

The two records described below are used for monitoring the network resources. For details about the records, see [5. Records](#).

#### 1. `PI_HNI` record

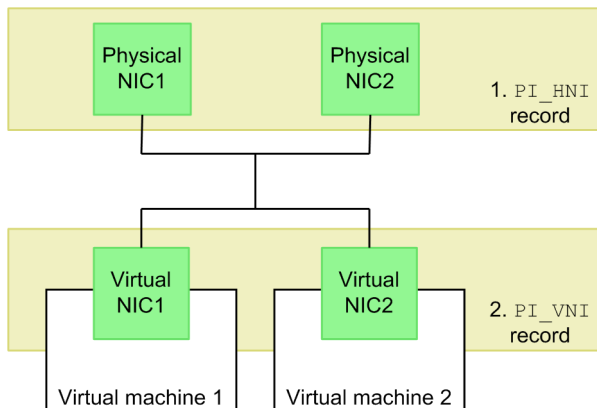
This record is used to monitor the performance data of the physical NIC.

## 2. PI\_VNI record

This record is used to monitor the performance data of the virtual NIC.

The figure below shows the range of performance data collected in each record.

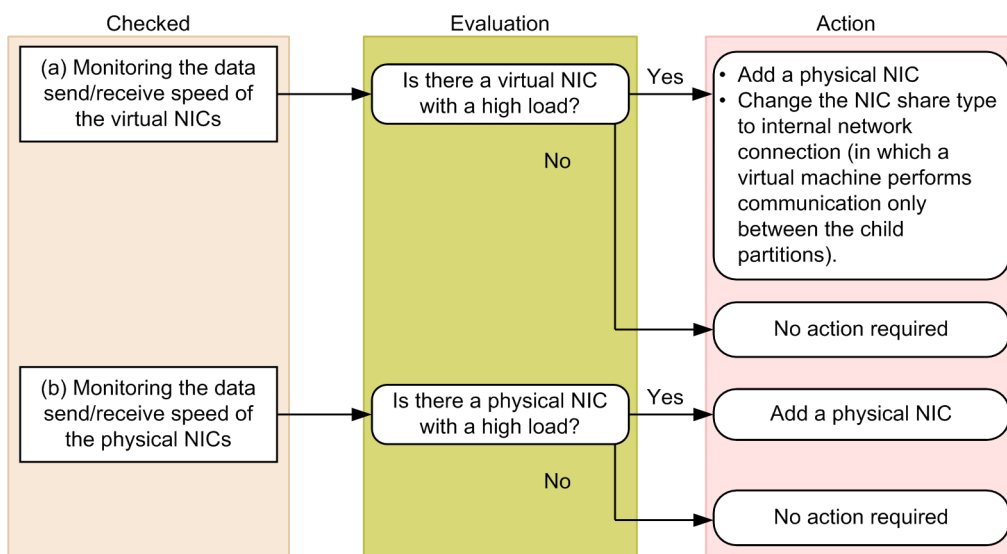
Figure 1–60: Correspondence between records and data collection ranges



## (2) Monitoring examples

Using resource monitoring of virtual NIC1 and NIC2 and physical NIC1 and NIC2 as an example, this subsection explains problems that may occur with network resources, and how to solve them. The figure below shows the items monitored here and the flow of actions to take.

Figure 1–61: Monitored items and flow of actions

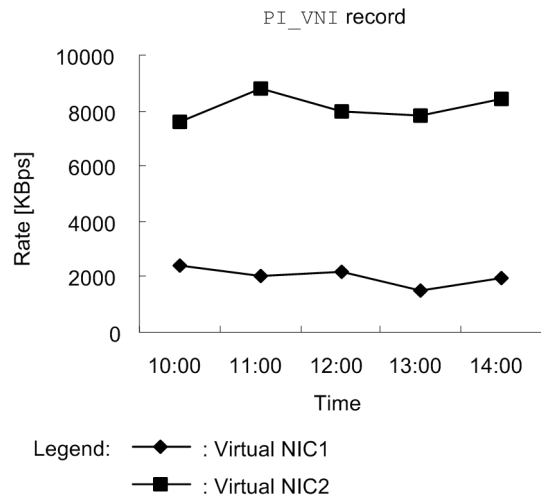


### (a) Example of monitoring the data send/receive speed of a virtual NIC

The load placed on a virtual NIC can be evaluated from the data send/receive speed of the virtual NIC. You can check the data send/receive speed of the virtual NIC in the Rate field of the PI\_VNI record.

The figure below shows an example of monitoring the data send/receive speed of a virtual NIC.

Figure 1–62: Example of monitoring the data send/receive speed of a virtual NIC



*Monitoring template report to be checked*

*VM Network Data*

In this example, the value that indicates the data send/receive speed for virtual NIC 2 is large. This means that virtual NIC 2 is heavily loaded. If there are virtual NICs that are heavily loaded, depending on the communication status of the virtual machine, take either of the following actions:

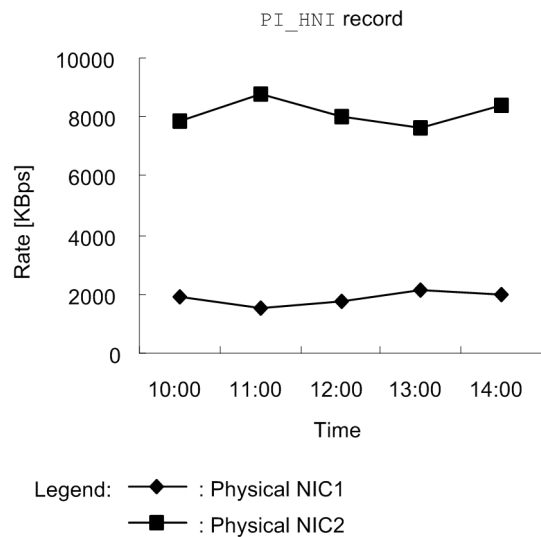
- If the virtual machine communicates with an external network  
Add physical NICs to distribute the load on virtual NICs.
- If the virtual machine communicates with only other virtual machines in the same virtual environment  
Creates a virtual switch for the internal network, and change the NIC that is connected to the other virtual machines.

**(b) Example of monitoring the data send/receive speed of a physical NIC**

The load on a physical NIC can be evaluated from the data send/receive speed of the physical NIC. You can check the data send/receive speed of the physical NIC in the Rate field of the PI\_HNI record.

The figure below shows an example of monitoring the data send/receive speed of a physical NIC.

Figure 1–63: Example of monitoring the data send/receive speed of a physical NIC



*Monitoring template report to be checked*

*Host Network Data*

In this example, the data send/receive speed of physical NIC2 is high, indicating a high load level. If there is a physical NIC with a high load, consider adding a physical NIC.

## 1.7 Description of compound report settings

The table below describes the items in the compound report mentioned in [1.4.4 Monitoring the memory resource](#) and [1.5.3 Monitoring the CPU resource](#). For details about how to create a compound report, see the chapter that explains the creation of reports for operation analysis in the *Job Management Partner 1/Performance Management User's Guide*.

### Points

- A compound report is created for each monitored physical server.
- If you create a compound report without specifying any field display conditions, all virtual machines running on the physical server are displayed. To monitor the information of each virtual machine separately, specify a virtual machine name as a field display condition.

Table 1–1: Compound report setting details

Compound report name	Monitoring template report name	Field display condition	Compound bookmark and group setting				
			Group	Graph type	Group name	Max	Min
Monitoring of virtual machine CPU allocation upper limit	VM CPU Allocation Value	Change the asterisks (*) to the target virtual machine name.	Group 1	Line	VM CPU Allocation Value [MHz]	CPU resource (PI.Clocks value)	0
	VM CPU Used	Change the asterisks (*) to the target virtual machine name.	Group 2	Stacked area	CPU [MHz]	CPU resource (PI.Clocks value)	0
Monitoring of virtual machine memory allocation upper limit	VM Memory Allocation Value	Change the asterisks (*) to the target virtual machine name.	Group 1	Line	VM Memory Allocation Value [MB]	Memory size (PI_VMI.Size value)	0
	VM Swap Used	Change the asterisks (*) to the target virtual machine name.	Group 2	Stacked area	Used [MB]	Memory size (PI_VMI.Size value)	0
Monitoring of working set size of all virtual machines	Host Memory Size	--	Group 1	Line	Memory Size [MB]	Memory size (PI_VMI.Size value)	0
	VM Working Size - Total	--	Group 2	Stacked area	Working Size [MB]	Memory size (PI_VMI.Size value)	0

### Legend:

--: Do not specify.

Max: Maximum value

Min: Minimum value

# 2

## Installation and Setup

This chapter explains how to install and set up PFM - RM for Virtual Machine. For instructions on how to install and set up the entire Performance Management system, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

## 2.1 Installation and setup

---

This section explains how to install and set up PFM - RM for Virtual Machine.

### 2.1.1 Before installation and setup

This subsection explains the items you must check before you install and set up PFM - RM for Virtual Machine.

#### (1) Prerequisite OS

PFM - RM for Virtual Machine runs under the following OS:

- Windows Server 2003<sup>#</sup>
- Windows Server 2008
- Windows Server 2012

#

All versions of Windows Server 2003 (except Windows Server 2003 R2) require a service pack to be installed.

#### (2) Setting up the network environment

The following explains the network environment necessary to run Performance Management.

##### (a) Setting IP addresses

For the PFM - RM for Virtual Machine host, set up an environment in which an IP address can be resolved using a host name. PFM - RM for Virtual Machine cannot start in an environment in which an IP address cannot be resolved.

For the monitoring host name (the name used as the host name of a Performance Management system), you can use either a real host name or an alias name.

- When a real host name is used for the monitoring host name  
Set up the environment such that the host name that can be confirmed using the execution result of the `hostname` command can be used to resolve the IP address.
- When an alias name is used for the monitoring host name  
Set up the environment such that the alias name that has been set can be used to resolve the IP address.

For details about how to set up a monitoring host name, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

Use one of the following to set a host name and an IP address:

- The host information setting file (`jpchosts` file) of Performance Management
- The `hosts` file
- DNS

Note that IP addresses set in the `jpchosts` file are not used to resolve the IP address of a monitoring-target host.





## Important note

- Performance Management can operate in a DNS environment, but it does not support host names in FQDN format. Therefore, specify a monitoring host name without a domain name.
- Performance Management cannot operate on a host to which a dynamic IP address is assigned by DHCP. Therefore, set fixed IP addresses for all hosts on which Performance Management will be installed.
- If Performance Management is being used in multiple LAN environments, set IP addresses in the `jpchosts` file. For details, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.
- Set up the virtual environment so that IP addresses can be resolved when host names are used.

To learn how to change the network configuration or rename host names in a Performance Management system, see the chapter on changing the Performance Management system configuration in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

## (b) Settings for using IPv6

Because Performance Management supports network configurations for IPv4 environments and IPv6 environments, you can use Performance Management in a network configuration that contains both IPv4 and IPv6 environments.

PFM - RM for Virtual Machine can communicate with PFM - Manager by using IPv6.

Note, however, that this applies only when Windows Server 2008 R2 or Windows Server 2012 runs on a host with PFM - RM for Virtual Machine installed and Windows Server 2008 R2, Windows Server 2012 or Linux runs on a host with PFM - Manager installed.

For details about the scope of communication in IPv4 and IPv6 environments, see *K. About Communication in IPv4 Environments and IPv6 Environments*.

To use IPv6 for communication, IPv6 must be enabled on both the PFM - Manager host and the PFM - RM host by using the `jpccconf ipv6 enable` command. The following describes when you need to execute this command.

Cases when the `jpccconf 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 `jpccconf 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 `jpccconf ipv6 enable` command:

```
jpccconf ipv6 enable
```

For details about the `jpccconf 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 `jpccconf 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 Virtual Machine, specify the name of a monitored host where name resolution can be performed.

Communication between PFM - RM for Virtual Machine 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 Virtual Machine 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) Setting port numbers

The services of Performance Management programs are assigned to the default port numbers shown in the table below. Port numbers that are not being used in the system are automatically assigned to all other services or programs every time a service is started. If you are using Performance Management in a firewall environment, assign fixed port numbers. For details about how to assign fixed port numbers, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

Table 2–1: Default port numbers and Performance Management program services

Service explanation	Service name	Parameter	Port number	Remarks
Service configuration information management function	Name Server	jplpcnsvr	22285	Port number used by the Name Server service of PFM - Manager. This port number is set for all hosts of Performance Management.
OpenView linkage facility	NNM Object Manager	jplpcovsvr	22292	Port number used by the OpenView linkage facility of PFM - Manager and PFM - Base for communication between the map manager and the object manager. This port number is set for hosts on which PFM - Manager and PFM - Base are installed.
Service status management function	Status Server	jplpcstatsvr	22350	Port number used by the Status Server service of PFM - Manager and PFM - Base. This port number is set for hosts on which PFM - Manager and PFM - Base are installed.
Monitoring console communication facility	View Server	jplpcvsvr	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/ITSMLM linkage facility	JP1/ITSMLM	--	20905	The port number set by JP1/ITSMLM.

Legend:

--: None

Configure the network in such a way that these port numbers used by PFM - RM for Virtual Machine can be used for communications.

## (d) SSL utilization setup

PFM - RM for Virtual Machine acquires the performance data of a virtual environment through a network. If the virtual environment to be monitored is VMware, you can use SSL to encrypt communications between PFM - RM for Virtual Machine and the virtual environment.

The virtual environment side specifies whether to enable communications that use SSL. For details about setup, see the documentation for the virtual environment software.

Additionally, during setup of PFM - RM for Virtual Machine you need to specify whether to use SSL, in accordance with the virtual environment configuration. The settings for enabling SSL communication are specified during instance environment setup and monitoring target setup. For details, see [2.1.4\(3\) Setting up an instance environment](#) and [2.1.4\(4\) Setting up monitoring targets](#).

## (3) OS user permissions necessary for installation

When you install PFM - RM for Virtual Machine, you must perform the installation from an account that has Administrator permissions.

## (4) Prerequisite programs

This subsection explains the programs required for installing PFM - RM for Virtual Machine. The following figure shows the program configuration diagram.

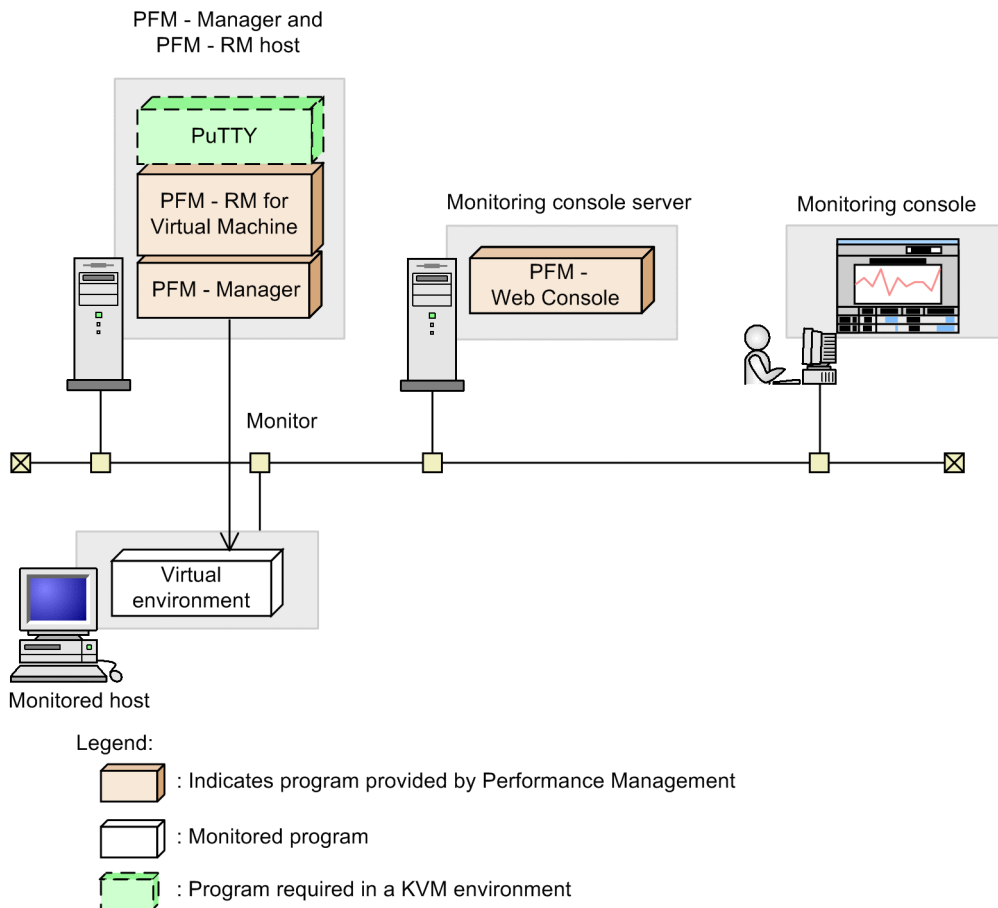
Note that the term *PFM - RM host* means a host on which PFM - RM for Virtual Machine is installed.

Also note that this subsection explains two typical program configurations separately. Decide which configuration you want to use depending on the system environment.

Installing PFM - RM for Virtual Machine on a PFM - Manager host:

In this program configuration, PFM - RM for Virtual Machine is installed on a host on which PFM - Manager is installed. The following figure shows an example of this program configuration.

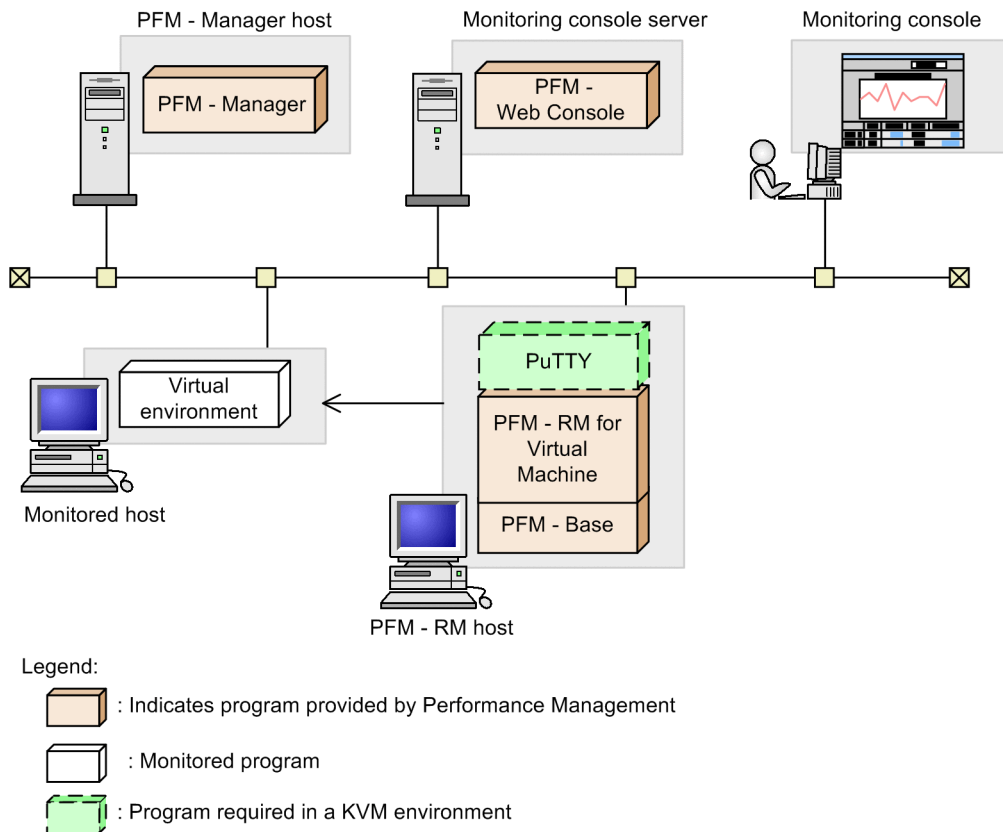
Figure 2–1: Configuration in which PFM - RM for Virtual Machine is installed on a host on which PFM - Manager is installed



Installing PFM - RM for Virtual Machine on a host on which PFM - Manager is not installed:

In this program configuration, PFM - RM for Virtual Machine is installed on a host on which PFM - Manager is not installed. To use this configuration, PFM - Base must also be installed on the host on which PFM - RM for Virtual Machine is installed. The following figure shows an example of this program configuration.

Figure 2–2: Configuration in which PFM - RM for Virtual Machine is installed on a host on which PFM - Base is installed



If the virtual environment of the monitoring target is a VMware or KVM environment, PFM - RM for Virtual Machine uses the Microsoft XML Parser Version 3.0 component that is included in Internet Explorer. Therefore, Internet Explorer must be installed.

## (a) Performance Management programs

Before you can install PFM - RM for Virtual Machine on a host, PFM - Manager or PFM - Base must be installed on that host as a prerequisite program for Performance Management.

If you want to install PFM - RM for Virtual Machine on a host on which PFM - Manager is installed, you do not need to install PFM - Base. If you want to install multiple PFM - RM instances on a host on which PFM - Base is installed, only one instance of PFM - Base is required.

In addition, PFM - Web Console is required to monitor the operating status of monitoring targets by using PFM - RM for Virtual Machine.

## (b) Virtual environments supported as the monitoring target

The following virtual environments are supported as the monitoring target.

For VMware:

- VMware ESX V3.0
- VMware ESX V3.5
- VMware ESXi V3.5 Embedded
- VMware ESXi V3.5 Installable

- VMware ESX V4.0
- VMware ESXi V4.0 Embedded
- VMware ESXi V4.0 Installable
- VMware ESXi V4.1 Embedded
- VMware ESXi V4.1 Installable
- VMware vSphere ESXi V5.0
- VMware vSphere ESXi V5.1
- VMware vSphere ESXi V5.5

*For Hyper-V:*

- 2008 Hyper-V
- 2008 R2 Hyper-V
- 2012 Hyper-V
- 2012 R2 Hyper-V

*For KVM:*

- KVM (Red Hat Enterprise Linux 6 (64-bit x86\_64))

## **(5) Tools that must be started on the virtual environment side when VMware is monitored**

Before you monitor the information of a virtual machine running on VMware, start VMware Tools on the virtual machine you intend to monitor.

The host name of the virtual machine (VM Host Name field) can be acquired only when `vmware-tools` is running.

- When the OS of the monitored virtual machine is Windows

During installation of VMware Tools, a dialog box for selecting program functions opens. In this dialog box, leave all default settings intact when you install VMware Tools. The following items are selected as the default settings:

- SCSI driver
- SVGA driver
- Mouse driver
- VMXNET NIC driver
- Memory control driver
- FileSystem Sync Driver
- VMWCI-Driver

- When the OS of the monitored virtual machine is Linux

During installation of VMware Tools, a dialog box for selecting program functions is not displayed. Follow the normal installation procedure.

- When the OS of the monitored virtual machine is neither Windows nor Linux

For instructions on how to install VMware Tools, contact VMware Corporation.

## (6) Installation and setup in a cluster system

When you install and set up PFM - RM for Virtual Machine in a cluster system, the prerequisite network environment and program configurations are different from those used to set up a normal configuration. Tasks at the executing node and standby node are also required. For details, see [3. Operations in a Cluster System](#).

## (7) Notes

This subsection provides notes related to the installation and setup of Performance Management.

### (a) Note on the registry

Operation of PFM - RM for Virtual Machine is supported only in an OS environment with standard settings. Performance data might not be collected correctly if special OS settings are specified in some way, such as using the registry editor to edit the registry directly. This is also true if the special settings have been published in the Microsoft Knowledge Base.

### (b) Note on the environment variable

Performance Management uses `JPC_HOSTNAME` as the environment variable; therefore, the user must not specify it as an environment variable. If it is specified as an environment variable, Performance Management will not operate correctly.

### (c) Notes on installing and setting up multiple Performance Management programs on the same host

You can install multiple Performance Management programs; that is, PFM - Manager, PFM - Web Console, and PFM - RM for Virtual Machine, on the same host. When you do so, note the following.

*Tip:*

To maximize system performance and reliability, we recommend that you run PFM - Manager, PFM - Web Console, and PFM - RM for Virtual Machine on separate hosts.

- If you install PFM - Manager and PFM - RM for Virtual Machine on the same host, you do not need PFM - Base. In this case, since the prerequisite program for PFM - RM for Virtual Machine is PFM - Manager, first install PFM - Manager and then install PFM - RM for Virtual Machine.
- You cannot install PFM - Base and PFM - Manager on the same host. To install PFM - Manager on a host that has PFM - Base and PFM - RM for Virtual Machine installed, you must first uninstall all Performance Management programs except PFM - Web Console, and then install PFM - Manager, followed by PFM - RM for Virtual Machine. Likewise, to install PFM - Base on a host that has PFM - Manager and PFM - RM for Virtual Machine installed, first uninstall all Performance Management programs except PFM - Web Console, and then install PFM - Base, followed by PFM - RM for Virtual Machine.
- When you install PFM - RM for Virtual Machine on a host that has PFM - Manager installed, the PFM - Manager of the local host becomes the PFM - Manager at the connection destination. In this case, you cannot change the PFM - Manager at the connection destination to the PFM - Manager of a remote host. To connect to the PFM - Manager of a remote host, make sure that the host on which you intend to install PFM - RM for Virtual Machine does not have PFM - Manager installed.
- When you install PFM - Manager on a host that has PFM - RM for Virtual Machine installed, the PFM - Manager at the connection destination of PFM - RM for Virtual Machine is reset to the local host name. Check the setting result that is output to the common message log.
- To install PFM - RM for Virtual Machine on a host that has PFM - Web Console installed, close all browser windows before you perform installation.

- When you perform a new installation of a Performance Management program, the status management function is enabled by default. However, when you perform an upgrade installation from a version earlier than 08-00 to version 08-00 or a later version, the status management function settings remain as they were in the earlier version. For details about how to change the settings for the status management function, see the chapter that explains Performance Management error detection in the *Job Management Partner 1/Performance Management User's Guide*.

## (d) Notes on version upgrading

Note the following when you upgrade from an earlier version of PFM - RM for Virtual Machine to a later version.

For details about version upgrading, see the appendix section of the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

- Before you install Performance Management programs, stop all Performance Management programs and services on local hosts. Stop all services on both physical hosts and logical hosts. For details about how to stop services, see the chapter that explains startup and termination of Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.
- When you install PFM - RM for Virtual Machine on a host that has Performance Management programs installed, the installation path for PFM - RM for Virtual Machine is the same as the installation path for all previously installed Performance Management programs except PFM - Web Console. To change the installation path, you must first delete all previously installed Performance Management programs except PFM - Web Console, and then reinstall them.
- You cannot install PFM - Base and PFM - Manager on the same host. To install PFM - Manager on a host that has PFM - Base and PFM - RM for Virtual Machine installed, you must first uninstall all Performance Management programs except PFM - Web Console, and then install PFM - Manager, followed by PFM - RM for Virtual Machine. Likewise, to install PFM - Base on a host that has PFM - Manager and PFM - RM for Virtual Machine installed, first uninstall all Performance Management programs except PFM - Web Console, and then install PFM - Base, followed by PFM - RM for Virtual Machine.
- 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.

## (e) Note on linkage with other systems

- Before you install Performance Management programs in an environment that is linked with NNM, stop the OpenView linkage facility and `ovw`.

## (f) Other notes

- Before you perform new installation of Performance Management programs in an environment that does not yet have any of these programs installed, make sure that the target folder does not contain any files or folders.
- If you install a Performance Management program while another program (e.g., Windows Event Viewer) that references a Performance Management program, service, or file is running, a message asking the user to restart the system may be displayed. In this case, restart the system as instructed by the message, and then complete the installation process.
- If you install a Performance Management program while another program (e.g., Windows Event Viewer) that references a Performance Management program, service, or file is running, file expansion may fail if there is a disk



space shortage, or if you do not have the proper folder permissions. If other programs are running that reference a Performance Management program, service, or file, stop them all, and then reinstall the Performance Management program. If there is a disk space shortage, or if you do not have the proper folder permissions, solve these problems first, and then reinstall the Performance Management program.

- After you have performed a new installation of a Performance Management program, you must restart the system to complete the installation process. When you perform overwrite installation or upgrade installation, a message asking the user to restart the system may be displayed. In this case also, restart the system as instructed by the message, and then complete the installation process.
- Before you install a Performance Management program, check whether any of the security-related programs are installed. If one is installed, take the necessary steps explained below.
  - For a security-monitoring program  
Either stop the security-monitoring program or change its settings so that it will not prevent installation of Performance Management programs.
  - For a virus-detection program  
We recommend that you first stop the virus-detection program and then install Performance Management programs.  
If a virus-detection program is running while you are trying to install a Performance Management program, it may slow down or prevent installation, or it may result in an incorrect installation.
  - For a process-monitoring program  
Either stop the process-monitoring program or change its settings so that it will not monitor any Performance Management service or process, or any service or process of a shared component.  
If a process-monitoring program starts or stops these programs or services during the installation of a Performance Management program, the installation process may fail.
- You can install PFM - RM for Virtual Machine on one of the virtual machines in a virtual environment, and have it monitor other virtual machines. However, in this operating mode, PFM - RM for Virtual Machine will stop if the virtual environment stops. Therefore, we recommend that you install PFM - RM for Virtual Machine in an environment that is different from the monitored virtual environment.

## (8) Preparation for collecting data in the event of an error

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, use one of the following methods to set up output of these dumps in advance.

### (a) Settings in Windows Server 2003

To enable a memory dump:

1. In **Control Panel**, double-click **System**.
2. Open the **Advanced** page. Under **Startup and Recovery**, click the **Settings** button.
3. From the **Write debugging information** drop-down list, select **Complete memory dump**, and then, specify the output destination file.

#### Important note

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

To enable a crash dump:

1. From the **Start** menu, select **Run**.
2. In the text box, enter `drwtsn32`, and then click the **OK** button.  
The Dr. Watson dialog box opens.
3. Select the **Create Crash Dump File** check box. Then, in the **Crash Dump** text box, specify the output destination file.
4. Click the **OK** button.

### Important note

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

## (b) Setting method for Windows Server 2008, and Windows Server 2012

*Settings for outputting user mode process dumps:*

You can use the following registry setting to obtain user mode process dumps of data that you can investigate for troubleshooting when an application program terminates:

```
\\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 for other application programs. Make sure you keep this in mind when you specify that user mode process dumps are to be output.
- When user mode process dumps are output, available disk space can be adversely affected. Make sure that you specify a dump output folder that has enough disk space for the dumps.

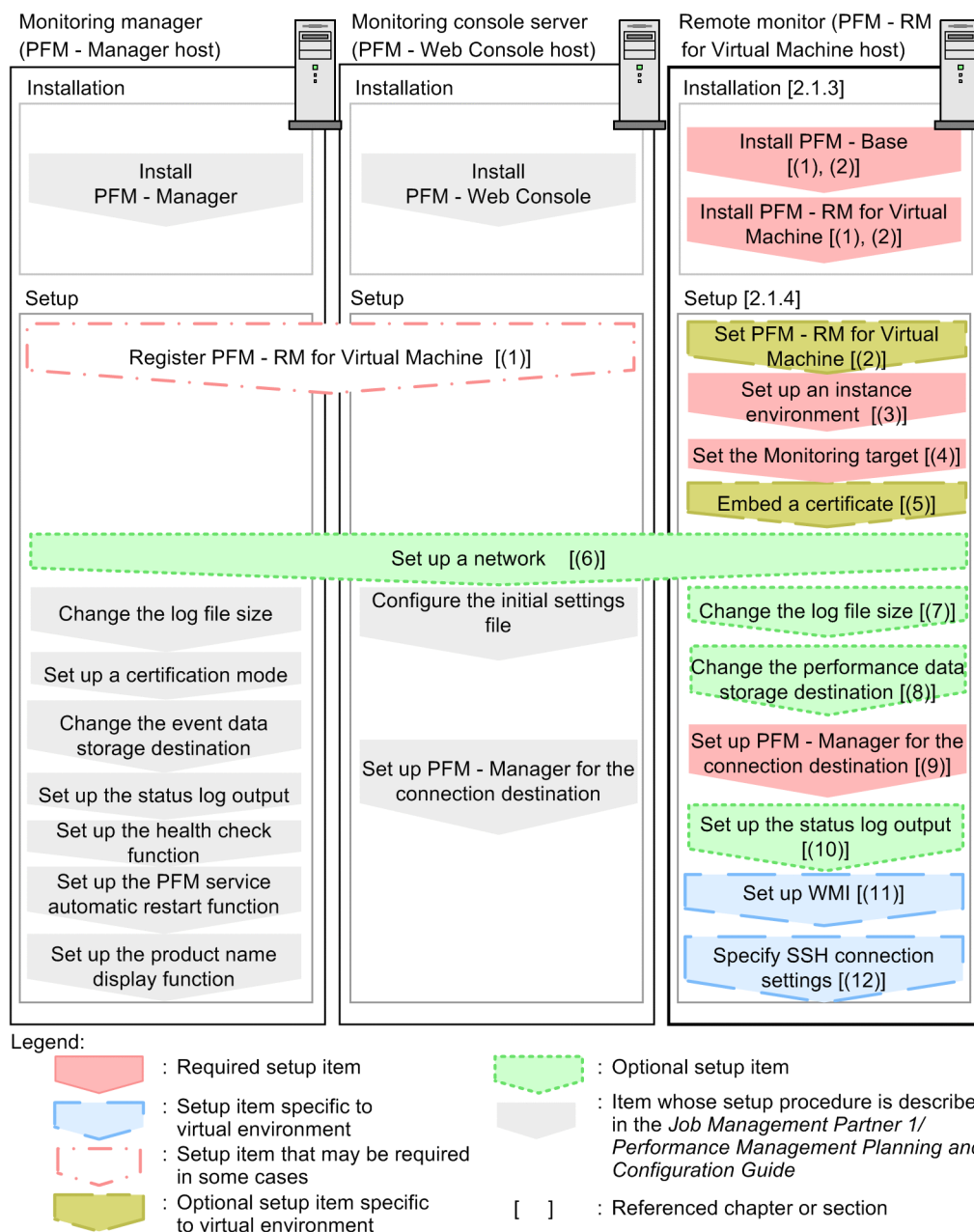
## 2.1.2 Installation and setup flow

This subsection explains the flow for installing and setting up PFM - RM for Virtual Machine.

For details about how to install and set up PFM - Manager and PFM - Web Console, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

The following figure shows an overview of PFM - RM for Virtual Machine installation and setup.

Figure 2–3: Installation and setup flow



## 2.1.3 Installation procedure

This subsection explains how to install PFM - RM for Virtual Machine programs, including how to install programs from the provided CD-ROM.

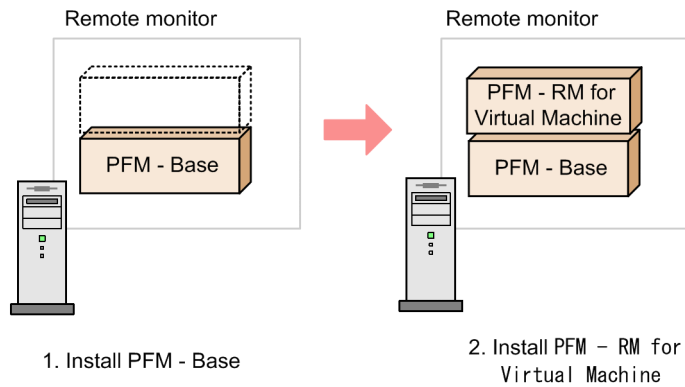
### (1) Program installation sequence

First install PFM - Base, and then install PFM - RM for Virtual Machine. You cannot install PFM - RM for Virtual Machine on a host that does not have PFM - Base installed.

To install PFM - RM for Virtual Machine on the same host as PFM - Manager, first install PFM - Manager, followed by PFM - RM for Virtual Machine.

If you install multiple PFM - RM for Virtual Machine instances on the same host, their installation order does not matter.

Figure 2–4: Program installation sequence



## (2) Program installation procedure

To install Performance Management programs on a Windows host, you can either use the provided CD-ROM, or you can use JP1/Software Distribution to remotely install the programs. 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 all operating systems*

If Performance Management programs or services have been activated on the target hosts, stop all of these programs and services. Stop all services on both physical hosts and logical hosts. For details about how to stop services, see the chapter that explains startup and termination of Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

### *Precautions regarding installation in a Windows Server 2008 or a Windows Server 2012 environment*

If user account control functionality (UAC) is enabled on the operating system, 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 Performance Management programs using the provided CD-ROM:

1. Log on to the host on which you intend to install the Performance Management programs as an administrator.
2. Stop Performance Management programs and services.  
If any Performance Management programs and services are running, stop all of them.
3. Insert the provided medium into the CD-ROM drive.

Proceed with installation by following the instructions of the installer that starts.

The following types of information must be defined during installation:

- User information  
Enter information such as a user name.
- Installation folder  
Specify the folder in which to install the Performance Management programs.  
The installation folder is created when you specify a folder in the Select Directory dialog box and click **OK**. If you create a folder by mistake, delete it after installation.
- Program folder  
Specify the program menu name to be registered in **Start - All Programs** in Windows.

By default, **Performance Management** is registered.

### Reference note

The installation folder for Performance Management programs other than PFM - Web Console can be specified when such a program is first installed on the target host.

In the second and subsequent installations of Performance Management programs, the installation folder specified during the first installation of the Performance Management programs will be used as the installation folder.

## 2.1.4 Setting up PFM - RM for Virtual Machine

This subsection explains the setup for operating PFM - RM for Virtual Machine. The setup procedure depends on the virtual environment to be monitored. The table below lists the setup items required for each virtual environment.

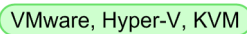



Table 2–2: Setup items required for each virtual environment

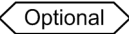
Setup item	VMware	Hyper-V	KVM
(1) Registering PFM - RM for Virtual Machine	Y	Y	Y
(2) Setting PFM - RM for Virtual Machine	Y	N	N
(3) Setting up an instance environment	Y	Y	Y
(4) Setting up monitoring targets	Y	Y	Y
(5) Embedding a certificate	Y	N	N
(6) Network settings	Y	Y	Y
(7) Changing the log file size	Y	Y	Y
(8) Changing the performance data storage destination	Y	Y	Y
(9) Setting up PFM - Manager at the connection destination of PFM - RM for Virtual Machine	Y	Y	Y
(10) Setting the action log output	Y	Y	Y
(11) Setting WMI	N	Y	N
(12) Setting SSH	N	N	Y

Legend:

Y: Setup is required

N: Setup is not required

The icon  ,  ,  or  indicates a setup item required for the indicated virtual environment.

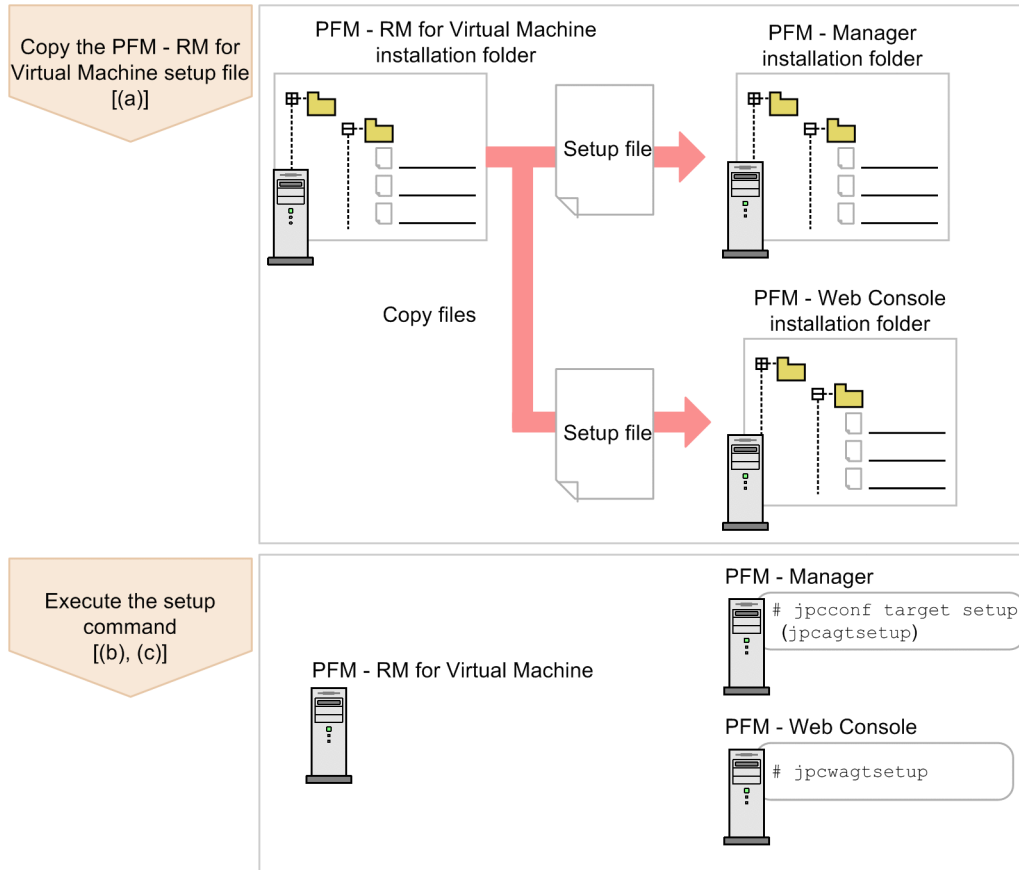
The icon  indicates either a setup item that may be required depending on the environment that is used, or an optional setup item that is available for changing default settings.

## (1) Registering PFM - RM for Virtual Machine VMware, Hyper-V, KVM

To use PFM - Manager and PFM - Web Console to centrally manage PFM - RM for Virtual Machine, you need to register PFM - RM for Virtual Machine in PFM - Manager and PFM - Web Console.

The figure below shows the flow for registering PFM - RM for Virtual Machine.

Figure 2–5: PFM - RM for Virtual Machine registration flow



Legend:

[ ] : Referenced section(s)

### Important note

- Register PFM - RM for Virtual Machine before setting up the instance environment.
- If you add the same version of PFM - RM for Virtual Machine to a Performance Management system in which PFM - RM for Virtual Machine information is already registered, there is no need to register PFM - RM for Virtual Machine.
- To install different versions of PFM - RM for Virtual Machine on different hosts, set up the earlier version first, and then set up the later version.
- If you install PFM - RM for Virtual Machine on the same host as PFM - Manager, the `jpcconf agent setup` command is automatically executed. When the message `KAVE05908-I New agent setup ended successfully` is output to the common message log, check the result. If the command was not executed correctly, execute it again. For details about how to execute the command, see the chapter that explains commands in the manual *Job Management Partner 1/Performance Management Reference*.

- During the task of registering the PFM - RM for Virtual Machine information, a folder named `RM VirtualMachine` is created under the **Reports** and **Alarms** tabs in PFM - Web Console. If you had already created a folder or file named `RM VirtualMachine` under the **Reports** tab on your own, change its name before you proceed with registration.

## (a) Copying the PFM - RM for Virtual Machine setup files

Copy the setup files located on the host on which you installed PFM - RM for Virtual Machine to the host on which you installed PFM - Manager and PFM - Web Console.

To copy the setup files:

- If PFM - Web Console is running, stop it.
- Copy the setup files of PFM - RM for Virtual Machine in the binary mode.

The table below shows the location where the files are stored and the location to which the files are to be copied.

**Table 2–3: Setup files to copy**

Copying source (PFM - RM for Virtual Machine setup file)	Copying destination		
	PFM program name	OS	Destination folder
<code>installation-folder\setup\jpcagt8w.EXE</code>	PFM - Manager	Windows	<code>PFM-Manager-installation-folder\setup\</code>
<code>installation-folder\setup\jpcagt8u.Z</code>		UNIX	<code>/opt/jp1pc/setup/</code>
<code>installation-folder\setup\jpcagt8w.EXE</code>	PFM - Web Console	Windows	<code>PFM-Web-Console-installation-folder\setup\</code>
<code>installation-folder\setup\jpcagt8u.Z</code>		UNIX	<code>/opt/jp1pcwebcon/setup/</code>

## (b) Using the PFM - Manager host to execute the setup command

Use PFM - Manager host to execute the following command for setting up PFM - RM for Virtual Machine:

```
jpcconf agent setup -key RMVM (jpcagtsetup agt8)
```

### Important note

If you execute the `jpcconf agent setup` command when the Performance Management programs and services of the local host on which you are executing the setup command have not stopped completely, an error may occur. In this case, first make sure that the Performance Management programs and services have stopped completely, and then re-execute the `jpcconf agent setup` command.

After this task has been completed, you can delete the PFM - RM for Virtual Machine setup file located on the PFM - Manager host.

## (c) Using the PFM - Web Console host to execute the setup command

Use PFM - Web Console host to execute the following command for setting up PFM - RM for Virtual Machine:

```
jpcwagtsetup
```



After this task has been completed, you can delete the PFM - RM for Virtual Machine setup file located on the PFM - Web Console host.

## (2) Setting PFM - RM for Virtual Machine VMware Optional

When you use VMware with Hyper-Threading enabled and monitor the Host Status (PI) record or the VM Status (PI\_VI) record, you need setup the PFM - RM for Virtual Machine. The following explains how to perform the setting up PFM - RM for Virtual Machine.

### (a) Editing the PFM - RM for Virtual Machine setup file

Edit the following file to change setting up PFM - RM for Virtual Machine:

```
Installation-folder\agt8\agent\jpcagt8cfg.ini
```

### (b) Contents of the PFM - RM for Virtual Machine setup file

The following explains the format of the PFM - RM for Virtual Machine setup file.

```
[vmware]
UseHTPhysicalClocks={N | Y}
```

Description:

[vmware] is the section name.

UseHTPhysicalClocks key is set to disable (N) or enable (Y).

Disable (N) (default value):

Specify N when Hyper-Threading is disabled in all monitored VMware environments (including environments without Hyper-Threading function).

Enable (Y):

Specify Y when a monitored environment has VMware with Hyper-Threading enabled.

The following table shows the correspondence between VMware with Hyper-Threading and the UseHTPhysicalClocks key setting.

Table 2–4: Correspondence between VMware with Hyper-Threading and the UseHTPhysicalClocks key setting

No.	Hyper-Threading in the VMware environment	Setting UseHTPhysicalClocks key	
		Disable (N) (default value)	Enable (Y)
1	Disabled (including environments without Hyper-Threading function)	Displays the data based on the physical processor cores.	Displays the data based on the physical processor cores. Does not depend on whether Hyper-Threading is disabled or enabled. #2
2	Enabled	Displays the data based on the logical processor cores. #1	

#1

The value of the Used % field in the Host Status (PI) record or the value of the Host Used % field in the VM Status (PI\_VI) record depends on the CPU resources used, is about 50 - 70 percent of the maximum.

#2

The value of the Clocks field in Host Status (PI) record is based on the physical processor cores. Therefore, the value of the Used % field in the Host Status (PI) record or the value of the Host Used % field in the VM Status (PI\_VI) record depends on the CPU resources used, is 100 percent of the maximum.



## Notes:

If the PFM - RM for Virtual Machine setup file does not exist or the file contents are invalid, the system performs same as for the earlier version (for example, `UseHTPhysicalClocks=N`).

When N is specified for the `UseHTPhysicalClocks` key and monitoring is of VMware with Hyper-Threading enabled, if you do not set thresholds and conditions that match the monitoring target, the alarm will not be detected correctly. In such a case, set thresholds and conditions that match the monitoring target, or specify `UseHTPhysicalClocks=Y`.

### Example:

If the CPU resources used are high, no alarm is detected.

If you set a warning condition for when the value of the `Used` field exceeds 80 %, and specify `UseHTPhysicalClocks=N` and monitor VMware with Hyper-Threading enabled, the value of the `Used` field will not exceed 80 % and so no alarm is detected.

## (3) Setting up an instance environment VMware, Hyper-V, KVM

To set up an instance environment, you specify instance information. To set up multiple instance environments, you repeat the setup procedure.

Specify the instance information of PFM - RM for Virtual Machine. You specify this information from the PFM - RM host.

The table below shows the types of instance information to specify. Before you begin the setup procedure, check the following information.

Table 2–5: Instance information of PFM - RM for Virtual Machine

Item <sup>#1</sup>	Explanation	Value that can be set	Default value
VM_Type <sup>#2</sup>	Specifies the type of virtual environment to be monitored.	Character string not exceeding 8 bytes. Specify the following value, depending on the monitoring target: <ul style="list-style-type: none"><li>For VMware: <code>vmware</code></li><li>For Hyper-V: <code>hyperv</code></li><li>For KVM: <code>kvm</code></li></ul>	<code>vmware</code>
Interval	Specifies the collection process execution interval. <sup>#3</sup>	60 through 3,600 (units: seconds)	300
Std_Category <sup>#4</sup>	Specifies whether the collection process outputs the basic information (PI, VI, and VM records) to a temporary performance information file.	Either of the following values: <ul style="list-style-type: none"><li>Y: Outputs the information.</li><li>N: Does not output the information.</li></ul>	Y
Cpu_Category <sup>#4</sup>	Specifies whether the collection process outputs the CPU information (HCI and VCI records) to a temporary performance information file.	Either of the following values: <ul style="list-style-type: none"><li>Y: Outputs the information.</li><li>N: Does not output the information.</li></ul>	Y
Memory_Category <sup>#4</sup>	Specifies whether the collection process outputs the memory information (HMI and VMI records) to a temporary performance information file.	Either of the following values: <ul style="list-style-type: none"><li>Y: Outputs the information.</li><li>N: Does not output the information.</li></ul>	Y

Item <sup>#1</sup>	Explanation	Value that can be set	Default value
Disk_Category <sup>#4</sup>	Specifies whether the collection process outputs the disk information (HPDI, VPDI, HLDI, and VLDI records) to a temporary performance information file.	Either of the following values: <ul style="list-style-type: none"> <li>Y: Outputs the information.</li> <li>N: Does not output the information.</li> </ul>	Y
Network_Category <sup>#4</sup>	Specifies whether the collection process outputs the network information (HNI and VNI records) to a temporary performance information file.	Either of the following values: <ul style="list-style-type: none"> <li>Y: Outputs the information.</li> <li>N: Does not output the information.</li> </ul>	Y
HostUserID <sup>#5#6</sup>	Specifies the user ID of the PFM - RM host.	Character string not exceeding 256 bytes. Note that the following character cannot be used: <ul style="list-style-type: none"> <li>Tab character</li> </ul>	(None)
HostPassword <sup>#5</sup>	Specifies the password for the user ID that was specified in HostUserID. The characters entered for this item are not displayed on the screen. When you enter a value for this item, the system will ask you to re-enter the value.	Character string not exceeding 256 bytes. Note that the following character cannot be used: <ul style="list-style-type: none"> <li>Tab character</li> </ul>	(No password)
HostDomain <sup>#5</sup>	Specifies the name of the domain that the PFM - RM host belongs to. This specification is unnecessary if the host belongs to a work group.	Character string not exceeding 256 bytes. Note that the following character cannot be used: <ul style="list-style-type: none"> <li>Tab character</li> </ul>	(None)
SSH_Client	Specifies the absolute path of the SSH client (PuTTY) execution module (plink.exe). You do not need to enclose the path name in double quotation marks (") even if it includes spaces.	Character string not exceeding 256 bytes. Note that the following character cannot be used: <ul style="list-style-type: none"> <li>Tab character</li> </ul>	(None)
Log_Size	Specifies the maximum size of a single file for the collected logs. <sup>#7</sup>	1-32 (megabytes) A value of 16 or greater is recommended.	16
UseVcpuMax	Specifies which is to be used as the CPU resource clock frequency: the frequency assigned to the virtual machine or the clock frequency of the physical CPU. To use the frequency assigned to the virtual machine, specify Y. To use the frequency of the physical CPU, specify N. <sup>#8</sup>	{ Y   N } Specification of this item is valid only for monitoring targets that use VMware. For other monitoring targets, specification of this item is ignored.	N

## #1

To execute the `jpccconf target setup` command in non-interactive mode, use this item name as the product-specific label in the definition file. For details about executing the command in non-interactive mode, see the chapter on commands in the manual *Job Management Partner 1/Management Reference*.

## #2

Cannot be reset using the `jpccconf inst setup` command.

#3

Depending on the intervals at which Agent Collector collects information and at which a temporary performance information file is created, the contents of the file might not be updated, causing the same data to be collected. If this problem occurs, review and correct the settings of these intervals. For details about setting these intervals, see [1.3.1 General procedure for performance data collection tasks](#).

#4

In order to acquire performance data from a temporary performance information file during record collection, collection of the records collected when the `Std_Category`, `Cpu_Category`, `Memory_Category`, `Disk_Category`, and `Network_Category` items are enabled takes precedence over other records.

If records collected when any of these items are enabled are unnecessary, disable the relevant items by setting `N`. Doing so reduces the number of times the monitoring target is accessed. Remember that if you set `N` for any of the above items, you can no longer collect performance data for the relevant records.

For example, if you set `Std_Category` to `N` (disable collection), behavior for PI records is as follows:

- PI records are not saved in the Store database.
- A KAVJS5002-I error message is displayed when an attempt is made to display a real-time report on PI records from PFM - Web Console.
- If an alarm that uses a PI record is bound, the alarm does not function.

For the general procedure for performance data collection tasks, see [1.3.1 General procedure for performance data collection tasks](#).

#5

When you set a PFM - RM host account, see [2.5.2 For Hyper-V](#).

If PFM - RM for Virtual Machine is used in a cluster system, set the same user name and password on both the executing and standby nodes so that the PFM - RM host account can access both nodes.

#6

PFM - RM for Virtual Machine uses the user account specified by `HostUserID` to start the collection process. If the profile for the user account does not exist, acquisition of performance data might fail.

The profile information for a user account is created at the first logon with the user account.

When you add or change a PFM - RM for Virtual Machine instance environment, you might want to create a new user account and specify it for `HostUserID`. In such a case, the profile for the user account might have not been created yet. To avoid this, immediately after creating a new user account, log on to Windows with that user account.

#7

For collected log data, a maximum of eight files are created per monitoring target. If the hard disk does not have sufficient free space, a collected log output error will occur. For details about the collected log, see [7.3 Log information](#).

#8

The `VM Status (PI_VI)` record is the only record that is collected if this item is enabled. For details about the fields of this record, see [VM Status \(PI\\_VI\)](#) in [5. Records](#).

To check the CPU resource usage of the physical host itself that runs the virtual machine by using the clock frequency of the physical CPU as the CPU resource clock frequency, specify `N`. You can specify `N` if, for example, you want to move or stop a virtual machine without exhausting CPU resources.

To check the CPU resource usage of a virtual machine by using the clock frequency assigned to the virtual machine as the CPU resource clock frequency, specify `Y`. You can specify `Y` when there are sufficient CPU resources on the physical host that runs the virtual machine.

## Important note

Even if the setting for the connection environment specified in the instance environment is invalid, the instance environment generation command terminates normally. However, when you begin collecting records in that instance environment, no performance data is collected. For the corrective action to take in such a case, see [7.2.5\(3\) No performance data is collected even when PFM - RM for Virtual Machine is started](#).

The items that need to be specified during instance environment setup depend on the virtual environment to be monitored. The table below shows the items that need to be specified for each virtual environment.

Table 2–6: Instance information items to be specified for each virtual environment

Item	Virtual environment		
	VMware	Hyper-V	KVM
VM_Type	N	Y	Y
Interval	D	D	D
Std_Category	D	D	D
Cpu_Category	D	D	D
Memory_Category	D	D	D
Disk_Category	D	D	D
Network_Category	D	D	D
HostUserID	Y	Y	Y
HostPassword	Y	Y	Y
HostDomain	D	D	D
SSH_Client	N	N	Y
Log_Size	D	D	D
UseVcpuMax	D	N	N

### Legend:

Y: Specification is required.

D: Specify only to change the default value.

N: Specification is not necessary.

To create an instance environment, use the `jpccconf inst setup` command. The procedure for configuring an instance environment is described below. For an instance environment setting example, see [2.6 Examples of setting up an instance environment and monitoring targets](#).

To configure an instance environment:

1. Execute the `jpccconf inst setup` command.

You can specify any instance name. Make sure that you specify an easy-to-identify PFM - RM for the Virtual Machine instance name for convenience of management. The following shows an example of the command that builds an instance named `inst1`:

```
jpccconf inst setup -key RMVM -inst inst1
(jpcinssetup agt8 -inst inst1)
```

Note that the instance name you specify must consist of only single-byte alphanumeric characters. For details, see the manual *Job Management Partner 1/Performance Management Reference*.

For details about the `jpcconf inst setup` command, see the chapter that explains commands in the manual *Job Management Partner 1/Performance Management Reference*.

## 2. Set up the instance information of PFM - RM for Virtual Machine.

Enter the items listed in Table 2-5 as instructed by the command. All items are required. If you choose to use the default value that is displayed for an item to input, simply press the **Enter** key.

Once all of the information has been input, an instance environment is created. To change the instance information that was input during configuration, execute the `jpcconf inst setup` command again to update the instance environment. For details about how to update an instance environment, see [2.4.2 Updating an instance environment](#). You can change some of the information that was specified by editing the properties from PFM - Web Console. For details about the information that can be specified, see [E.2 Remote Monitor Collector service property list](#).

The instance environment that is created is described below.

- Folder structure of the instance environment

The instance environment is created under the following folder:

For a physical host: *installation-folder*\agt8

For a logical host: *environment-folder*#\jp1pc\agt8

#

The environment folder is the folder on a shared disk that was specified during creation of the logical host.

The table below shows the folder configuration of the instance environment that is created.

**Table 2–7: Folder configuration of the instance environment**

Folder name, file name			Explanation
Remote Monitor	<i>instance-name</i>	groups	Storage folder for group agents
		log	Storage folder for log files
		targets	Storage folder for remote agents
		GARULES.DAT	Grouping rule file
		grouplist.ini	Group list file
		inssetup.bat	Expansion of the <code>jpcconf inst setup</code> command for PFM - RM for Virtual Machine
		jpcagt.ini	Remote Monitor Collector service startup initialization file
		jpcagt.ini.lock	Lock file for a remote monitor collector service startup initialization file (this file is created for each instance)
		jpcagt.ini.model#	Model file for the Remote Monitor Collector service startup initialization file
		plugin.ini	Virtual environment connection definition file
		status.dat	Intermediate file for internal processing
		targetlist.ini	Monitoring-target list file
		tstatus.dat	Virtual-agent status information file
store	<i>instance-name</i>	backup	Backup folder

Folder name, file name			Explanation
store	instance-name	dump	Export folder
		import	Import folder
		log	Storage folder for log files
		partial	Partial backup folder
		*.DAT	Data model definition file
		*.DB	Performance data file
		*.IDX	Index file for a performance data file
		*.LCK	Lock file for a performance data file
		jpcsto.ini	Remote Monitor Store service startup initialization file
		jpcsto.ini.model <sup>#</sup>	Model file for the Remote Monitor Store service startup initialization file
		status.dat	Intermediate file for internal processing

#

Use this file when you need to restore the instance environment to the settings that were in effect when it was created.

- Service ID of the instance environment

The service ID of the instance environment is as follows.

*When the product name display function is enabled*

`instance-name [host-name] <RM VirtualMachine>`

*When the product name display function is disabled*

`8 function-ID instance-number instance-name [host-name]`

For PFM - RM for Virtual Machine, the instance name specified by the `jpcconf inst setup` command is displayed for the instance name. For details about service IDs, see the naming rules described in the appendix section of the *Job Management Partner 1/Performance Management Planning and Configuration Guide*. For details about the product name display function, see the chapter that explains the functions of Performance Management in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

- Windows service name of the instance environment

The Windows service name of the instance environment is as follows.

- Remote Monitor Collector service: PFM - RM *for Virtual Machine*-instance-name [logical-host-name]
- Remote Monitor Store service: PFM - RM *Store for Virtual Machine*-instance-name [logical-host-name]

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

For details about the Windows service name when Performance Management is operated on a logical host, see the chapter that explains configuration and operations in a cluster system in the *Job Management Partner 1/Performance Management User's Guide*.

## (4) Setting up monitoring targets VMware, Hyper-V, KVM

Set information about the monitoring-target virtual environments for the instance set up in (3) *Setting up an instance environment* above. You can set a maximum of 50 monitoring-target virtual environments. To set multiple monitoring-target virtual environments for one instance, repeat the procedure described in (3). Note, however, that if there are many monitoring-target virtual environments, performance might be reduced, depending on the performance and environment

of the machine. If this is the case, reduce the number of monitoring-target virtual environments. We recommend that you perform sufficient testing before you start working in the production environment.

Note on setting up a monitoring-target host:

- The command that generates a monitoring target terminates normally even if incorrect values are specified during setup of the monitoring-target host. However, record collection will not collect performance data if the settings are incorrect. For corrective measures you can take in such a case, see [7.2.5\(3\) No performance data is collected even when PFM - RM for Virtual Machine is started](#).

Setup of a monitoring target is performed on the PFM - RM for Virtual Machine host.

The table below lists and describes the items that can be specified during setup of a monitoring target. Check the settings of these items before starting operation.

**Table 2–8: Items that can be specified during setup of a PFM - RM for Virtual Machine monitoring target**

Item <sup>#1</sup>	Explanation	Specifiable value	Default	Whether re-updating by the jpccconf target setup command is possible
Target Host	Specifies the host name of a monitoring-target physical server. Make sure that the host name can resolve to an IP address. <sup>#2</sup> The specified value is used for collection of performance information and for health checks. For linkage with JP1/IM or NNM, the specified value is also used as the event host name.	A character string that is 32 bytes long and consists of only single-byte alphanumeric characters and hyphens (–) can be specified. However, a value that begins with a hyphen (–) cannot be specified. Make sure that you specify a value that is unique within the instance. <sup>#3</sup>	(None)	Y
VM_Host	Specifies the host name of a monitoring-target physical server. <sup>#2</sup> Specify this item if the destination host has already been created with a name that cannot be specified for Target Host. The specified value is used for collection of performance information. If no value is specified for this item, the value specified by Target Host is used to perform collection of performance information.	Character string not exceeding 256 bytes. Note that the following character cannot be used: <ul style="list-style-type: none"> <li>• Tab character</li> </ul>	(None)	Y
Security	Specifies whether to use SSL for communication with the monitoring-target physical server.	{0 1} <sup>#4</sup> 0: SSL is not used. 1: SSL is used. SSL is unavailable with Hyper-V or KVM. If 1 is specified in such a	1	Y



Item# <sup>1</sup>	Explanation	Specifiable value	Default	Whether re-updating by the jpccconf target setup command is possible
Security	Specifies whether to use SSL for communication with the monitoring-target physical server.	case, the system assumes that 0 is specified.	1	Y
Port	Specifies the port number that is used for communication with the monitoring-target physical server.	0-65535 For VMware: If 0 is specified, the port number that will be used differs depending on the Security value: <ul style="list-style-type: none"> <li>Security = 0 (do not use SSL) 80 (HTTP default port number)</li> <li>Security = 1 (use SSL) 443 (HTTPS default port number)</li> </ul> For KVM: If 0 is specified, 22 (SSH default port number) will be assumed.	0	Y
UserID	Specifies the user ID that is used to connect to the monitoring-target physical server. <sup>#5, #6</sup>	Character string not exceeding 256 bytes. Note that the following character cannot be used: <ul style="list-style-type: none"> <li>Tab character</li> </ul>	(None)	Y
Password	Specifies the password that is used to connect to the monitoring-target physical server. The character string entered for this item is not displayed. This item requires you to enter a value twice. If the monitoring target uses VMware and you specify a password that includes special characters, make sure that you specify a sanitized string.	Character string not exceeding 256 bytes. <sup>#7</sup> Note that the following character cannot be used: <ul style="list-style-type: none"> <li>Tab character</li> </ul>	(None)	Y
Domain	Specifies the name of the domain that the monitoring-target physical server belongs to. If the server belongs to a work group, you do not need to specify this item. If the monitoring target uses VMware or KVM, you do not need to specify this item.	Character string not exceeding 256 bytes. Note that the following character cannot be used: <ul style="list-style-type: none"> <li>Tab character</li> </ul>	(None)	Y



Item# <sup>1</sup>	Explanation	Specifiable value	Default	Whether re-updating by the jpcconf target setup command is possible
Private_Key_File	<p>Specifies the absolute path name of the private key file that is used for SSH public key encryption.</p> <p>Specify the path name of the private key file created by the procedure described in <a href="#">2.5.3 For KVM</a>.</p> <p>You do not need to enclose the path name in double quotation marks (") even if it includes spaces.<sup>#8</sup></p>	<p>Character string not exceeding 256 bytes.</p> <p>Note that the following character cannot be used:</p> <ul style="list-style-type: none"> <li>• Tab character</li> </ul>	(None)	Y

Legend:

Y: Re-updating is possible.

#1

If the `jpcconf target setup` command is executed in non-interactive mode, use this item name as the product-specific label in the definition file. For details about executing the command in non-interactive mode, see the chapter on commands in the manual *Job Management Partner 1/Performance Management Reference*.

#2

The first thing you must do before you can perform collection of performance information and do health checks is to ensure that the PFM - RM host name can resolve to an IP address. To use the JP1/IM linkage facility, the JP1/IM host name must be resolvable to an IP address. To use the OpenView linkage facility, the PFM - Manager and NNM host names must be resolvable to IP addresses.

#3

The string `All`, which is a reserved word for group agents, cannot be used.

#4

To set `Security` to 1, use of HTTPS must be permitted for `/sdk` on the VMware ESX side. To set `Security` to 0, use of HTTP must be permitted for `/sdk` on the VMware ESX side. For details about the setting procedure, see the VMware documentation that is appropriate for the version:

- VMware ESX 4.0  
*ESX Configuration Guide*  
*Change Security Settings for a Web Proxy Service*
- VMware ESX 4.1  
*ESX Configuration Guide*  
*Change Security Settings for a Web Proxy Service*
- VMware ESX 5  
**vSphere Security** on the vSphere 5 Documentation Center webpage  
*Change Security Settings for a Web Proxy Service*

#5

If the monitoring-target virtual environment uses VMware, the account you specify must have a *Read-only* or a higher VMware role. For details about how to specify the role settings, see the VMware documentation.

If the monitoring-target virtual environment uses Hyper-V, for the permission of the account you specify, see [2.5.2 For Hyper-V](#).

If the monitoring-target virtual environment uses KVM, always log in as superuser. For details about how to specify settings after login and notes, see [2.5.3 For KVM](#).

#6

If the monitoring-target virtual environment uses KVM, use `bash`, `bsh`, or `ksh` as the login shell for the user you specify.

#7

If the monitoring-target virtual environment uses VMware and any of the symbols listed in the following table are used in the password on the VMware side, replace them with symbol entities when specifying a value for `Password`.

Symbol	Symbol entity
<	&lt;
>	&gt;
&	&amp;
'	&apos;
"	&quot;

For example, if the string you want to specify for `Password` is `abc<def>xyz`, enter `abc&lt;def&gt;xyz`.

#8

The private key file is accessed every time record collection is performed. Make sure that the private key file at the path you specify can be accessed during record collection.

The items that must be specified during setup of a monitoring target differ depending on the monitoring-target virtual environment. The following table shows the required setting items for each virtual environment.

Table 2–9: Required setting items for each virtual environment

Item	Virtual environment		
	VMware	Hyper-V	KVM
Target Host	Y	Y	Y
VM_Host	D	D	D
Security	D	N	N
Port	D	N	D
UserID	Y	Y	Y
Password	Y	Y	N
Domain	N	Y	N
Private_Key_File	N	N	Y

Legend:

Y: Specification is required.

D: Specify only to change the default value.

N: Specification is not necessary.

A monitoring target is set up by using the `jpcconf target setup` command. To set up a monitoring target:

1. Execute the `jpcconf target setup` command.

For PFM - RM for Virtual Machine, we recommend that you specify the host name of the physical server as the monitoring target name.

The following shows an example of executing a command when setting the host named `targethost1` as the monitoring target of the instance named `inst1`.

```
jpcconf target setup -key RMVM -inst inst1 -target targethost1
```

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

- 2. Set up the PFM - RM for Virtual Machine monitoring target.  
Specify settings of the monitoring target as the command instructs. For details about these settings, see Table 2-8. After specifying a value for a setting item, press the return key to set the value. If you accept the initial value as is, only press the return key.

The following shows an example of specifying settings when the monitoring target is a VMware environment.

Conditions of the monitoring target that you want to set up:

- Host name of the physical server: `targethost1`
- User: `user1`
- Password: `pass1`
- Domain: `domain1`

```
C:\Program Files\Hitachi\jplpc\tools>jpcconf target setup -key RMVM -inst
inst1 -target targethost1
Target Host [] : targethost1 <Enter>
VM_Host [] : <Enter>
Security [1] : <Enter>
Port [0] :<Enter>
UserID:user1 <Enter>
Password :pass1#1<Enter>
Re-enter :pass1#1<Enter>
Domain [] :<Enter>
Private_Key_File [] :<Enter>
KAVE05361-I The monitoring target is now being added.
(servicekey#2=RMVM,inst=inst1, target=targethost1)
KAVE05362-I The monitoring target has been added.
(servicekey#2=RMVM,inst=inst1, target=targethost1)
```

#1  
You are prompted to enter a password twice. The string entered as the password is not displayed.

#2  
If the product name display function of PFM - Manager is disabled, `agt8` is displayed for `servicekey`.

After you have specified all settings, the monitoring-target environment is set up. The following table shows the folders created in the environment.

Table 2–10: Folders created in the monitoring-target environment

No.	Folder	File name	Description
1	<i>PFM-RM-for-Virtual-Machine-installation-folder#\agt8\agent\instance-name\targets</i>	<i>monitoring-target-name.ini</i>	Monitoring-target settings file
2		<i>monitoring-target-name.ini.model</i>	Model file for the monitoring-target settings file
3	<i>PFM-RM-for-Virtual-Machine-installation-folder#\agt8\agent\instance-name\targets\monitoring-target-name</i>	--	Work folder for the monitoring target

Legend:

--: Not applicable

#

If you use PFM - RM for Virtual Machine on a logical host, replace *PFM-RM-for-Virtual-Machine-installation-folder* with the *environment-folder\jplpc*.

Note that a service ID is added during setup of the monitoring target.

Added service ID:

- Remote Agent service

8Aab[*monitoring-target-name@host-name*] (*a*: instance-number, *b*: instance-name)

For *b* (*instance-name*) and *monitoring-target-name*, specify the corresponding values that are specified in the `jpcconf target setup` command.

For example, if the PFM - RM host name is `host1`, the instance name is `inst1`, and the monitoring target name is `targethost1`, the service ID is as follows:

8A1inst1[targethost1@host1]

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

To change the information about a monitoring target, re-execute the `jpcconf target setup` command. For details about updating a monitoring target, see [2.4.3 Updating monitoring targets](#).

Some of the items that are set can be changed by editing the properties of PFM - Web Console. For details about the items that can be changed by editing these properties, see [E.3 Remote agent and group agent property list](#).

## (5) Embedding a certificate VMware Optional

Before you use SSL to communicate with VMware, you must embed a certificate. For details, see [2.5.1 For VMware](#).

### Important note

If no certificate has been embedded when you use SSL to communicate with VMware, the following problems may occur:

- During performance data collection, it may take quite a while to receive a response from the VMware at the connection destination.

- Because of the delay in receiving a response from the VMware at the connection destination, performance data collection might not be completed within the prescribed collection interval, resulting in a collection failure.
- An error occurs when you perform an operation from PFM - Web Console that generates a query to the Remote Monitor Collector service of PFM - RM for Virtual Machine, such as display of service properties.
- The error KAVL16205-W occurs many times.

## (6) Network settings VMware, Hyper-V, KVM Optional

This is necessary only when you want to change the settings according to the network configuration in which Performance Management is used.

In the network settings, you can specify the following two items:

- IP address  
Set an IP address when you use Performance Management in a network that is connected to multiple LANs. To set multiple IP addresses, define host names and IP addresses in the `jpchosts` file. Use the same `jpchosts` file throughout the entire Performance Management system.  
For details about how to set IP addresses, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.
- Port number  
You can set the port number to be used by Performance Management. To avoid confusion during operations, use the same port number and service name throughout the entire Performance Management system.  
For details about how to set port numbers, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

## (7) Changing the log file size VMware, Hyper-V, KVM Optional

The operation status of Performance Management is output to a log file specific to Performance Management. This log file is called the *common message log*. By default, the common message log uses two files, each with 2,048 kilobytes. This setting is necessary only when you want to change the size of this file.

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

## (8) Changing the performance data storage destination VMware, Hyper-V, KVM

Optional

This setting is necessary only when you want to change the folder at the save destination, the backup destination, or the export destination for the database that stores the performance data managed by PFM - RM for Virtual Machine.

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

- Save destination: `installation-folder\agt8\store\instance-name\`
- Backup destination: `installation-folder\agt8\store\instance-name\backup\`
- Partial backup destination: `installation-folder\agt8\store\instance-name\partial\`
- Export destination: `installation-folder\agt8\store\instance-name\dump\`
- Import destination: `installation-folder\agt8\store\instance-name\import\`

### Important note

For the default save destinations when Performance Management is operated on a logical host, replace *installation-folder* with *environment-folder\jplpc*.

For details, see [2.4.1 Changing the performance data storage destination](#).

## (9) Setting up PFM - Manager at the connection destination of PFM - RM for Virtual Machine VMware, Hyper-V, KVM

On the host on which PFM - RM for Virtual Machine is installed, set up the PFM - Manager that manages the PFM - RM for Virtual Machine. To set up PFM - Manager at the connection destination, use the `jpcconf mgrhost define` command.

### Important note

- Even when multiple PFM - RMs are installed on the same host, you can specify only one PFM - Manager at the connection destination. You cannot set up a different PFM - Manager for each PFM - RM.
- When PFM - RM for Virtual Machine and PFM - Manager are installed on the same host, the PFM - Manager of the local host becomes the PFM - Manager at the connection destination. In this case, you cannot change the PFM - Manager at the connection destination to another PFM - Manager.

To set up PFM - Manager at the connection destination:

#### 1. Stop Performance Management programs and services.

Before you perform a setup operation, if Performance Management programs and services have been activated on the local host, stop all of them. For details about how to stop services, see the chapter that explains startup and termination of Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

If the Performance Management programs and services are active during the execution of the `jpcconf mgrhost define` command, a message asking the user whether to stop these programs and services is displayed.

#### 2. Specify the host name of the PFM - Manager host at the connection destination, and then execute the `jpcconf mgrhost define` command.

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

```
jpcconf mgrhost define -host host01
(jpcnshostname -s host01)
```

## (10) Setting the action log output VMware, Hyper-V, KVM

Optional

This setting is necessary if you want to output an action log when you start or stop a PFM service, or when you change the connection status with PFM - Manager. An *action log* contains history information that is output in conjunction with the alarm function that monitors items such as the system load threshold.

For details about the setting procedure, see [I. Outputting Action Log Data](#).

## (11) Set up WMI Hyper-V

For details about the WMI settings, see [2.5.2 For Hyper-V](#).

## (12) Specifying the SSH connection settings KVM

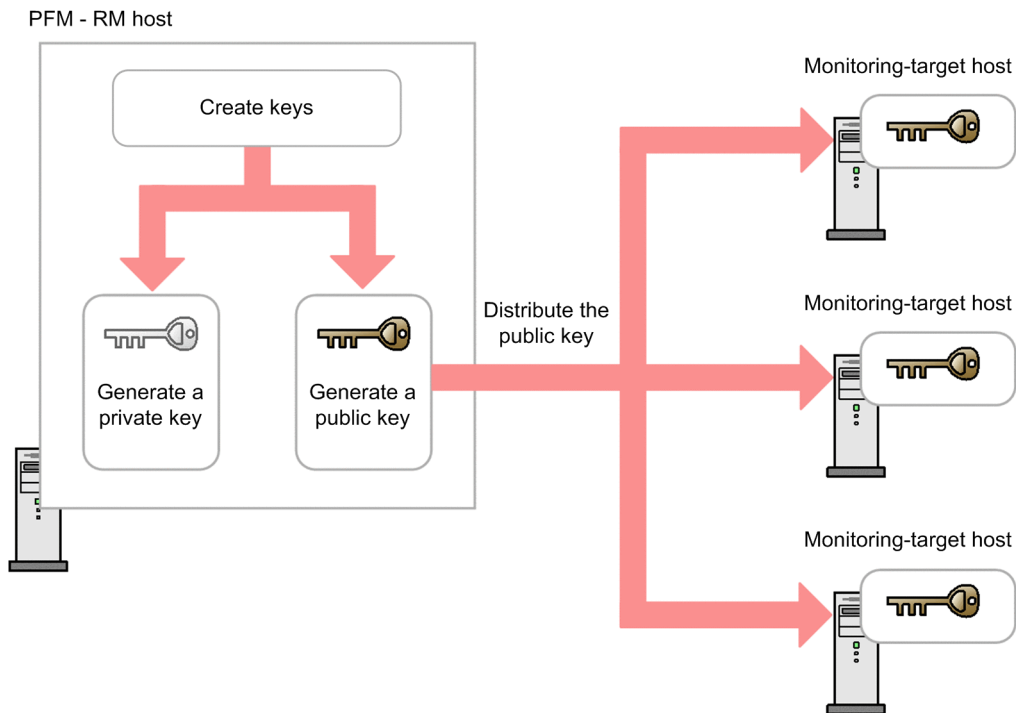
If the monitoring-target host uses KVM, the host must be connected to an SSH server in order to collect performance data from the host. This subsection describes how to specify the SSH connection settings. Note that the SSH server is authenticated by public key authentication.

To enable connection to an SSH server, the following operations must be performed:

- Enable public key authentication of the SSH server.  
Do this on the monitoring-target host.
- Create keys.  
Do this on the PFM - RM host.
- Deploy the private key on the PFM - RM host.  
Do this on the PFM - RM host.
- Deploy the public key on the monitoring-target host.  
Do this on the monitoring-target host.

The following figure shows the concept of public key authentication.

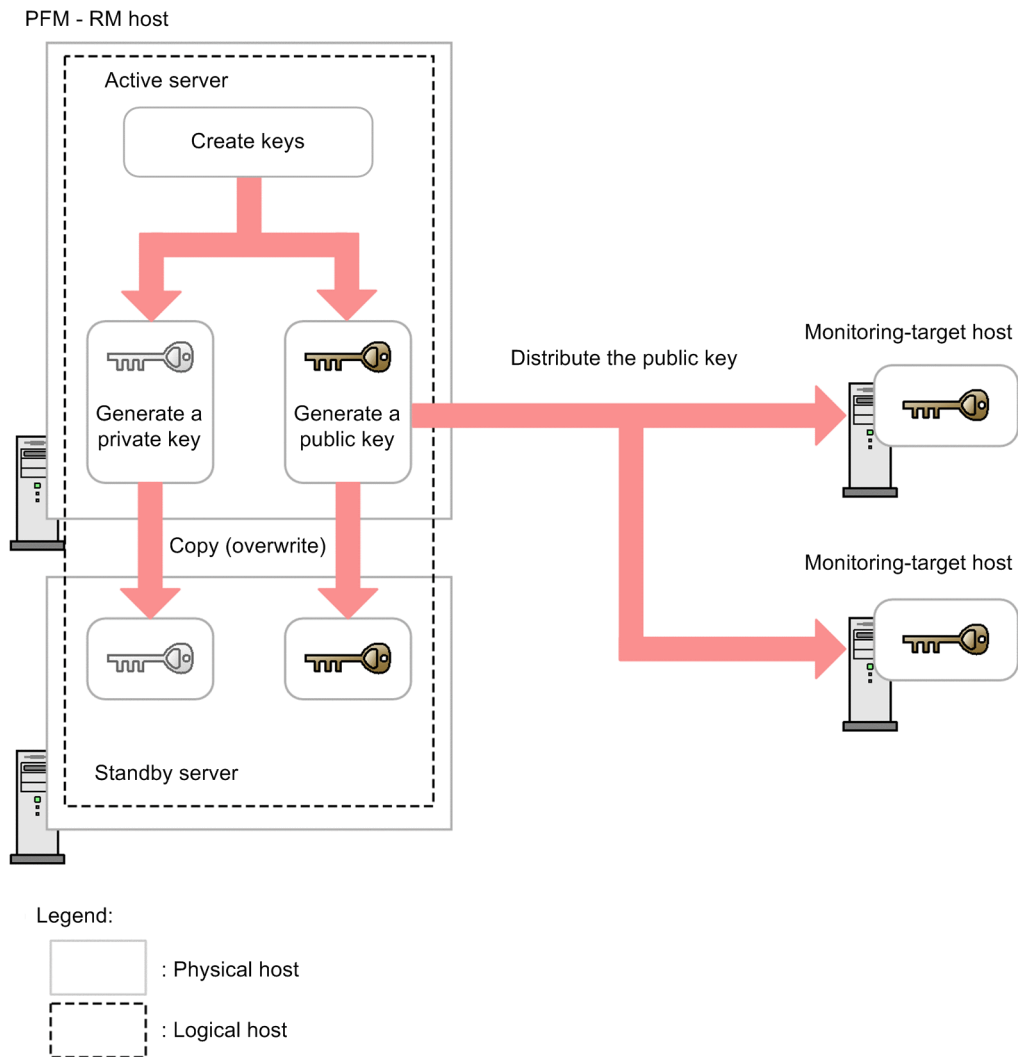
Figure 2–6: Concept of public key authentication



In a cluster system, there are two methods of public key authentication. One method uses the same keys for the executing and standby nodes, and the other method uses different keys for those nodes.

If you choose to use the same keys for both the executing and standby nodes, copy the key files on the executing node to the standby node, overwriting the existing key files on the standby node. The following figure shows public key authentication using the same keys for both nodes.

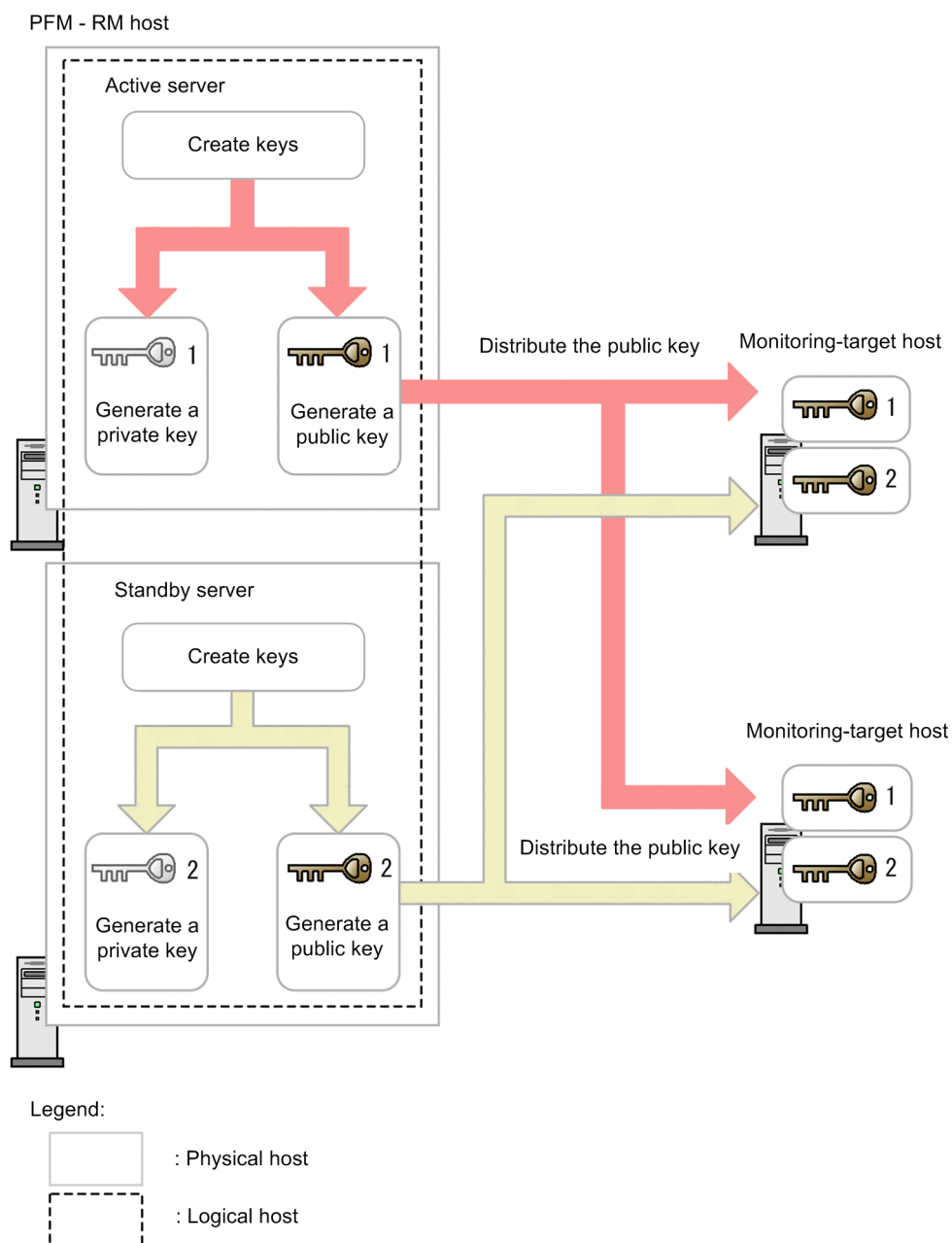
Figure 2–7: Public key authentication using the same keys for both the executing and standby nodes



If you choose to use different keys for the executing and standby nodes, register the keys on the monitoring-target host. The following figure shows public key authentication using different keys for the executing and standby nodes.



Figure 2–8: Public key authentication using different keys for the executing and standby nodes



For details about SSH settings, see [2.5.3 For KVM](#).

## 2.2 Uninstallation and unsetup

---

This section explains how to uninstall and unsetup PFM - RM for Virtual Machine.

### 2.2.1 Before uninstallation and unsetup

Note the following points before you perform uninstallation and unsetup of PFM - RM for Virtual Machine.

#### (1) Note about the OS user permissions required for uninstallation

- To uninstall PFM - RM for Virtual Machine, you must perform the procedure as a user with Administrator permissions.

#### (2) Note about the network

- Even when you uninstall Performance Management programs, the port numbers defined in the `services` file are not deleted.

#### (3) Notes about programs

- If you uninstall a Performance Management program while another program (e.g., Windows Event Viewer) that references a Performance Management program, service, or file is running, files or folders might remain. In this case, manually delete all the files and folders under the installation folder.
- If you uninstall a Performance Management program while another program (e.g., Windows Event Viewer) that references a Performance Management program, service, or file is running, a message asking the user to restart the system may be displayed. In this case, restart the system as instructed by the message, and then complete the uninstallation process.
- If both PFM - Base and PFM - RM for Virtual Machine have been installed on a host, you must first uninstall PFM - RM for Virtual Machine before you can uninstall PFM - Base. In this case, uninstall PFM - RM for Virtual Machine first, followed by PFM - Base. Likewise, if both PFM - Manager and PFM - RM for Virtual Machine have been installed on a host, you must first uninstall PFM - RM for Virtual Machine before you can uninstall PFM - Manager. In this case, uninstall PFM - RM for Virtual Machine first, followed by PFM - Manager.

#### (4) Note about services

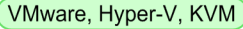
Uninstalling PFM - RM for Virtual Machine alone does not delete the service information that can be displayed using the `jpctool service list` command. In this case, use the `jpctool service delete` command to delete the service information. To get the PFM - Web Console host to recognize that an instance environment has been deleted, execute the `jpctool service sync` command. This synchronizes the agent information on the PFM - Manager host and the PFM - Web Console host.

For details, see the section about deleting services in the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

#### (5) Other notes

- To uninstall Performance Management programs from a host on which PFM - Web Console has been installed, close all browser windows before you perform uninstallation.

## 2.2.2 Unsetup procedure

This subsection explains how to unset up PFM - RM for Virtual Machine. The unsetup procedure depends on the virtual environment to be monitored. The icon  indicates an unsetup item required for the indicated virtual environment.

### (1) Deleting a monitoring target

To delete a monitoring target, you need to first confirm the name of the monitoring target and then delete the monitoring target on the PFM - RM host. To confirm the name of the monitoring target that you want to delete, use the `jpccnf target list` command. To delete the monitoring target, use the `jpccnf target unsetup` command.

You do not need to stop the PFM - RM for Virtual Machine service when deleting a monitoring target.

To delete a monitoring target:

1. Check the name of the monitoring target that you want to delete.

Execute the `jpccnf target list` command by specifying the service key and the instance name that identify the target PFM - RM for Virtual Machine instance.

```
jpccnf target list -key RMVM -inst inst1
```

The names of hosts monitored by the instance are displayed.

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

2. Delete the objective monitoring target.

Execute the `jpccnf target unsetup` command by specifying the service key, instance name, and monitoring target name that identify the target PFM - RM for Virtual Machine instance.

```
jpccnf target unsetup -key RMVM -inst inst1 -target targethost1
```

When the `jpccnf target unset` command terminates normally, `targethost1` is no longer monitored.

Notes:

- If you use the `jpccnf target unsetup` command to delete a monitoring target, service information is automatically deleted from PFM - Manager. Therefore, you do not need to execute the `jpctool service delete` command. The following describes when service information is deleted.
  - If the `jpccnf target unsetup` command is executed while the services of PFM - Manager and the target PFM - RM for Virtual Machine instance are running, the instance requests PFM - Manager to delete service information. Service information is deleted at this time.
  - If the `jpccnf target unsetup` command is executed while the service of PFM - Manager or the target PFM - RM for Virtual Machine instance is not running, service information is deleted at the following time: when the service of PFM - RM for Virtual Machine is restarted and connected to PFM - Manager.
- For the PFM - Web Console host to recognize that an instance environment has been deleted, execute the `jpctool service sync` command to synchronize the agent information on the PFM - Manager host and the PFM - Web Console host.

Note that the folder and files shown below are not deleted when a monitoring target is deleted. Delete these folder and files manually.

*installation-folder*#\agt8\agent\instance-name\targets\monitoring-target-name

*installation-folder*#\agt8\agent\instance-name\log\VM\_Type\_monitoring-target-nameN

#

If you use PFM - RM for Virtual Machine on a logical host, replace *installation-folder* with the *environment-folder*\jp1pc.

## (2) Unsetup of the instance environment VMware Hyper-V

To unset up the instance environment, first confirm the instance name and then delete the instance environment. Delete the instance environment from the PFM - RM host. To confirm the instance name, use the `jpccconf inst list` command. In addition, to delete an instance environment that has been created, use the `jpccconf inst unsetup` command.

To delete an instance environment:

1. Confirm the instance name.

Specify the service key indicating PFM - RM for Virtual Machine and then execute the `jpccconf inst list` command.

```
jpccconf inst list -key RMVM
(jpcinslist agt8)
```

If the instance name that was set is `inst1`, `inst1` is displayed.

2. If any PFM - RM for Virtual Machine services in the instance environment are active, stop them.

For details about how to stop services, see the chapter that explains startup and termination of Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

3. Delete the instance environment.

Specify the service key indicating the PFM - RM for Virtual Machine and the instance name, and then execute the `jpccconf inst unsetup` command. If the instance name that was set is `inst1`, specify the following:

```
jpccconf inst unsetup -key RMVM -inst inst1
(jpcinsunsetup agt8 -inst inst1)
```

When the `jpccconf inst unsetup` command terminates normally, the folders, service IDs, and Windows services that were created as the instance environment are deleted.

### Important note

Even when you unset up the instance environment, the service information that can be displayed using the `jpctool service list` command is not deleted. You use the `jpctool service delete` command to delete the service information.

To get the PFM - Web Console host to recognize that an instance environment has been deleted, execute the `jpctool service sync` command. This synchronizes the agent information on the PFM - Manager host and the PFM - Web Console host.

A specification example follows.

- Instance name: `inst1`
  - Host name: `host03`
  - Remote Monitor Collector service service ID: `8A1inst1[host03]`
  - Remote Monitor Store service service ID: `8S1inst1[host03]`
  - Group Agent service service ID: `8Ainst1[All@host03]`
- ```

jpctool service delete -id 8?1inst1[host03] -host host03
jpctool service delete -id 8?1inst1[*@host03] -host host03
(jpcctrl delete 8?1inst1[host03] host=host03)

```

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

### (3) Deleting settings from PFM - Manager VMware, Hyper-V, KVM

From PFM - Web Console, log into PFM - Manager and delete the definitions related to the PFM - RM for Virtual Machine instance that you want to unset up.

To delete settings from PFM - Manager:

1. Delete the agent from PFM - Web Console.

2. Delete the agent information of PFM - Manager.

For example, to delete the service information of the PFM - RM for Virtual Machine instance of the host `targethost1`, specify the following and execute the command:

```

jpctool service delete -id service-ID -host targethost1
(jpcctrl delete service-ID host=targethost1)

```

For *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 that explains startup and termination of Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

4. Restart PFM - Web Console.

So that the deletion of service information takes effect on PFM - Web Console, first restart the PFM - Manager service, followed by PFM - Web Console.

## 2.2.3 Uninstallation procedure

This subsection explains how to uninstall PFM - RM for Virtual Machine.

To uninstall PFM - RM for Virtual Machine:

1. Log on to the host from which you want to uninstall PFM - RM for Virtual Machine as a user with Administrator permissions.
2. On the local host, stop Performance Management programs and services.  
Display the service information to make sure services are not running.

If any Performance Management programs and services are active on the local host, stop all of them. You must stop all services on both the physical host and on the logical hosts. For details about how to display services or stop services, see the chapter that explains startup and termination of Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

3. Select the Performance Management programs you want to uninstall.

From Windows **Control Panel**, choose **Add or Remove Programs**<sup>#</sup>, and select the Performance Management programs to uninstall.

<sup>#</sup>: The names might vary depending on the Windows version.

4. Choose **Remove** and click **OK**.

The selected programs are uninstalled.

*Note:*

The WMI connection settings might be changed ([2.1.4\(11\) Set up WMI](#)). If these settings have been changed, we recommend that you restore the initial settings.

The private key and public key that are used for SSH public key authentication might be set ([2.1.4\(12\) Specifying the SSH connection settings](#)). If these keys have been set but are not necessary, delete them. If PuTTY is unnecessary, uninstall it.

*Precautions regarding uninstallation in a Windows Server 2008 or a Windows Server 2012 environment*

If user account control functionality (UAC) is enabled on the operating system, 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 PFM - RM for Virtual Machine system configuration

---

If the network configuration of the monitored system or its host name changes, you may need to modify the system configuration of PFM - RM for Virtual Machine.

When you modify the system configuration of PFM - RM for Virtual Machine, you must also modify the settings of PFM - Manager and PFM - Web Console. For details about how to modify the system configuration of Performance Management, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*. Note that when you change the physical host name or alias name, some PFM - RMs may require specific additional tasks. However, in the case of PFM - RM for Virtual Machine, no specific additional tasks are required.

To change the setting for a running PFM - RM for Virtual Machine system, perform the procedure described in [2.1.4\(2\) Setting PFM - RM for Virtual Machine](#), and then restart all services in the changed instances environment. After restarting the services, the settings are updated.

Also, the performance data changes after the settings are changed, so you need to check the thresholds of the fields as described in [M. Fields Affected by Setting the PFM - RM for Virtual Machine](#).

## 2.4 Changing the PFM - RM for Virtual Machine operation method

If there are changes in the way the collected operation monitoring data is used, you may need to modify the PFM - RM for Virtual Machine operating procedures. For details about how to modify operating procedures for the entire Performance Management system, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

### 2.4.1 Changing the performance data storage destination

Performance data collected by PFM - RM for Virtual Machine is managed in the Store database of the Remote Monitor Store service of PFM - RM for Virtual Machine. This subsection explains how to change the performance data storage destination.

To change the data storage folders listed below that collect performance data managed in the Store database, use the `jpccconf db define` command to specify a new folder. If you need to save the performance data that was collected before the Store database storage folders were changed, use the `-move` option of the `jpccconf db define` command. For details about the `jpccconf db define` command, see the chapter that explains commands in the manual *Job Management Partner 1/Performance Management Reference*.

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

The table below describes the option names and the ranges of values that can be set in the `jpccconf db define` command.

Table 2–11: Items that can be set in the command for changing the performance data storage destination

| Explanation                                           | Option name | Value that can be set <sup>#1</sup> | Default value <sup>#2</sup>                                 |
|-------------------------------------------------------|-------------|-------------------------------------|-------------------------------------------------------------|
| Performance data creation folder                      | sd          | Path name of 1-214 bytes            | <i>installation-folder\agt8\store\instance-name</i>         |
| Performance data backup folder                        | bd          | Path name of 1-211 bytes            | <i>installation-folder\agt8\store\instance-name\backup</i>  |
| Performance data partial backup folder                | pbd         | Path name of 1-214 bytes            | <i>installation-folder\agt8\store\instance-name\partial</i> |
| Largest generation number for saving performance data | bs          | 1-9                                 | 5                                                           |
| Performance data export folder                        | dd          | Path name of 1-127 bytes            | <i>installation-folder\agt8\store\instance-name\dump</i>    |
| Performance data import folder                        | id          | Path name of 1-222 bytes            | <i>installation-folder\agt8\store\instance-name\import</i>  |



#1

Specify the folder name using a relative or absolute path from the default Store database storage folder (*installation-folder\agt8\store*).

#2

For the default values when Performance Management is operated on a logical host, replace *installation-folder* with *environment-folder\jplpc*.

## 2.4.2 Updating an instance environment

To update an instance environment, confirm the instance name and then update the instance information. You specify instance information from the PFM - RM host.

Use the following table to confirm the information you need to update.

Table 2–12: PFM - RM for Virtual Machine instance information

| Item             | Explanation                                                                                                                                             | Value that can be set                                                                                                                                       | Default value    |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| VM_Type          | Specifies the type of virtual environment to be monitored.                                                                                              | Cannot be changed                                                                                                                                           | Previous setting |
| Interval         | Specifies the collection process execution interval.                                                                                                    | 60 through 3,600 (units: seconds)                                                                                                                           | Previous setting |
| Std_Category     | Specifies whether the collection process outputs the basic information (PI, VI, and VM records) to a temporary performance information file.            | Either of the following values: <ul style="list-style-type: none"><li>• Y: Outputs the information.</li><li>• N: Does not output the information.</li></ul> | Previous setting |
| Cpu_Category     | Specifies whether the collection process outputs the CPU information (HCI and VCI records) to a temporary performance information file.                 | Either of the following values: <ul style="list-style-type: none"><li>• Y: Outputs the information.</li><li>• N: Does not output the information.</li></ul> | Previous setting |
| Memory_Category  | Specifies whether the collection process outputs the memory information (HMI and VMI records) to a temporary performance information file.              | Either of the following values: <ul style="list-style-type: none"><li>• Y: Outputs the information.</li><li>• N: Does not output the information.</li></ul> | Previous setting |
| Disk_Category    | Specifies whether the collection process outputs the disk information (HPDI, VPDI, HLDI, and VLDI records) to a temporary performance information file. | Either of the following values: <ul style="list-style-type: none"><li>• Y: Outputs the information.</li><li>• N: Does not output the information.</li></ul> | Previous setting |
| Network_Category | Specifies whether the collection process outputs the network information (HNI and VNI records) to a temporary performance information file.             | Either of the following values: <ul style="list-style-type: none"><li>• Y: Outputs the information.</li><li>• N: Does not output the information.</li></ul> | Previous setting |
| HostUserID       | Specifies the user ID of the PFM - RM host.                                                                                                             | Character string not exceeding 256 bytes. Note that the following character cannot be used: <ul style="list-style-type: none"><li>• Tab character</li></ul> | Previous setting |

| Item         | Explanation                                                                                                                                                                                                                                                                               | Value that can be set                                                                                                                                       | Default value    |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| HostPassword | Specifies the password for the user ID that was specified in HostUserID. The characters entered for this item are not displayed on the screen. When you enter a value for this item, the system will ask you to re-enter the value.                                                       | Character string not exceeding 256 bytes. Note that the following character cannot be used: <ul style="list-style-type: none"> <li>Tab character</li> </ul> | Previous setting |
| HostDomain   | Specifies the name of the domain that the PFM - RM host belongs to. This specification is unnecessary if the host belongs to a work group.                                                                                                                                                | Character string not exceeding 256 bytes. Note that the following character cannot be used: <ul style="list-style-type: none"> <li>Tab character</li> </ul> | Previous setting |
| SSH_Client   | Specifies the absolute path of the SSH client (PuTTY) execution module (plink.exe). You do not need to enclose the path name in double quotation marks (") even if it includes spaces.                                                                                                    | Character string not exceeding 256 bytes. Note that the following character cannot be used: <ul style="list-style-type: none"> <li>Tab character</li> </ul> | Previous setting |
| Log_Size     | Specifies the maximum size of a file for the collected log.                                                                                                                                                                                                                               | 1-32 (megabytes)<br>A value of 16 or greater is recommended.                                                                                                | Previous setting |
| UseVcpuMax   | Specifies which is to be used as the CPU resource clock frequency: the frequency assigned to the virtual machine or the clock frequency of the physical CPU. To use the frequency assigned to the virtual machine, specify Y.<br><br>To use the frequency of the physical CPU, specify N. | { Y   N }                                                                                                                                                   | Previous setting |

The items that need to be specified during instance environment setup depend on the virtual environment to be monitored. This also applies to the items that can be updated. The table below shows whether the items can be updated for each virtual environment.

**Table 2–13: Instance information items that can be updated for each virtual environment**

| Item             | Virtual environment |         |     |
|------------------|---------------------|---------|-----|
|                  | VMware              | Hyper-V | KVM |
| VM_Type          | N                   | N       | N   |
| Interval         | Y                   | Y       | Y   |
| Std_Category     | Y                   | Y       | Y   |
| Cpu_Category     | Y                   | Y       | Y   |
| Memory_Category  | Y                   | Y       | Y   |
| Disk_Category    | Y                   | Y       | Y   |
| Network_Category | Y                   | Y       | Y   |
| HostUserID       | Y                   | Y       | Y   |
| HostPassword     | Y                   | Y       | Y   |
| HostDomain       | Y                   | Y       | Y   |

| Item       | Virtual environment |         |     |
|------------|---------------------|---------|-----|
|            | VMware              | Hyper-V | KVM |
| SSH_Client | --                  | --      | Y   |
| Log_Size   | Y                   | Y       | Y   |
| UseVcpuMax | Y                   | --      | --  |

Legend:

Y: Can be updated

N: Cannot be updated

--: Updating is not necessary because the setting has no effect on the PFM - RM for Virtual Machine operation

To confirm an instance name, use the `jpccconf inst list` command. To update the instance environment, use the `jpccconf inst setup` command.

The procedure for updating the instance environment is as follows. To update multiple instance environments, repeat this procedure.

To update the instance environment:

1. Confirm the instance name.

Specify the service key indicating PFM - RM for Virtual Machine, and then execute the `jpccconf inst list` command.

```
jpccconf inst list -key RMVM
```

If the instance name that was set is `inst1`, `inst1` is displayed.

2. If any PFM - RM for Virtual Machine services are active for the instance environment you are updating, stop them.

For details about how to stop services, see the chapter that explains startup and termination of Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

If the instance environment you are updating is active when you try to execute the `jpccconf inst setup` command, a confirmation message is displayed and you can stop the service. If you stop the service, the updating process continues. If you do not stop the service, the updating process stops.

3. Specify both the service key indicating PFM - RM for Virtual Machine and the instance name, and then execute the `jpccconf inst setup` command.

To update an instance environment in which the instance name is `inst1`, specify the following and then execute the command:

```
jpccconf inst setup -key RMVM -inst inst1
```

4. Update the instance information of PFM - RM for Virtual Machine.

Enter the items listed in Table 2-12 as instructed by the command. The current settings are displayed. If you choose not to change the displayed value, simply press the **Enter** key. Once all information has been input, the instance environment is updated.

5. Restart the service(s) of the updated instance environment.

For details about how to start services, see the chapter that explains startup and termination of Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

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

## 2.4.3 Updating monitoring targets

To update a monitoring target, check the name of the monitoring target, and then update the information about the monitoring target. Set the new information about the monitoring target on the PFM - RM host.

The table below lists and describes the information items that can be updated. Check the items that you want to change beforehand.

Table 2–14: Setting items for a monitoring target of PFM - RM for Virtual Machine

| Item        | Explanation                                                                                                                                                                                                                                                                                                                                                                                             | Value that can be set                                                                                                                                                                                                                                                                                                   | Default value    |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| Target Host | Specifies the host name of a monitoring-target physical server. Make sure that the host name can resolve to an IP address. <sup>#1</sup><br>The specified value is used for collection of performance information and for health checks. For linkage with JP1/IM or NNM, the specified value is also used as the event host name.                                                                       | A character string that is 32 bytes long and consists of only single-byte alphanumeric characters and hyphens (–) can be specified.<br>However, a value that begins with a hyphen (–) cannot be specified.<br>Make sure that you specify a value that is unique within the instance. <sup>#2</sup>                      | Previous setting |
| VM_Host     | Specifies the host name of a monitoring-target physical server. Specify this item if the destination host has already been created with a name that cannot be specified for Target Host.<br>The specified value is used for collection of performance information. If no value is specified for this item, the value specified by Target Host is used to perform collection of performance information. | Character string not exceeding 256 bytes. Note that the following character cannot be used: <ul style="list-style-type: none"><li>• Tab character</li></ul>                                                                                                                                                             | Previous setting |
| Security    | Specifies whether to use SSL for communication with the monitoring-target physical server.                                                                                                                                                                                                                                                                                                              | { 0   1 } <ul style="list-style-type: none"><li>• 0: SSL is not used.</li><li>• SSL is used.</li></ul> SSL is unavailable with Hyper-V or KVM. If 1 is specified in such a case, the system assumes that 0 is specified.                                                                                                | Previous setting |
| Port        | Specifies the port number that is used for communication with the monitoring-target physical server.                                                                                                                                                                                                                                                                                                    | 0-65535 <ul style="list-style-type: none"><li>• For VMware:<br/>If 0 is specified, the port number that will be used differs depending on the Security value:<br/>Security = 0 (do not use SSL): 80 (HTTP default port number)<br/>Security = 1 (use SSL): 443 (HTTPS default port number)</li><li>• For KVM:</li></ul> | Previous setting |

| Item             | Explanation                                                                                                                                                                                                                                                                                                                                              | Value that can be set                                                                                                                                       | Default value    |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| Port             | Specifies the port number that is used for communication with the monitoring-target physical server.                                                                                                                                                                                                                                                     | If 0 is specified, 22 (SSH default port number) will be assumed.                                                                                            | Previous setting |
| UserID           | Specifies the user ID that is used to connect to the monitoring-target physical server. <sup>#3</sup>                                                                                                                                                                                                                                                    | Character string not exceeding 256 bytes. Note that the following character cannot be used: <ul style="list-style-type: none"> <li>Tab character</li> </ul> | Previous setting |
| Password         | Specifies the password that is used to connect to the monitoring-target physical server. The character string entered for this item is not displayed. This item requires you to enter a value twice.<br>If the monitoring target uses VMware and you specify a password that includes special characters, make sure that you specify a sanitized string. | Character string not exceeding 256 bytes. Note that the following character cannot be used: <ul style="list-style-type: none"> <li>Tab character</li> </ul> | Previous setting |
| Domain           | Specifies the name of the domain that the monitoring-target physical server belongs to.<br>If the server belongs to a work group, you do not need to specify this item.<br>If the monitoring target uses VMware or KVM, you do not need to specify this item.                                                                                            | Character string not exceeding 256 bytes. Note that the following character cannot be used: <ul style="list-style-type: none"> <li>Tab character</li> </ul> | Previous setting |
| Private_Key_File | Specifies the absolute path name of the private key file that is used for SSH public key encryption.<br>You do not need to enclose the path name in double quotation marks (") even if it includes spaces.                                                                                                                                               | Character string not exceeding 256 bytes. Note that the following character cannot be used: <ul style="list-style-type: none"> <li>Tab character</li> </ul> | Previous setting |

#### #1

The first thing you must do before you can perform collection of performance information and do health checks is to ensure that the PFM - RM host name can resolve to an IP address. To use the JP1/IM linkage facility, the JP1/IM host name must be resolvable to an IP address. To use the OpenView linkage facility, the PFM - Manager and NNM host names must be resolvable to IP addresses.

#### #2

The string All, which is a reserved word for group agents, cannot be used.

#### #3

If the monitoring-target virtual environment uses VMware, the account you specify must have a *Read-only* or a higher VMware role. For details about how to specify the role settings, see the VMware documentation.

For the permission required for the account to be specified if the monitoring-target virtual environment uses Hyper-V, see the notes in [2.5.2 For Hyper-V](#).

If the monitoring-target virtual environment uses KVM, always log in as superuser. For details about how to specify settings after login and notes, see [2.5.3 For KVM](#).

Note that the items that must be specified during setup of a monitoring target differ depending on the virtual environment. Therefore, the items that can be updated also differ depending on the virtual environment. The following table shows the updatable items for each virtual environment.

**Table 2–15: Updatable items of a monitoring target for each virtual environment**

| Item             | Virtual environment |         |     |
|------------------|---------------------|---------|-----|
|                  | VMware              | Hyper-V | KVM |
| Target Host      | Y                   | Y       | Y   |
| VM_Host          | Y                   | Y       | Y   |
| Security         | Y                   | --      | --  |
| Port             | Y                   | --      | Y   |
| UserID           | Y                   | Y       | Y   |
| Password         | Y                   | Y       | --  |
| Domain           | --                  | Y       | --  |
| Private_Key_File | --                  | --      | Y   |

Legend:

Y: Can be updated

--: Updating is not necessary because the setting has no effect on the PFM - RM for Virtual Machine operation

To check the name of the monitoring target that you want to update, use the `jpccconf target list` command. To update the monitoring target, use the `jpccconf target setup` command.

The following procedure shows how to update a monitoring target. To update multiple monitoring targets in an instance environment, repeat the procedure. To update a monitoring target:

1. Check the name of the monitoring target that you want to update.

To display the names of monitoring targets for instance `inst1`, execute the `jpccconf target list` command by specifying the service key that indicates PFM - RM for Virtual Machine.

```
jpccconf target list -key RMVM -inst inst1
```

If the only monitoring target that is set is `targethost1`, the command displays `targethost1`.

2. Execute the `jpccconf target setup` command by specifying the name of the monitoring target that you want to update, as well as the service key of PFM - RM for Virtual Machine and the instance name.

For example, to update monitoring target `targethost1` of instance `inst1`, execute the following command:

```
jpccconf target setup -key RMVM -inst inst1 -target targethost1
```

3. Update the information about the monitoring target of PFM - RM for Virtual Machine.

Specify values for the items indicated in Table 2-14. The current value is displayed for each item in the initial status. To accept the displayed value, just press the return key. When all entries are completed, the monitoring target is updated.

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

## 2.5 Settings for each virtual environment

This section describes the settings required for each virtual environment.

### 2.5.1 For VMware

When the virtual environment to be monitored is VMware, you can use SSL<sup>#1</sup> to encrypt communications between PFM - RM for Virtual Machine and the virtual environment. To use SSL for communication with a virtual environment, you need to set up the VMware with trusted certificate as following:

- A CA-signed certificate must be installed in VMware ESX.
- A CA certificate must be installed on the PFM - RM for Virtual Machine host.

This subsection describes the procedure for installing a trusted certificate. Note that this procedure must be performed for each monitoring target. If the host name of a monitoring target is changed, you must publish a new certificate and re-install it.

#1

The SSL communication protocol is using the Internet Options of the user account set for HostUserID in the instance environment settings.

If you change the settings, log in to the PFM - RM for Virtual Machine host by using the user account set for HostUserID in the instance environment settings, in the Internet Options dialog box, click the Advanced tab, and then change the settings in the Security category. If you do not use SSL 3.0, uncheck Use SSL 3.0 and check Use TLS 1.0, Use TLS 1.1, and Use TLS 1.2 in the Security category.

#### Important note

If you choose to use a default certificate of VMware ESX 4.0 or after that is not signed by a CA for operation, the following precautions need to be taken. Make sure that your environment is appropriate, given these precautions. You cannot use the default certificate of VMware ESX 4.0 or after as a trusted certificate, so you don't need the procedures (1) threw (3) describing below.

- For an environment that cannot communicate with the Windows Update site

The Update Root Certificates function works for communications that use a certificate. When the Update Root Certificates function verifies the certificate, the function does so by downloading the latest information from the Windows Update site. When the Update Root Certificates function is enabled, if the environment does not allow the host that runs PFM - RM for Virtual Machine to communicate with the Windows Update site, verifying the certificate might take a long time. In this case, modify the network environment so that the Update Root Certificates function can run normally, or change the Windows settings (the security policy settings of the OS) so that the Update Root Certificates function does not communicate with the Windows Update site.

If certificate verification takes too much time, the KAVL20014-W warning message is output to the common message log and the monitoring cannot be performed.

- Ignore the KAVL20205-W warning message that is output to the common message log

A certificate that is not signed by a CA is not a valid certificate and, therefore, the KAVL20205-W warning message is output to the common message log. Make sure that the message can be safely ignored for normal operation.

- Operation using a certificate that cannot be trusted

The default certificate of VMware is determined to be a certificate that cannot be trusted by certificate verification. Make sure that a certificate that cannot be trusted does not cause problems that affect operation.

## (1) Updating the certificate for VMware ESX

In VMware ESX 4.0 or later, the certificate created by default is not signed by a CA. Replace the default certificate by a CA-signed certificate, by referring to the appropriate VMware documentation (indicated below).

In VMware ESX 3.5, the certificate created by default is signed by a CA. Therefore, you do not need to perform the above operation.

In VMware ESX 4.0:

- *VMware vSphere 4.0 Technical Note  
Replacing vCenter Server Certificates*

In VMware ESX 4.1:

- *VMware vSphere 4.1 Technical Note  
Replacing vCenter Server Certificates*

In VMware ESX 5:

- **vSphere Security** on the vSphere 5 Documentation Center webpage  
*Replace a Default Host Certificate with a CA-Signed Certificate*

*Note:*

The above listed documentation names might be changed without a prior notice. For the latest information, contact the VMware support center.

## (2) How to obtain the certificate

If the version of VMware ESX is 4.0 or later, obtain a CA certificate as described in (1) above.

If the version of VMware ESX is 3.5, obtain a certificate by using the procedure described below.

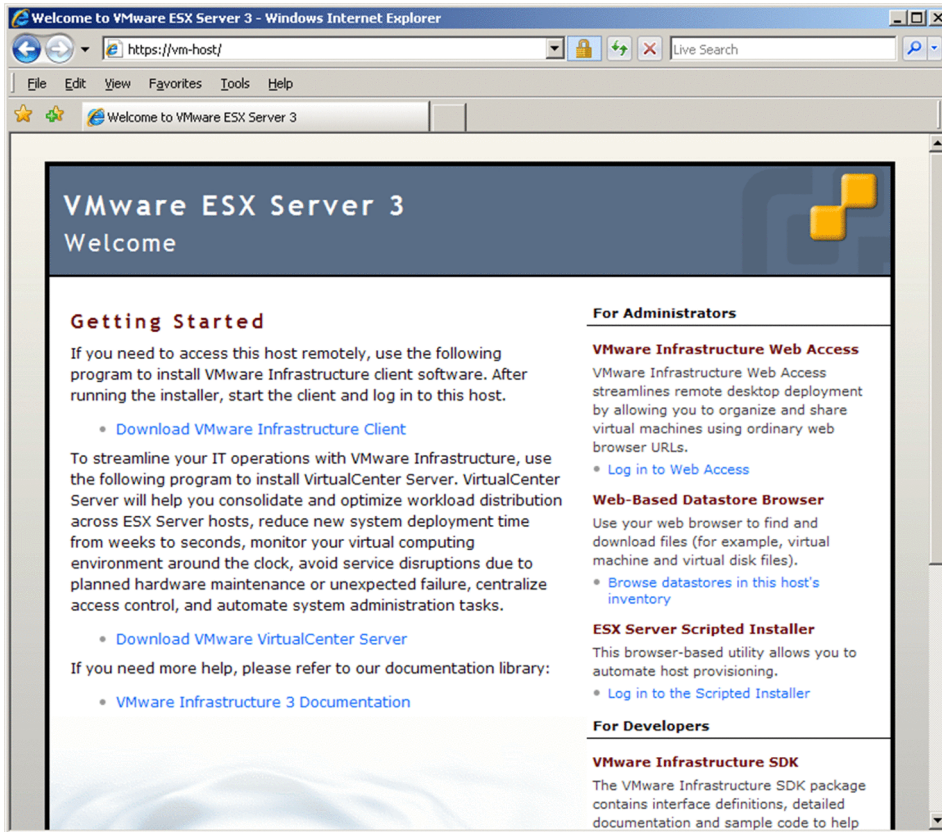
This subsection explains how to use Internet Explorer 7 to obtain a certificate.


The same procedure can be used with Internet Explorer 8 or Internet Explorer 9 or Internet Explorer 10 or Internet Explorer 11.

1. From Internet Explorer 7, access `https://vmhost`.

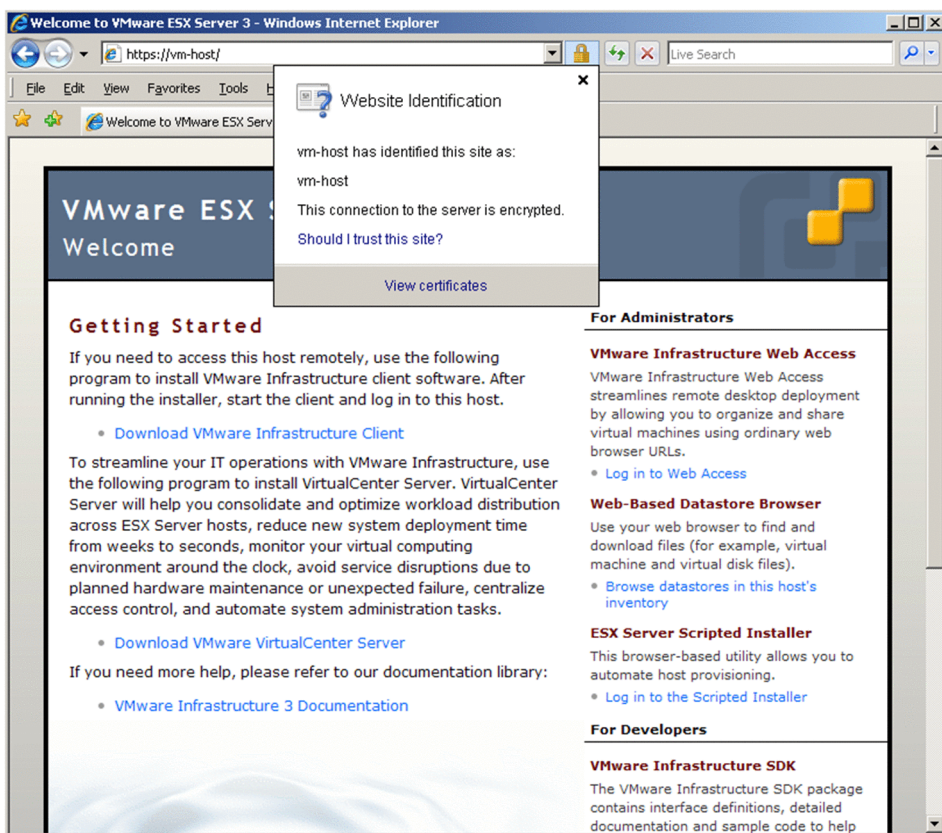
For *vmhost*, enter the host name of the monitored host. This explanation uses `vmhost` as an example.





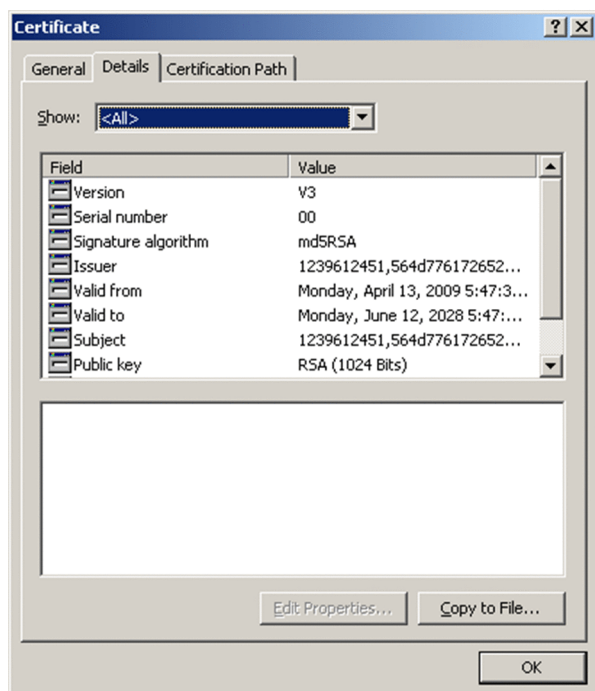
2. Click the  icon (SSL certificate) displayed to the right of the address bar.

The **Website Identification** pull-down menu is displayed.



3. Click **View certificates**.

The Certificate dialog box opens.

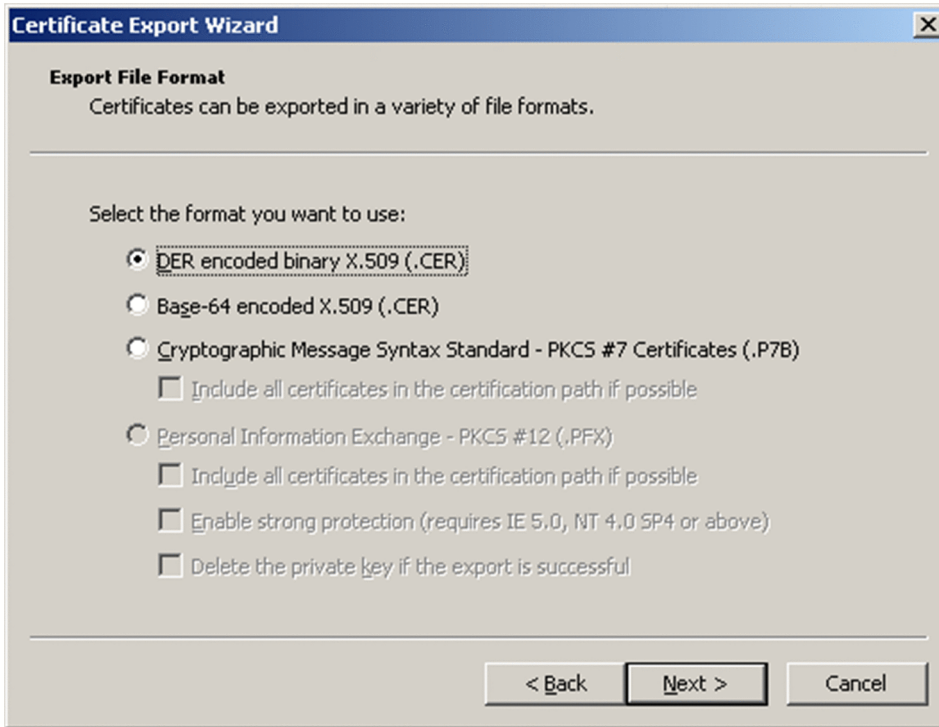


4. Choose the **Details** tab and click **Copy to File**.

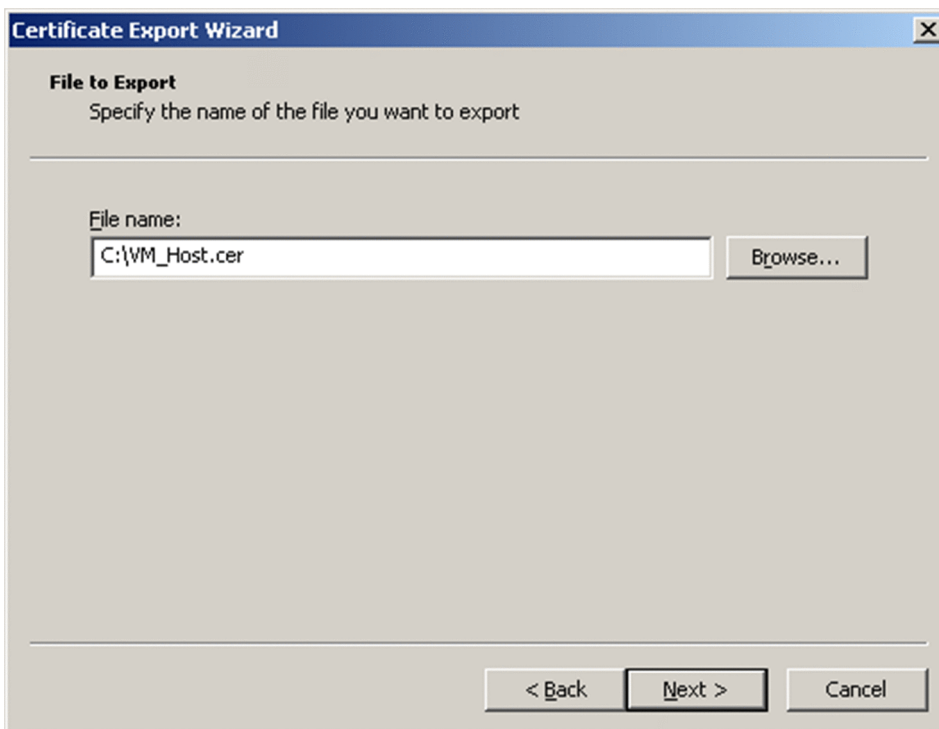
The Certificate Export Wizard dialog box opens.



5. Click **Next**.



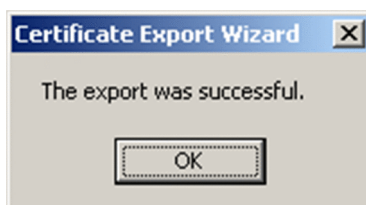
6. Select **DER encoded binary X.509 (.CER)**, and then click **Next**.



7. In the **File name** text box, enter the file name under which to save the certificate, and then click **Next**.  
Here, `C:\VM_Host.cer` is entered as an example.



8. Click **Finish**.



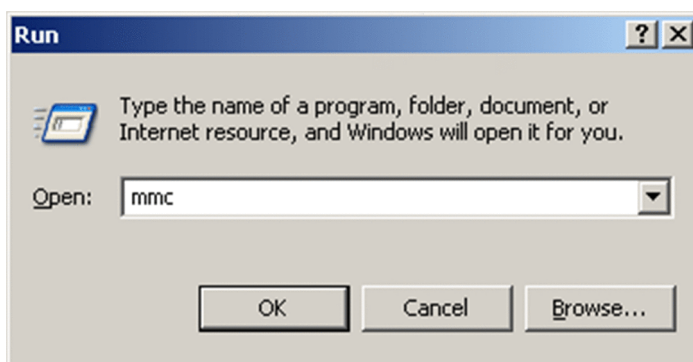
9. Click **OK**.

### (3) Importing the default certificate for VMware

After you have prepared a CA certificate for VMware as described in (2) above, import the certificate onto the PFM-VM host. To import the certificate:

1. In Windows, choose **Start** and then **Run**.

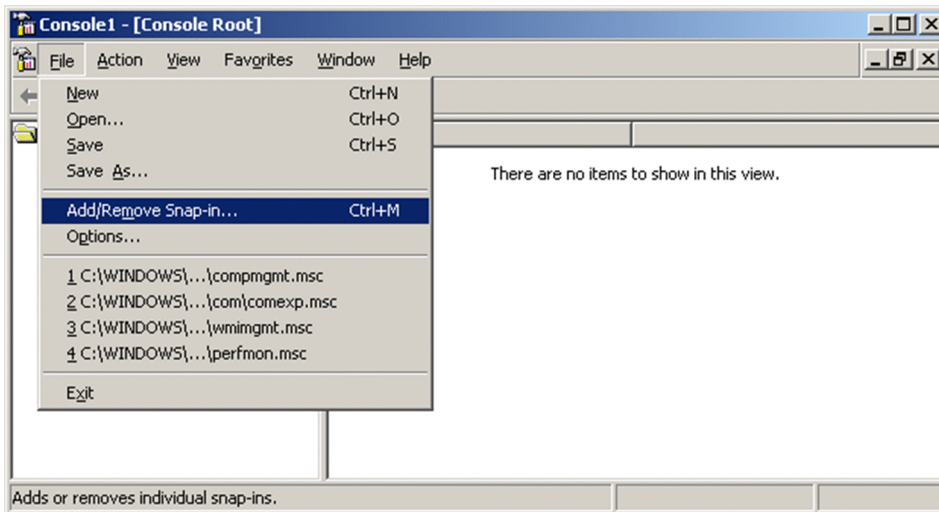
The Run dialog box opens.



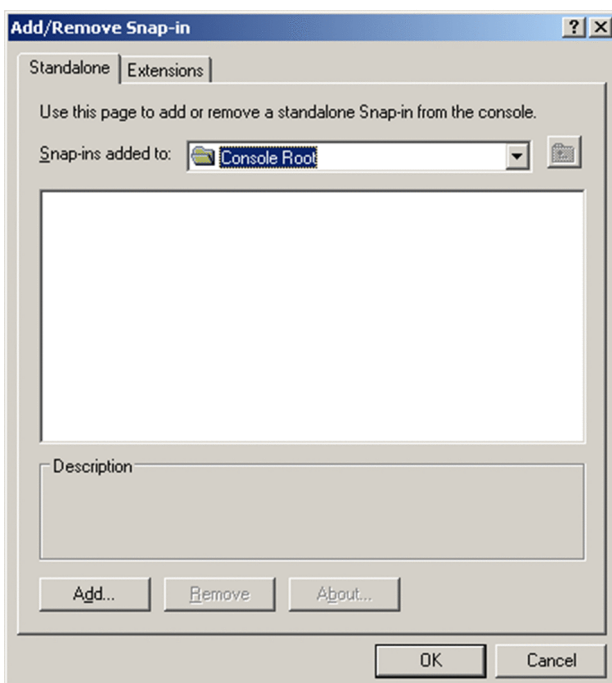
2. In the Run dialog box, enter `mmc` and click **OK**.

Management Console starts.

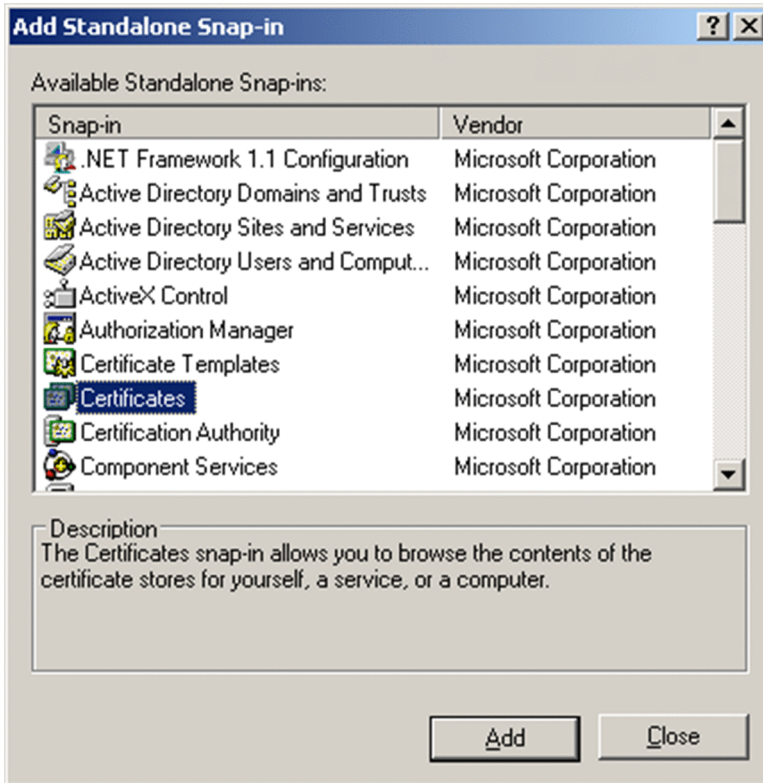




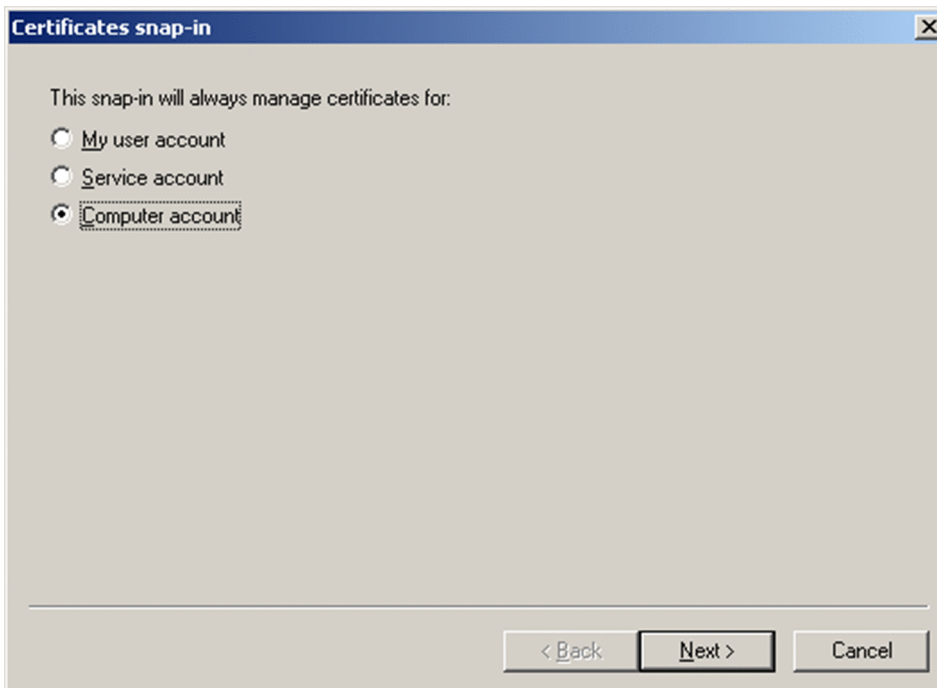
3. In **Console1**, choose **File** and then **Add/Remove Snap-in**.  
The Add/Remove Snap-in dialog box opens.



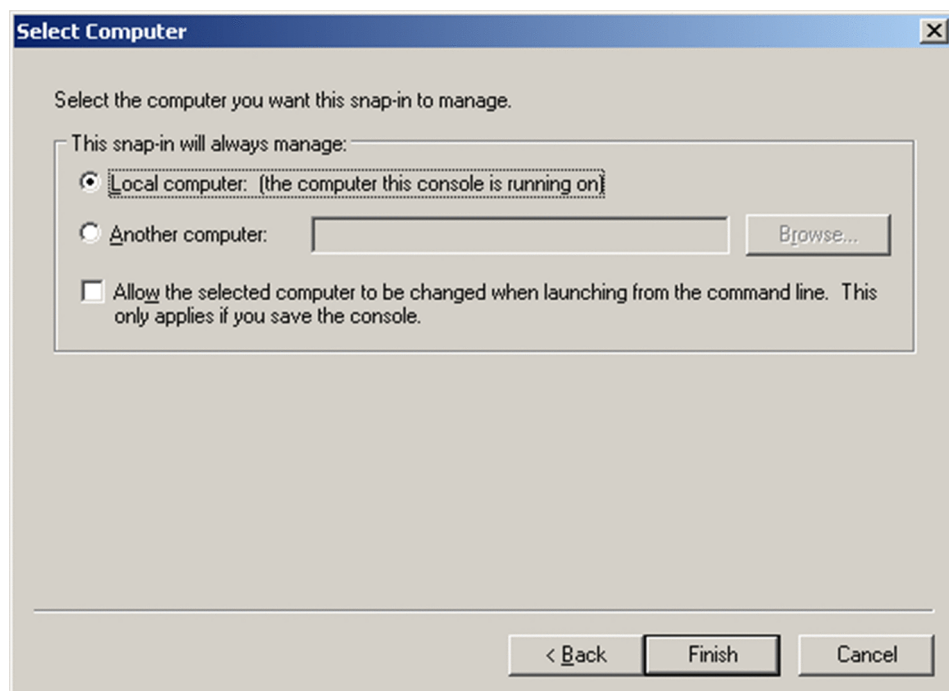
4. Click **Add**.  
The Add Standalone Snap-in dialog box opens.



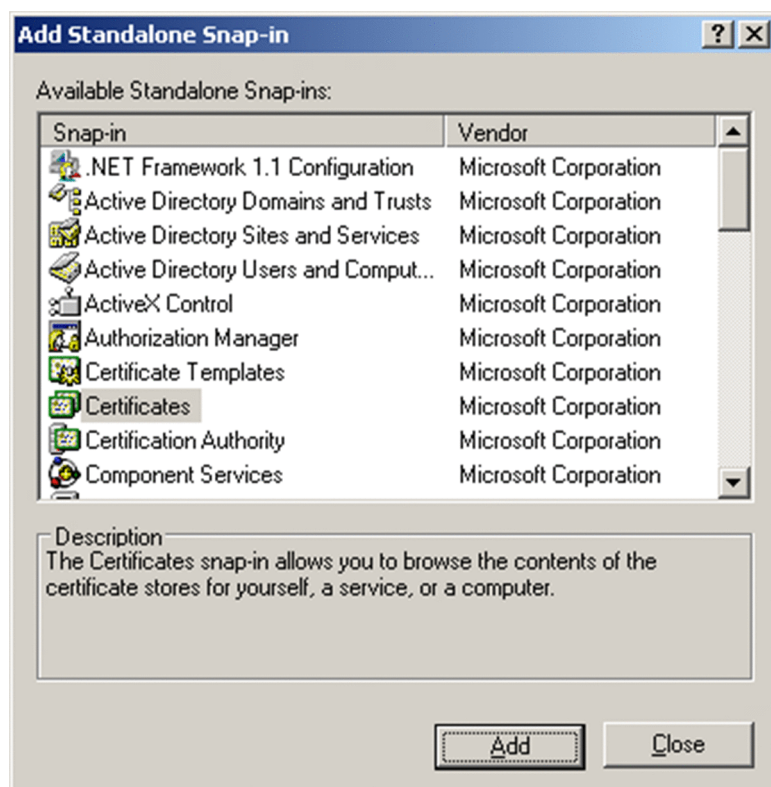
- From **Available Standalone Snap-ins**, choose **Certificates** and then click **Add**. The Certificates snap-in dialog box opens.



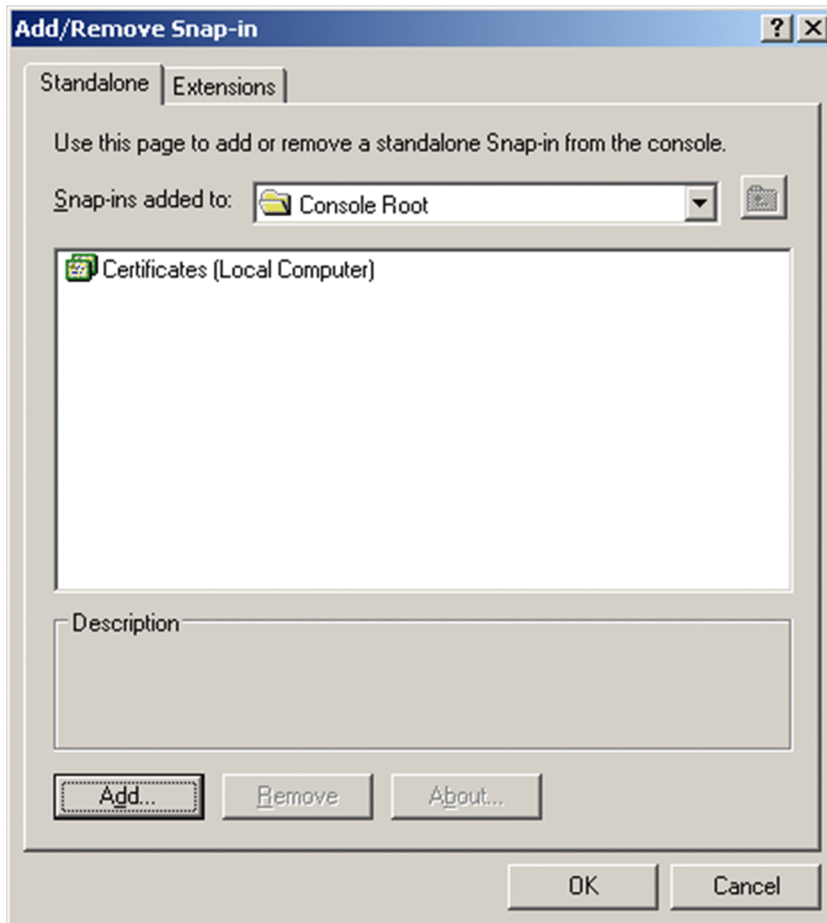
- Choose **Computer account** and then click **Next**. The Select Computer dialog box opens.



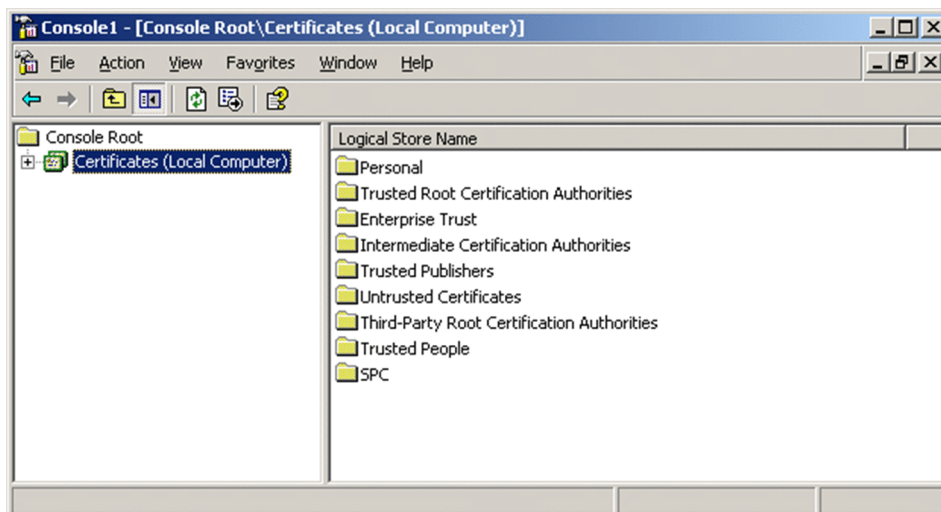
7. Choose **Local computer** and click **Finish**.



8. In the Add Standalone Snap-in dialog box, click **Close**.

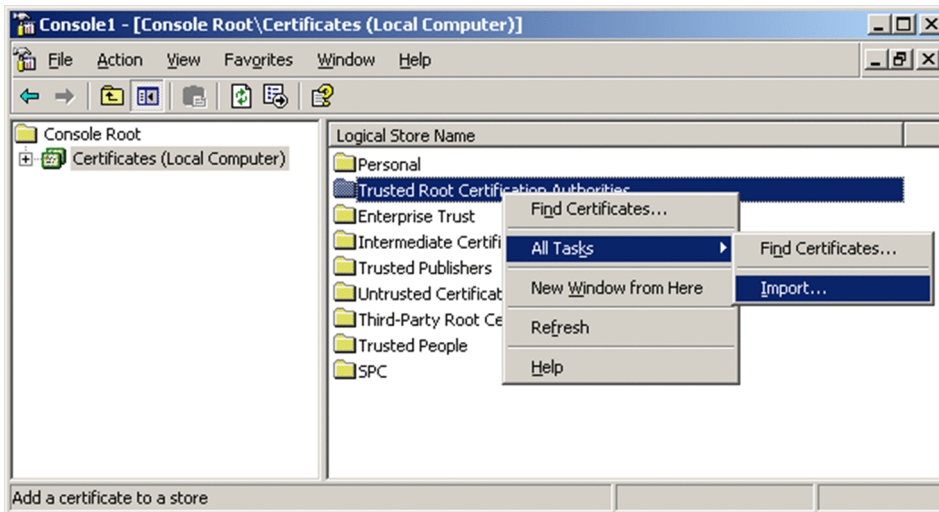


9. In the Add/Remove Snap-in dialog box, click **OK**.

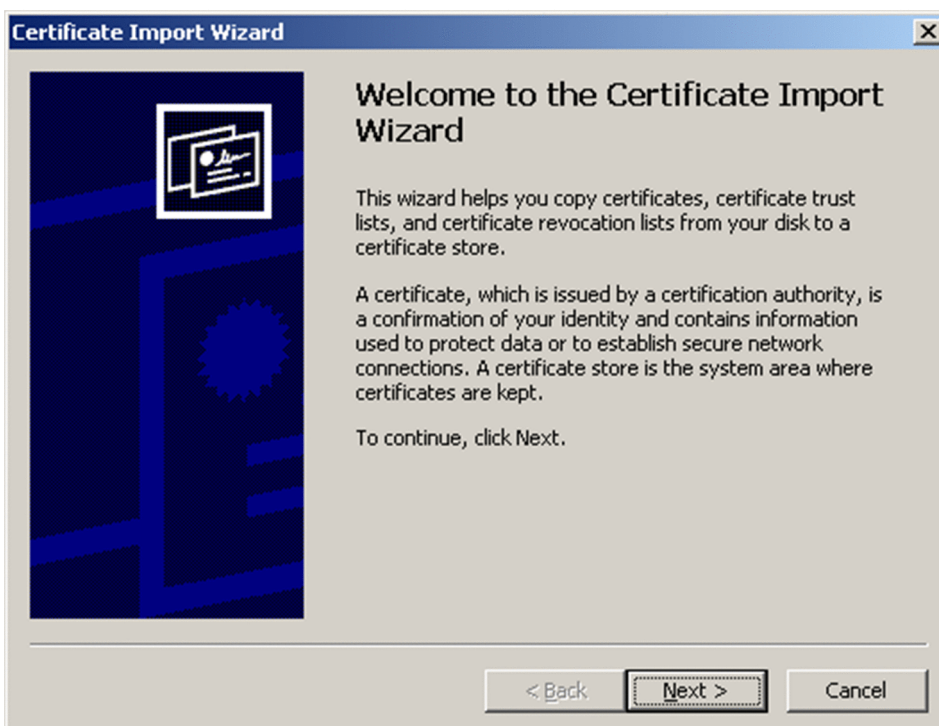


10. In **Console1**, choose **Console Root** from the left pane and then **Certificates (Local computer)**.

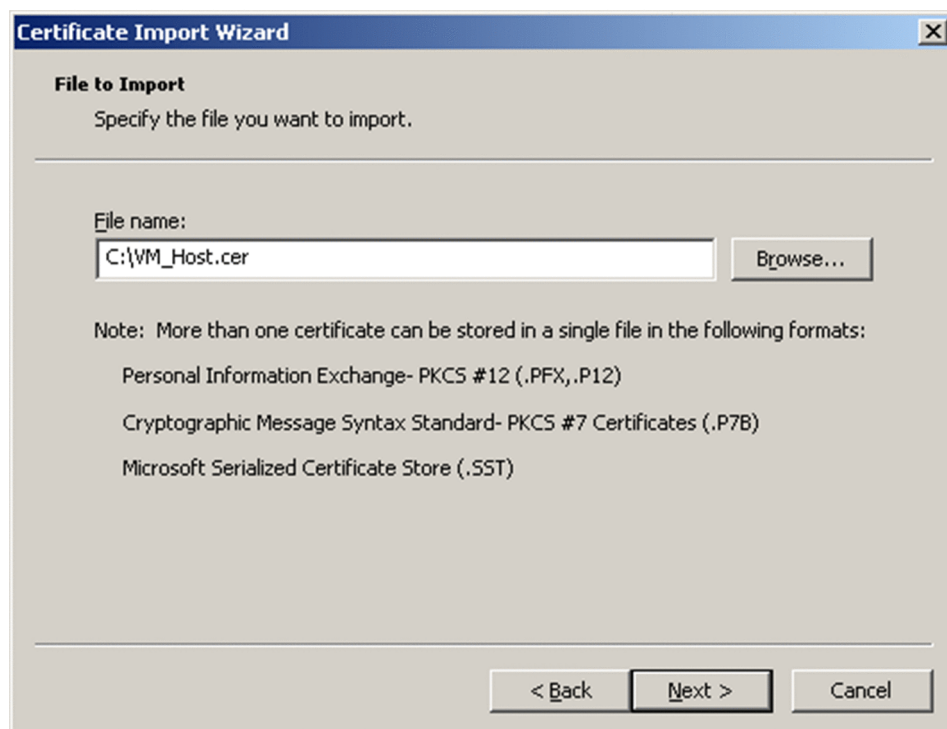




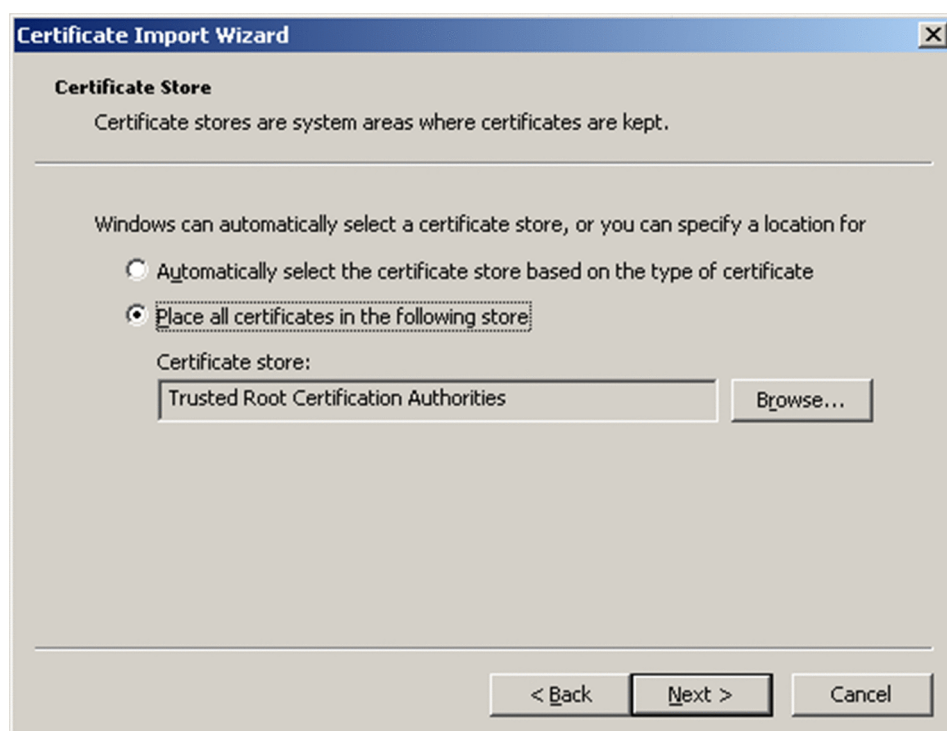
11. In the right pane of **Console1**, right-click **Trusted Root Certification Authorities**, then **All Tasks** and **Import**. The Certificate Import Wizard dialog box opens.



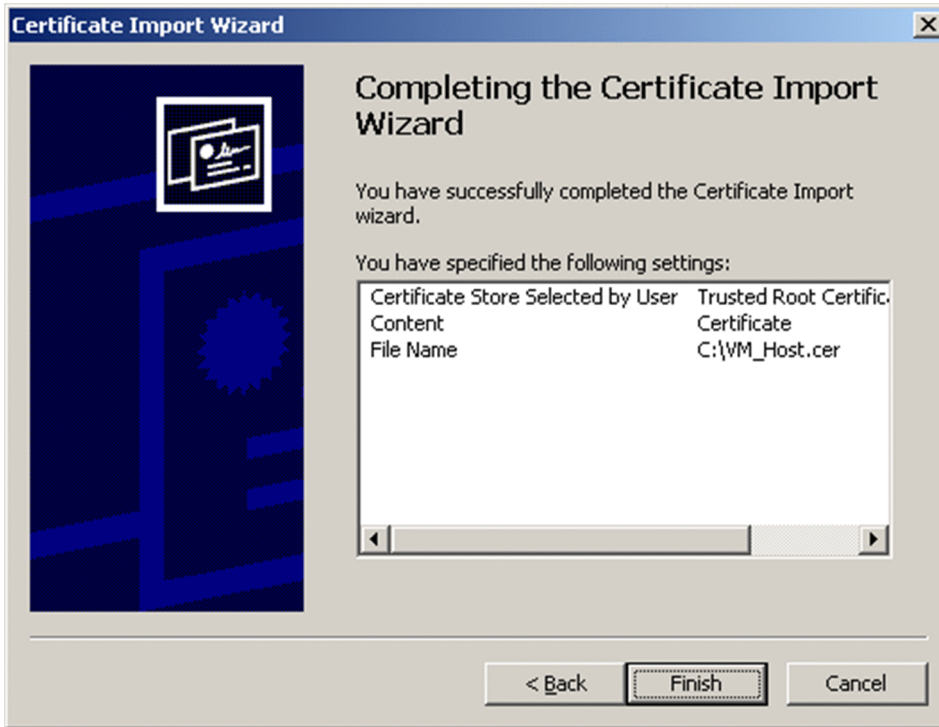
12. Click **Next**.



13. In the **File name** text box, enter the file name under which to save the certificate, and then click **Next**.



14. Choose **Place all certificates in the following store**, and then click **Next**.



15. Click **Finish**.



16. Click **OK**.

### Important note

If a problem occurs due to a certificate that has been installed as described in the above procedure, check whether the obtained certificate is valid. Whether the certificate is valid can be determined from the following items:

- Validity period
- Where it is being published to (whether the same host name as the name of the host that runs VMware is set)

If there is a problem with the certificate, re-create a certificate on the VMware side, and then re-install the certificate by using the procedure described above. For details about how to create a certificate, see the VMware documentation.

## 2.5.2 For Hyper-V

When the virtual environment to be monitored is Hyper-V, PFM - RM for Virtual Machine uses WMI to collect performance data from the monitored host. If a WMI connection has not been set up, performance data cannot be collected. Therefore, you must set up WMI on the PFM - RM host and the monitored host.

### (1) Setting up WMI connection

This subsection explains how to set up WMI connection.

The following are the settings for connecting WMI:

- DCOM  
You must set DCOM on both the PFM - RM host and the monitored host.  
If you run the PFM - RM host in a cluster system, set DCOM at both the executing node and the standby node. Note also that if you use Windows MSCS with cluster software, you must set the distributed transaction coordinator (MSDTC) resources. For details about the setup method, see technical support on Microsoft's home page.
- Firewall  
Set a firewall on the monitored host, if necessary.
- WMI namespace  
Set a WMI namespace on the monitored host, if necessary.

When the above settings have been made, check that connection can be established from the PFM - RM host to the monitored host. For details about how to check the connection, see (2) *Checking the WMI connection status*.

*Note about setting up WMI connection:*

Data cannot be collected if the startup type of the Windows Management Instrumentation service (service name: WinMgmt) that provides system management information for the OS of the monitored host is disabled.

### (a) Environment settings required for connection

The following settings are required in order to set WMI:

- User account settings  
To use WMI, you must have accounts for the PFM - RM host and the monitored host.
  - Account for the PFM - RM host  
To set up an account, specify the appropriate values for `HostUserID`, `HostPassword`, and `HostDomain`, as shown in Table 2-5. You specify this account when you set up an instance.  
If you run PFM - RM for Virtual Machine in a cluster system, set up an account for the PFM - RM host in such a manner that the same user name and password can be used to log on to both the running system and the standby system.
  - Account for the monitored host  
To set up an account, specify the appropriate values for `UserID`, `Password`, and `Domain`, as shown in Table 2-8. You specify this account when you set up the monitoring target.  
In Windows Server 2008, The account to be used either following User.  
For Domain account user :
    1. Domain Administrator's user.  
For Local account user :
    1. Built-in Administrator's user.

## 2. Member of Administrators group#.

In Windows Server 2012, The account to be used either following User.

For Domain account user :

1. Domain Administrator's user.

For Local account user :

1. Built-in Administrator's user.
2. Member of Administrators group#.
3. Member of Performance Log Users or Performance Monitor Users group and Hyper-V Administrators group.

#

If used member of the administrators group(other than Built-in Administrator's account user), UAC restricts the permissions, causing the user to log on as a general user. As a result, performance information might not be acquired due to denial of access.

To prevent this, disable UAC or execute the following command on the monitoring target:

```
reg add HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Policies\System /v LocalAccountTokenFilterPolicy /t REG_DWORD /d 1 /f
```

To override the settings specified by the above command and restore the previous status, execute the following command:

```
reg delete HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Policies\System /v LocalAccountTokenFilterPolicy /f
```

- WMI service settings

Set the monitored host's WMI service startup to a setting other than **Disabled**. If it is set to **Disabled**, performance data cannot be collected.

## (b) Setting DCOM

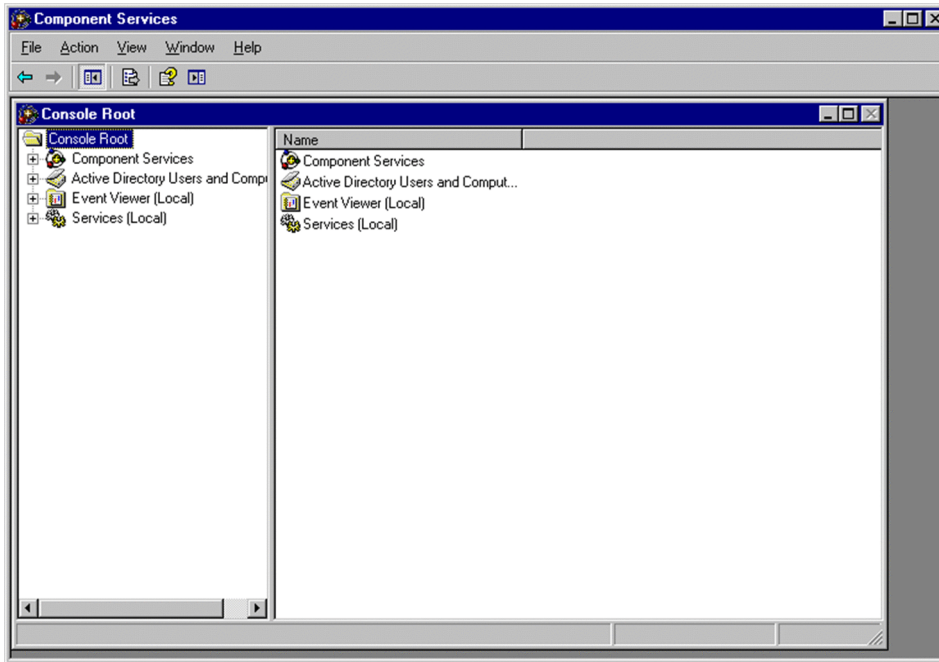
This subsection describes how to set DCOM on the PFM - RM host and the monitored host.

- Setting on the PFM - RM host

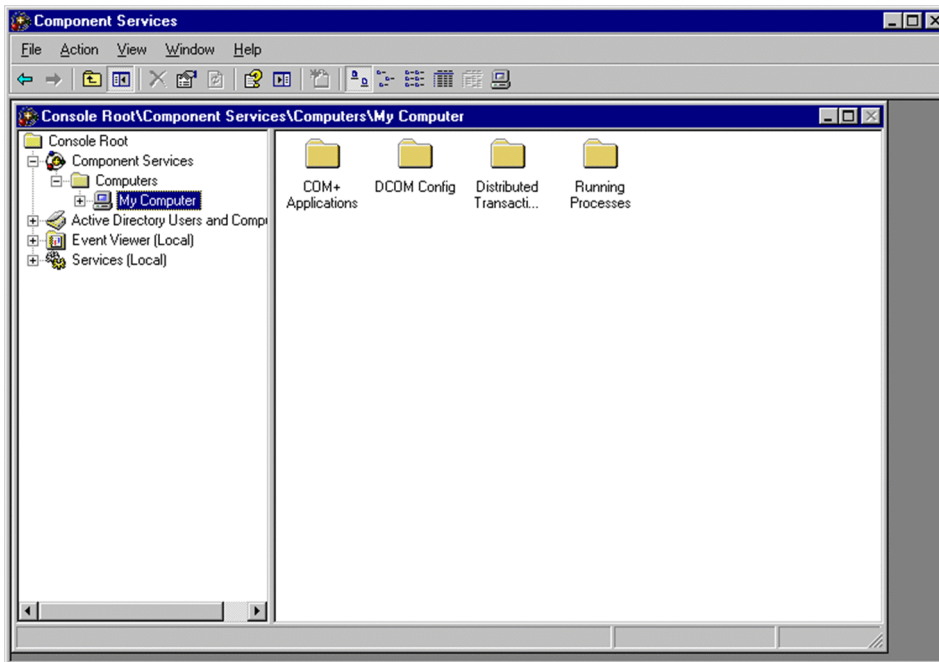
To set DCOM on the PFM - RM host:

1. In Windows, choose **Start**, and then **Run**.
2. Enter `dcomcnfg.exe`, and then click the **OK** button.

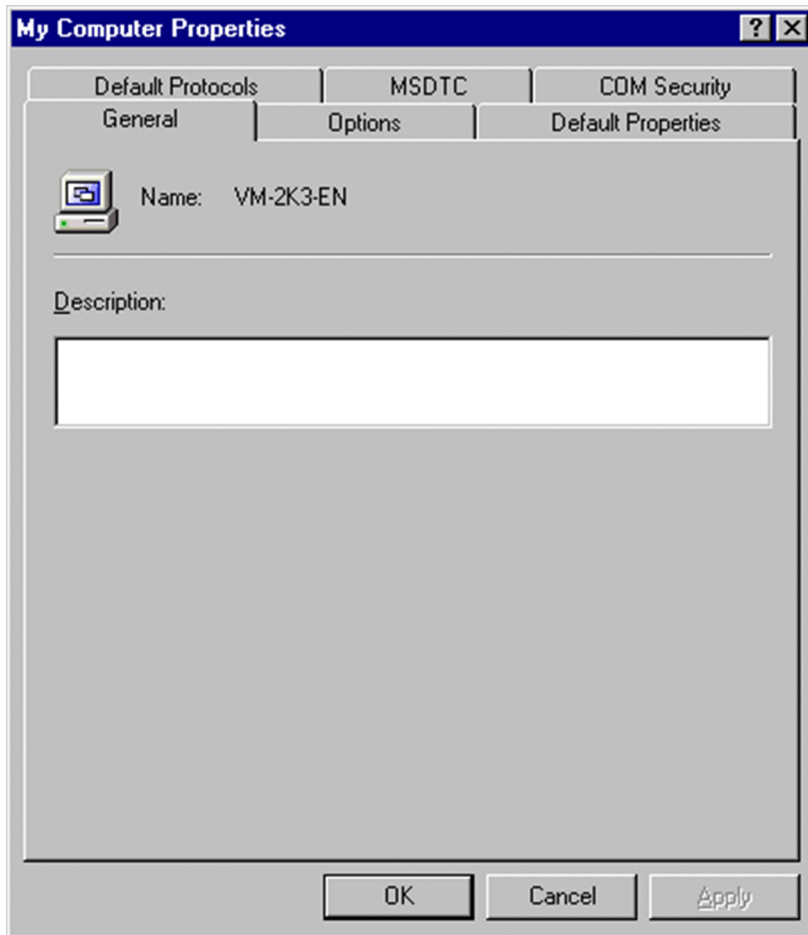
The Component Services window appears.



3. Click **Component Services**, then **Computers** to expand the tree.

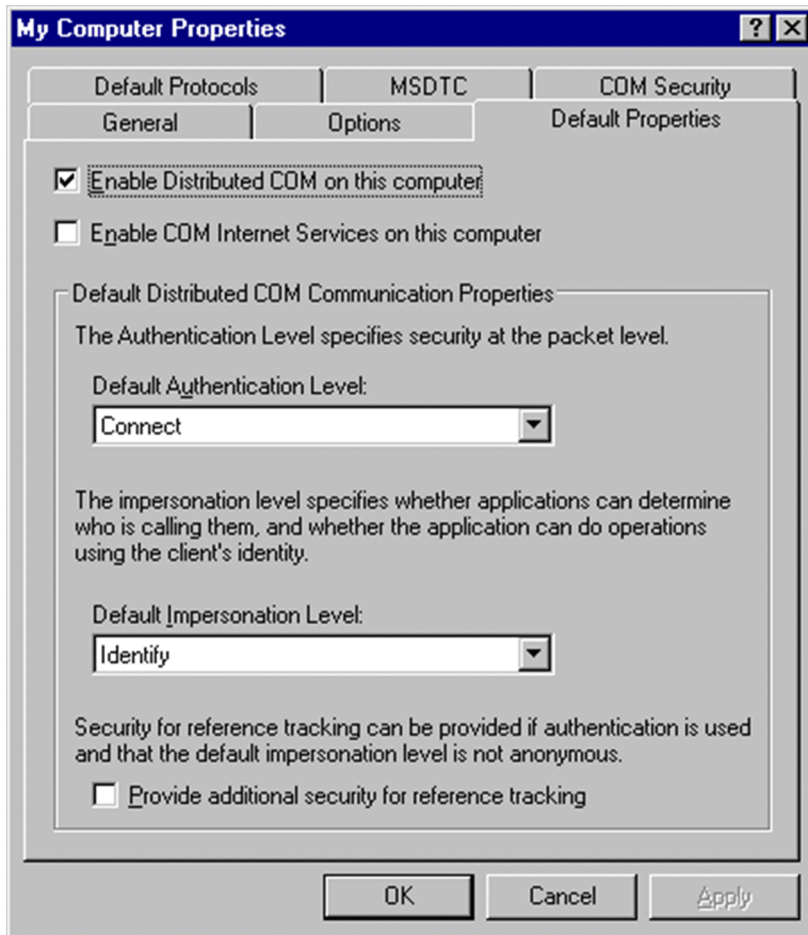


4. Choose **My Computer** and then, from the right-click menu, choose **Properties**.  
The My Computer Properties dialog box appears.



5. Choose the **Default Properties** tab, and then select **Enable Distributed COM on this computer**.





6. Click the **OK** button.

The My Computer Properties dialog box closes.

7. Restart the host.

This is necessary only when the **Enable Distributed COM on this computer** setting has been changed.

- Setting on the monitored host

This subsection describes how to set DCOM on the monitored host.

To set DCOM on the monitored host:

1. In Windows, choose **Start** and then **Run**.

2. Enter `dcomcnfg.exe`, and then click the **OK** button.

The Component Services window appears.

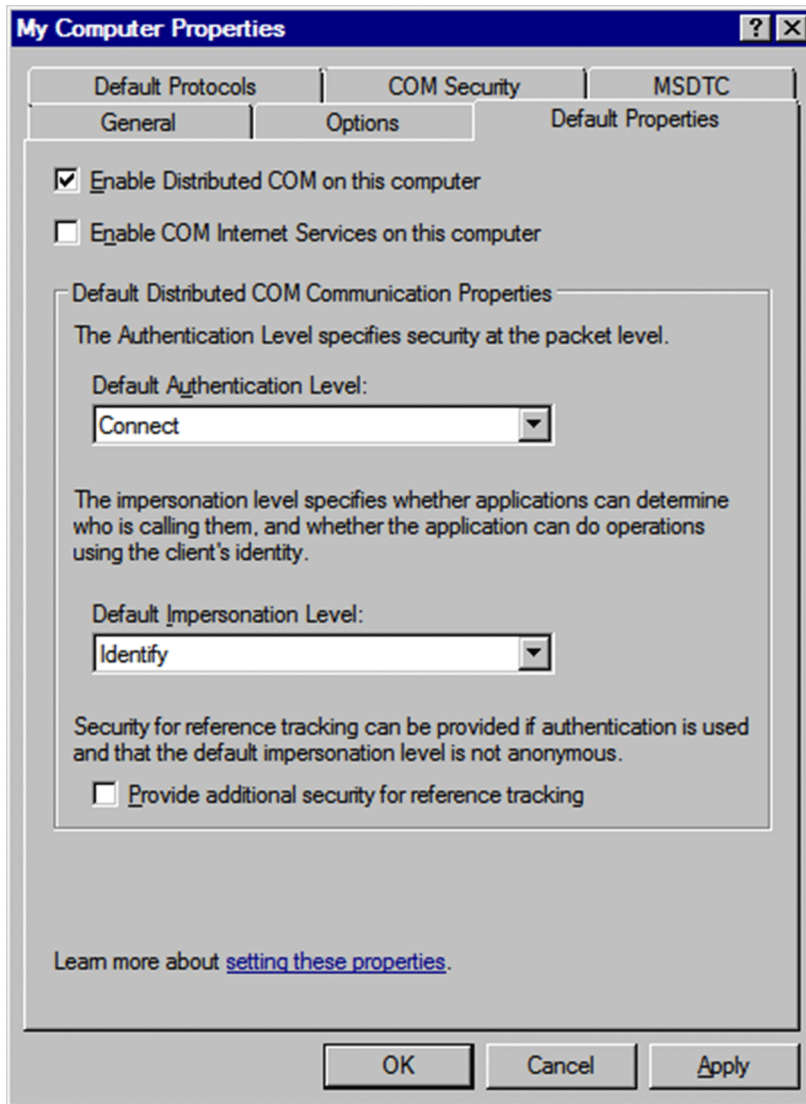
3. Click **Component Services**, then **Computers**, to expand the tree.

4. Choose **My Computer** and then, from the right-click menu, choose **Properties**.

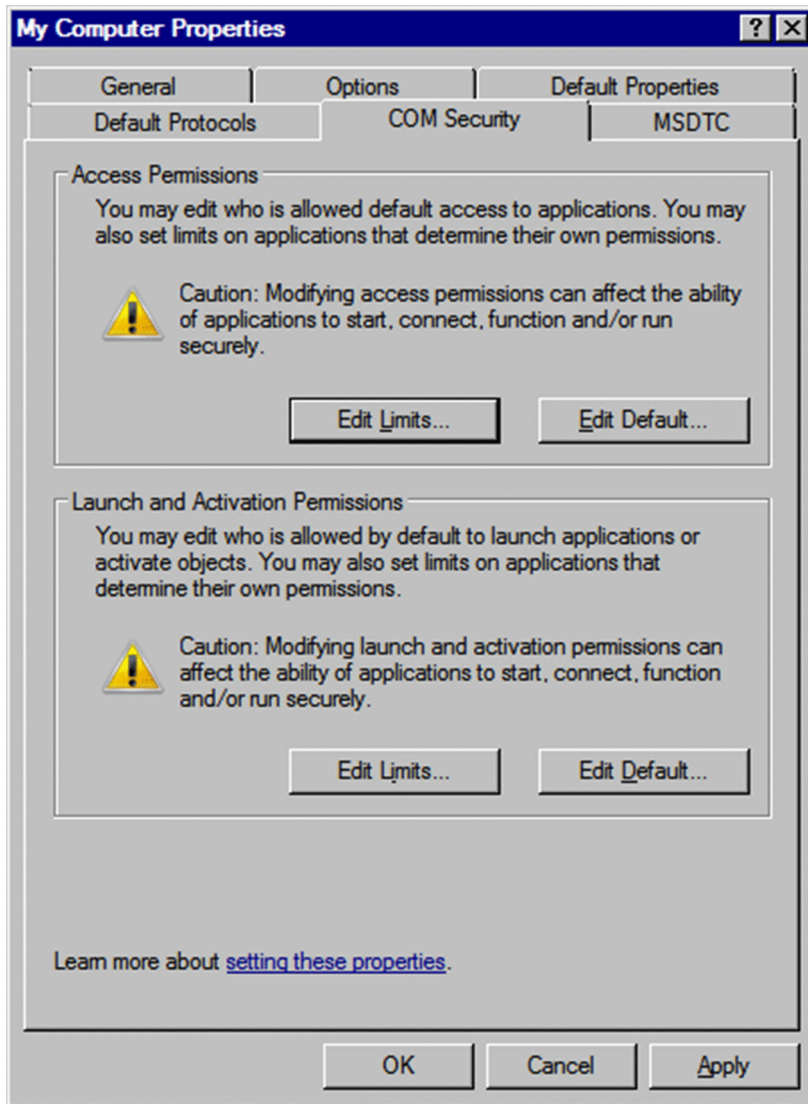
The My Computer Properties dialog box appears.

5. Choose the **Default Properties** tab, and then select **Enable Distributed COM on this computer**.





6. Select the **COM Security** tab and then, in **Access Permissions**, click the **Edit Limits** button.

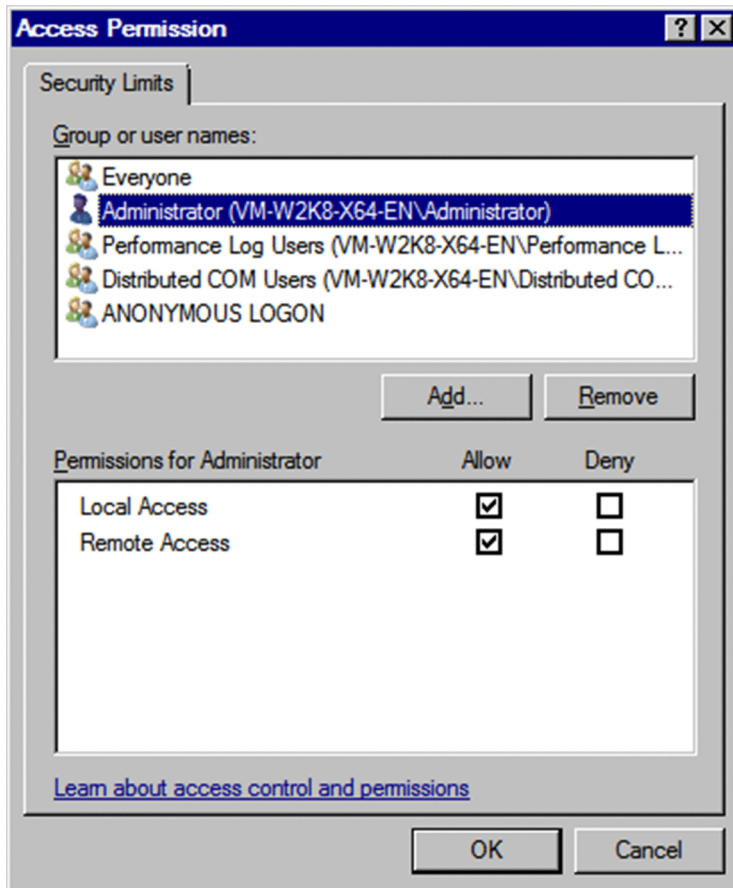


The Access Permission dialog box appears.

Check if the user who connects to the monitored host or the group to which this user belongs is displayed in **Group or user names**.

If the user or its group is not displayed, click the **Add** button and add the user or the group.

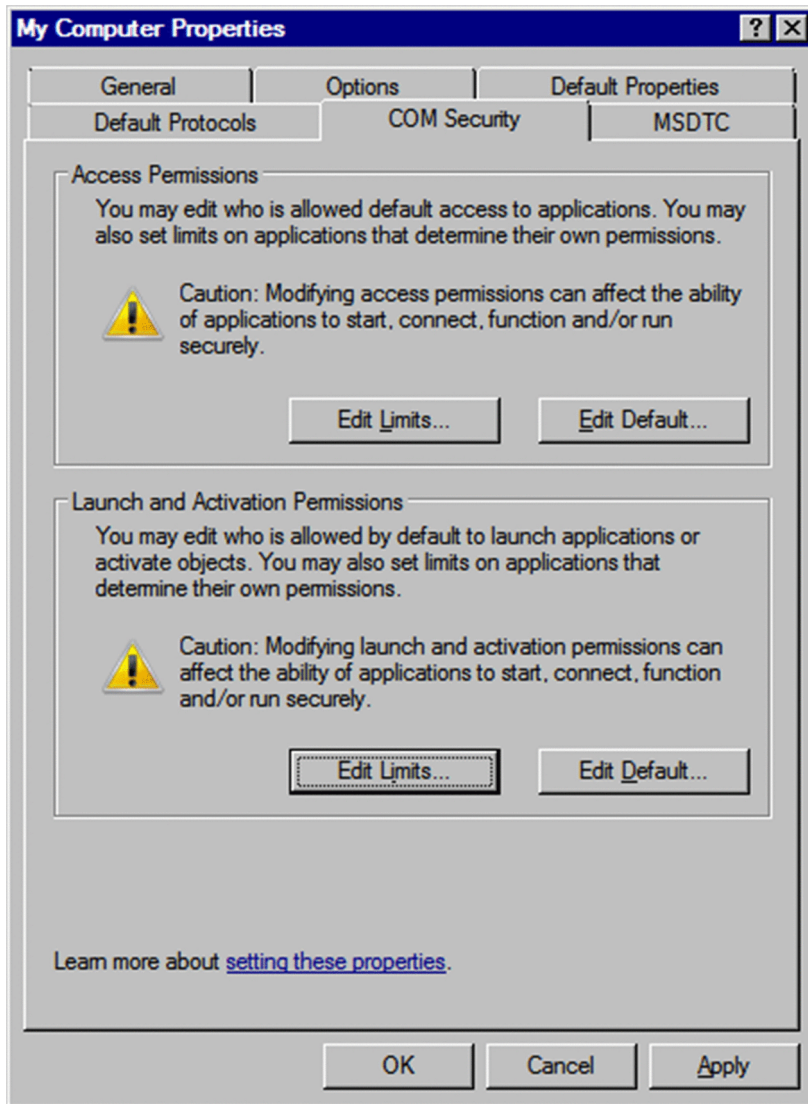
7. In **Group or user names**, select the user that connects to the monitored host or the group to which this user belongs. Check that the check box for **Allow** is selected for **Remote Access**. If this check box is cleared, select it.



8. Click the **OK** button.

The Access Permission dialog box closes.

9. Select the **COM Security** tab and then, in **Launch and Activation Permissions**, click the **Edit Limits** button.

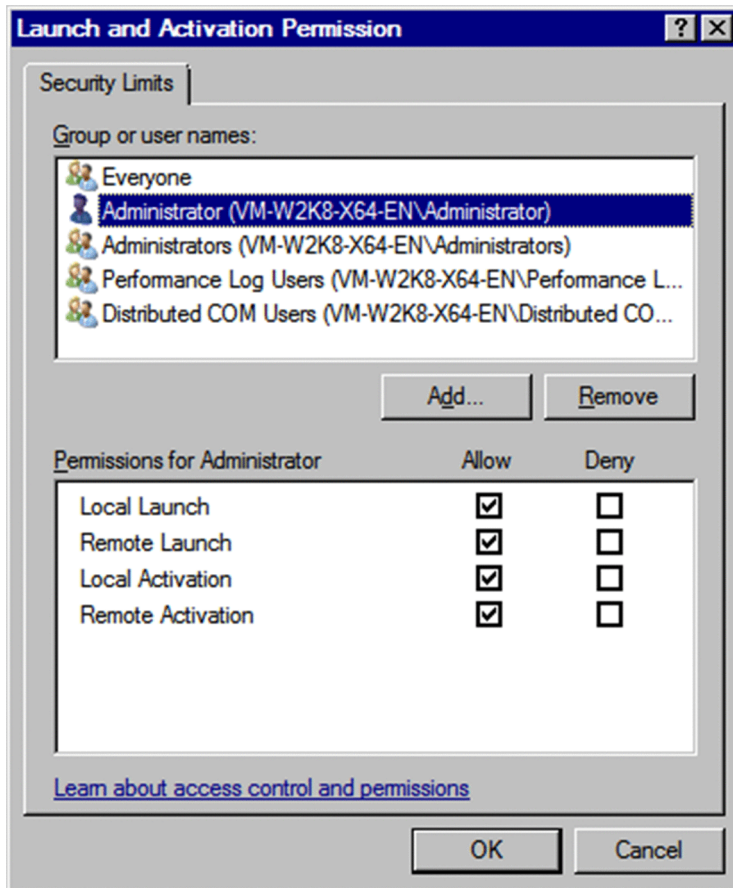


The Launch and Activation Permission dialog box is displayed.

Check if the user who connects to the monitored host or the group to which this user belongs is displayed in **Group or user names**.

If the user or its group is not displayed, click the **Add** button and add the user or the group.

10. In **Group or user names**, select the user that connects to the monitored host or the group to which this user belongs. Check that the check boxes for **Allow** are selected for **Remote Launch** and **Remote Activation**. If these check boxes are cleared, select them.



11. Click the **OK** button.

The Launch and Activation Permission dialog box closes and the My Computer Properties dialog box is displayed.

12. Click the **OK** button.

The My Computer Properties dialog box closes.

13. Restart the host.

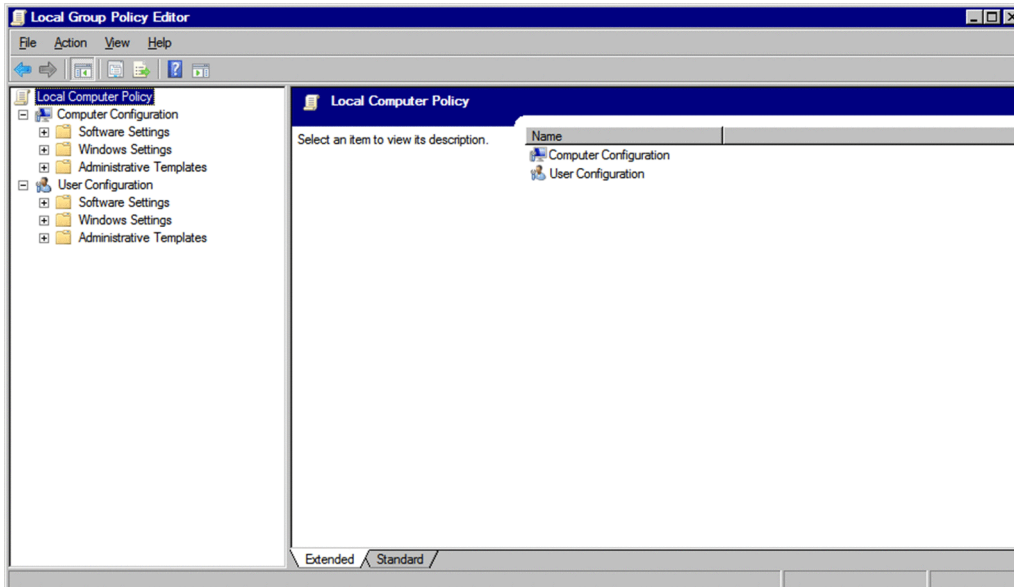
This is necessary only when the **Enable Distributed COM on this computer** setting has been changed.

### (c) Setting a firewall

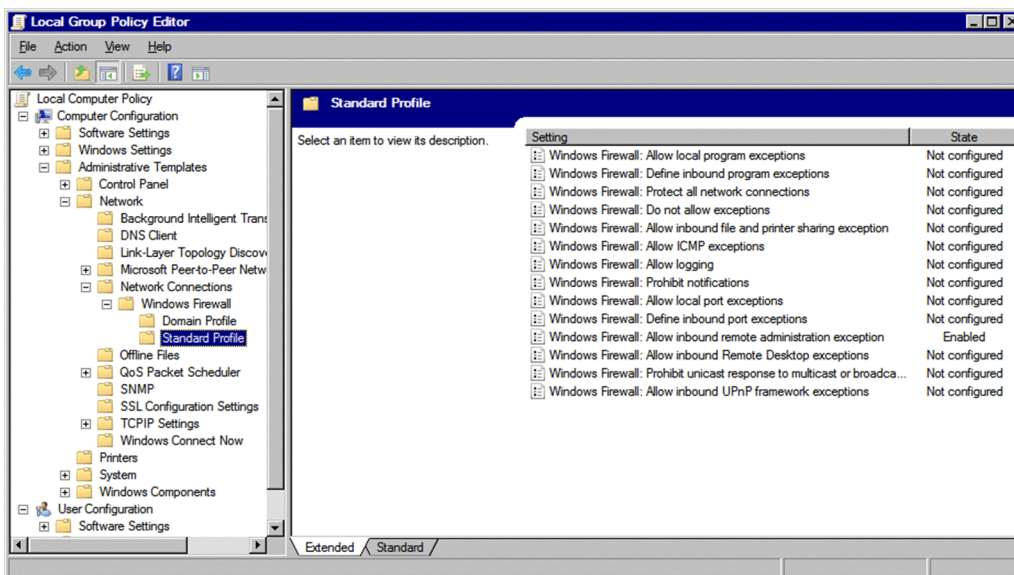
If the Windows firewall is enabled, you must perform this setting. For details about how to check the firewall status, see (3) *Checking the Windows firewall settings*.

To set a firewall:

1. In Windows, choose **Start** and then **Run**.
  2. Enter `gpedit.msc`, and then click the **OK** button.
- The Local Group Policy Editor window is displayed.



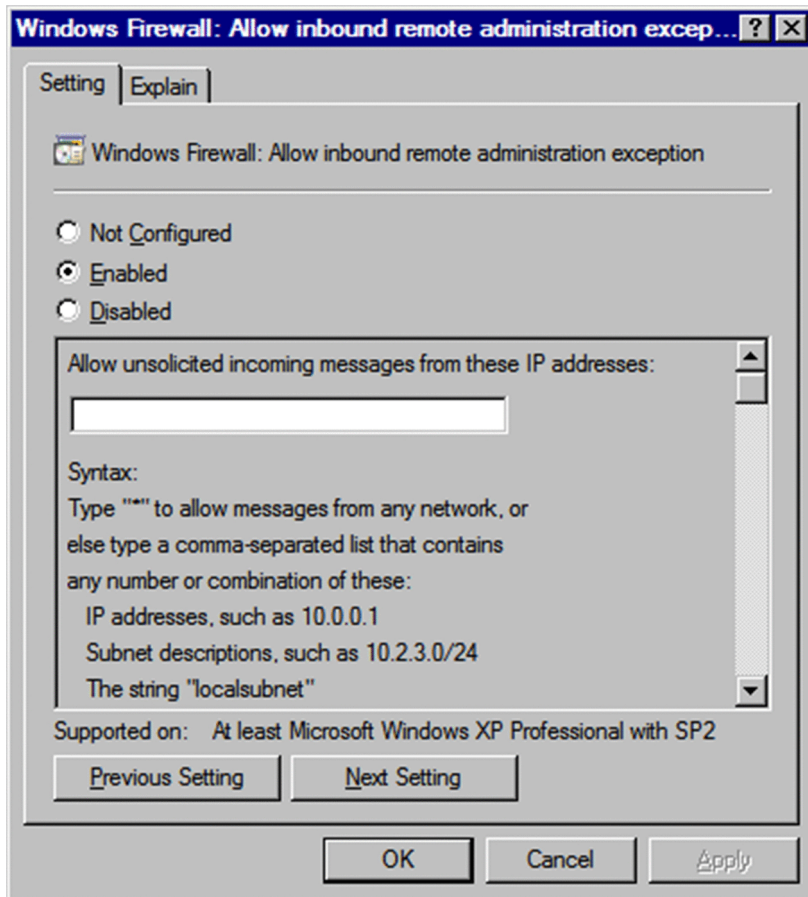
3. Click **Computer Configuration**, **Administrative Templates**, **Network**, **Network Connections**, and **Windows Firewall** in this order to expand the tree.



4. Click **Standard Profile**<sup>#</sup> and then, in the right-hand pane, from the right-click menu of **Windows Firewall: Allow inbound remote administration exception**, choose **Properties**.

The Windows Firewall: Allow inbound remote administration exception Properties dialog box is displayed.





#

If the host is a domain environment, click **Domain Profile** instead.

5. Choose the **Setting** tab, and then select **Enabled**.

6. Click the **OK** button.

The Windows Firewall: Allow inbound remote administration exception Properties dialog box closes.

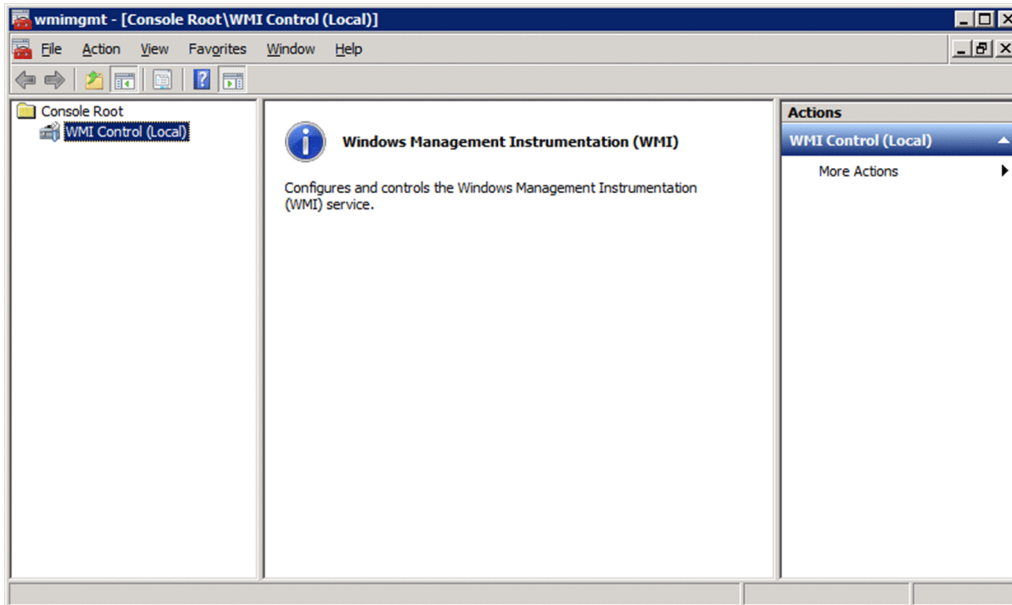
#### (d) Setting a WMI namespace

To set a WMI namespace:

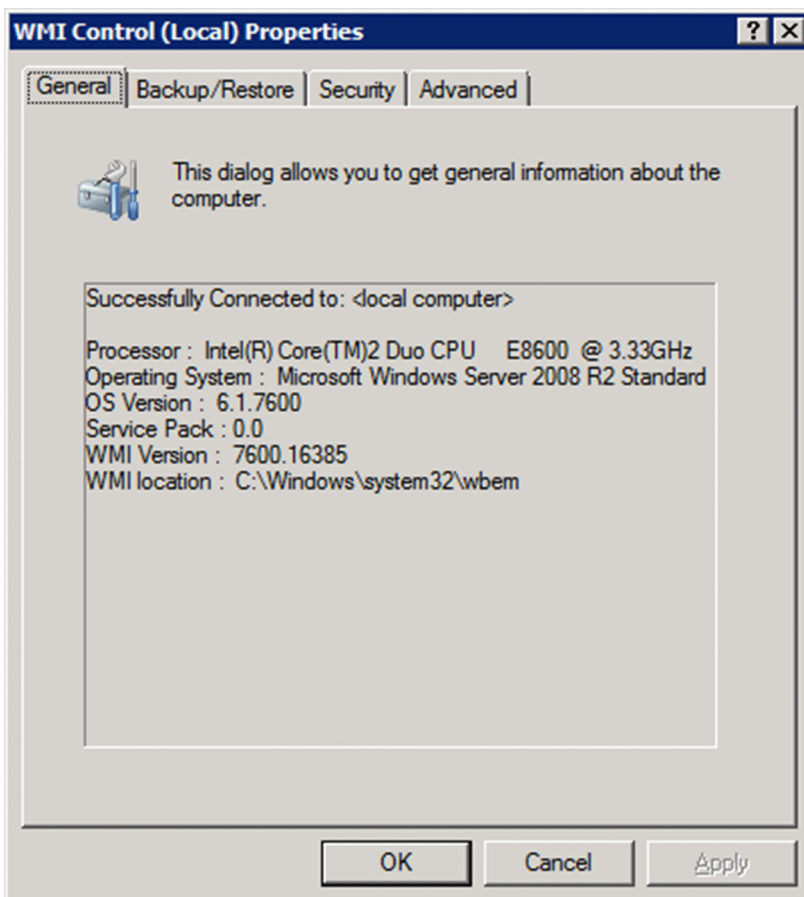
1. In Windows, choose **Start** and then **Run**.

2. Enter `wmimgmt.msc`, and then click the **OK** button.

The `wmimgmt - [Console Root\WMI Control (Local)]` window is displayed.

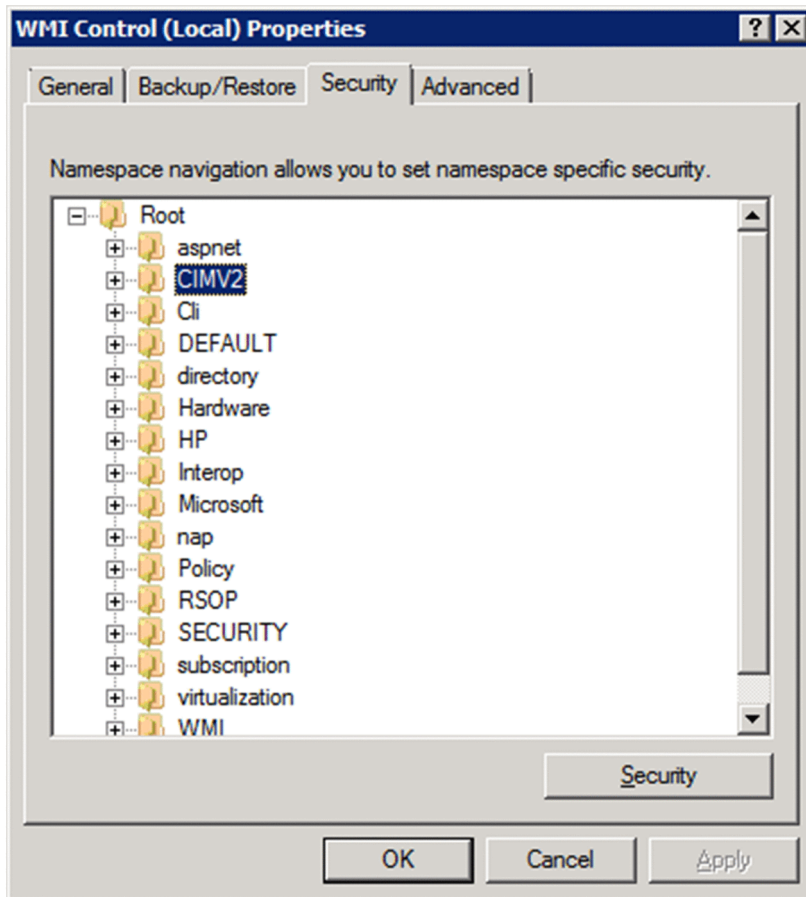


3. Choose **WMI Control (Local)** and then, from the right-click menu, choose **Properties**.  
The WMI Control (Local) Properties dialog box is displayed.



4. On the **Security** page, click **Root** and then **CIMV2**, and then select **CIMV2**.





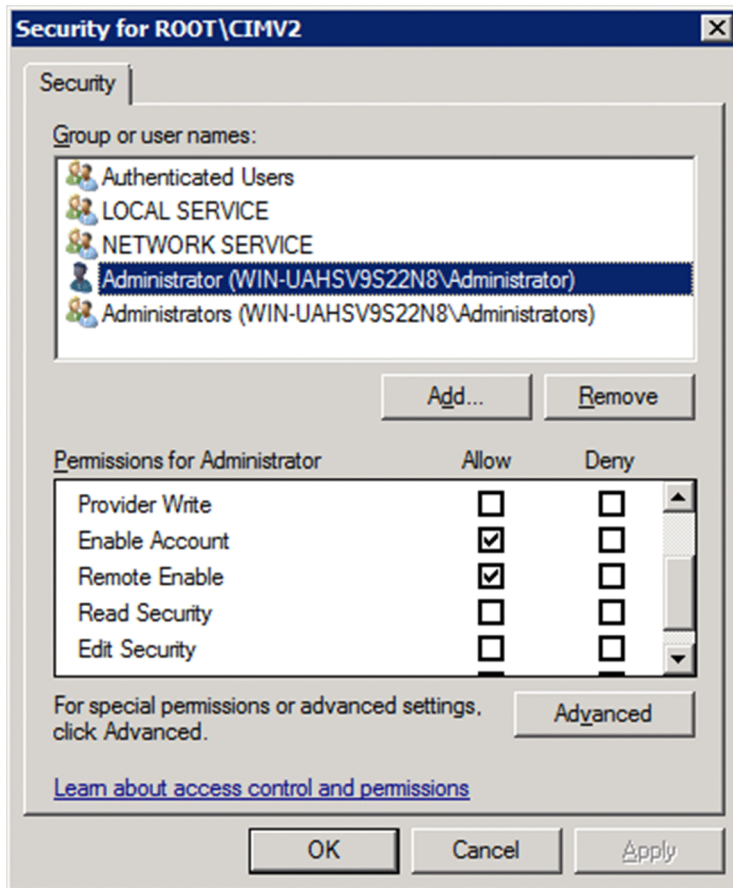
5. Click the **Security** button.

The Security for ROOT\CIMV2 dialog box is displayed.

Check if the user who connects to the monitored host or the group to which this user belongs is displayed in **Group or user names**. If the user or its group is not displayed, click the **Add** button and add the user or the group.

6. In **Group or user names**, select the user that connects to the monitored host or the group to which this user belongs.

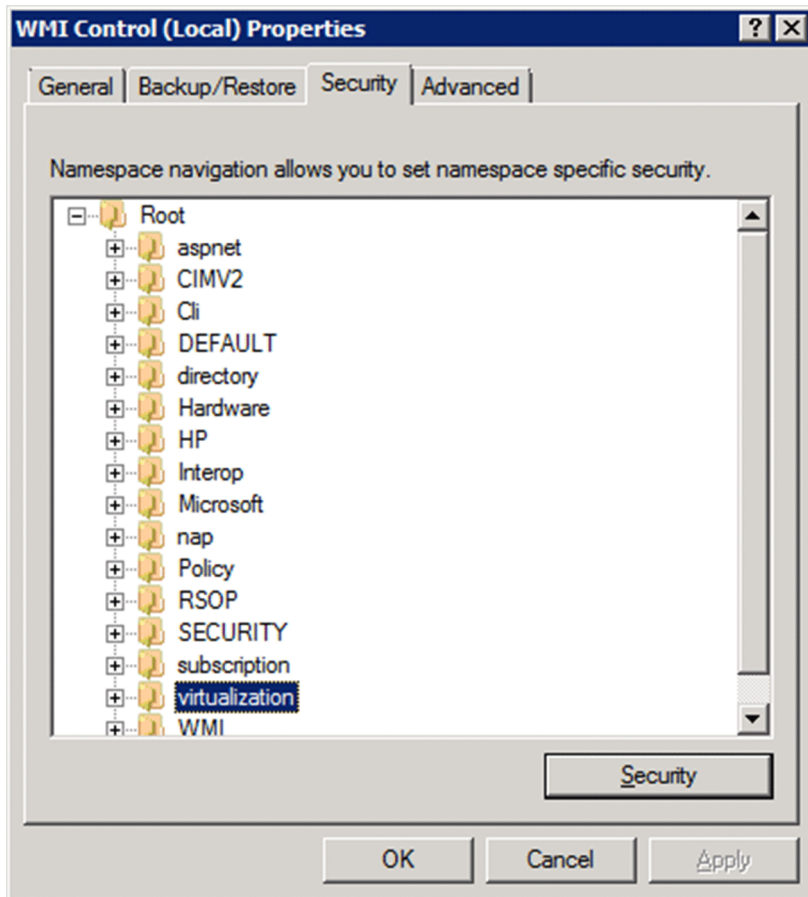
Check if the check boxes for **Allow** are selected for **Enable Account** and **Remote Enable**. If these check boxes are cleared, select them.



7. Click the **OK** button.

The Security for ROOT\CIMV2 dialog box closes and the WMI Control (Local) Properties dialog box is displayed.

8. On the **Security** page, click **Root** and then **Virtualization**, and then select **Virtualization**.



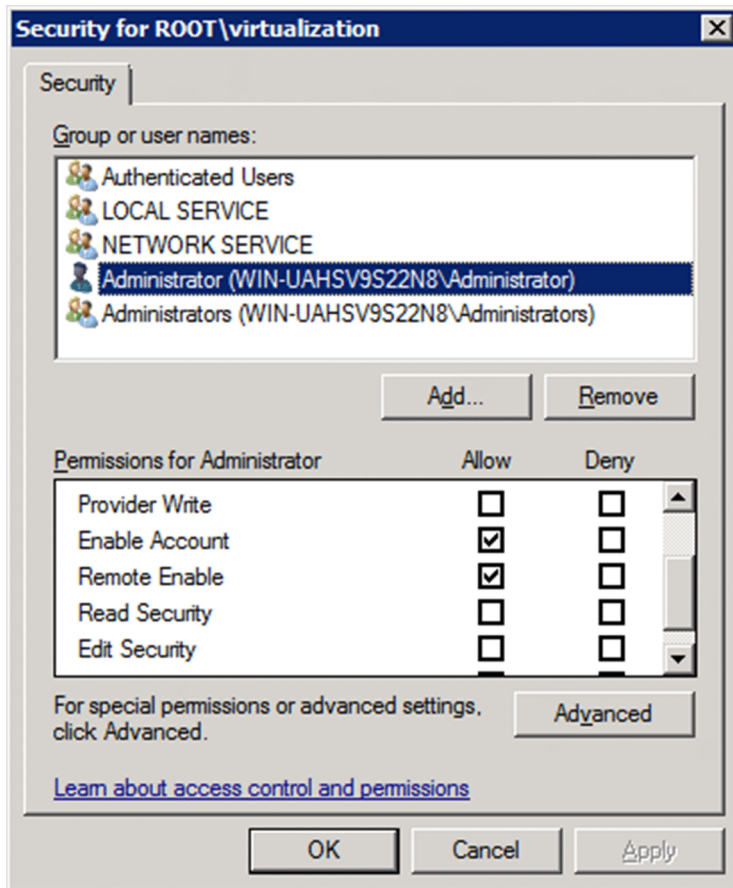
9. Click the **Security** button.

The Security for ROOT\virtualization dialog box is displayed.

Check if the user who connects to the monitored host or the group to which this user belongs is displayed in **Group or user names**. If the user or its group is not displayed, click the **Add** button and add the user or the group.

10. In **Group or user names**, select the user that connects to the monitored host or the group to which this user belongs.

Check if the check boxes for **Allow** are selected for **Enable Account** and **Remote Enable**. If these check box are cleared, select them.



11. Click the **OK** button.

The Security for ROOT\virtualization dialog box closes and the WMI Control (Local) Properties dialog box is displayed.

12. Click the **OK** button.

The WMI Control (Local) Properties dialog box closes.

13. In the wmicmgmt - [Console Root\WMI Control (Local)] window, from the **File** menu, choose **Exit** to close the window.

## (2) Checking the WMI connection status

Use the `wbemtest.exe` Windows tool to check if the PFM - RM host is connected to the monitored host.

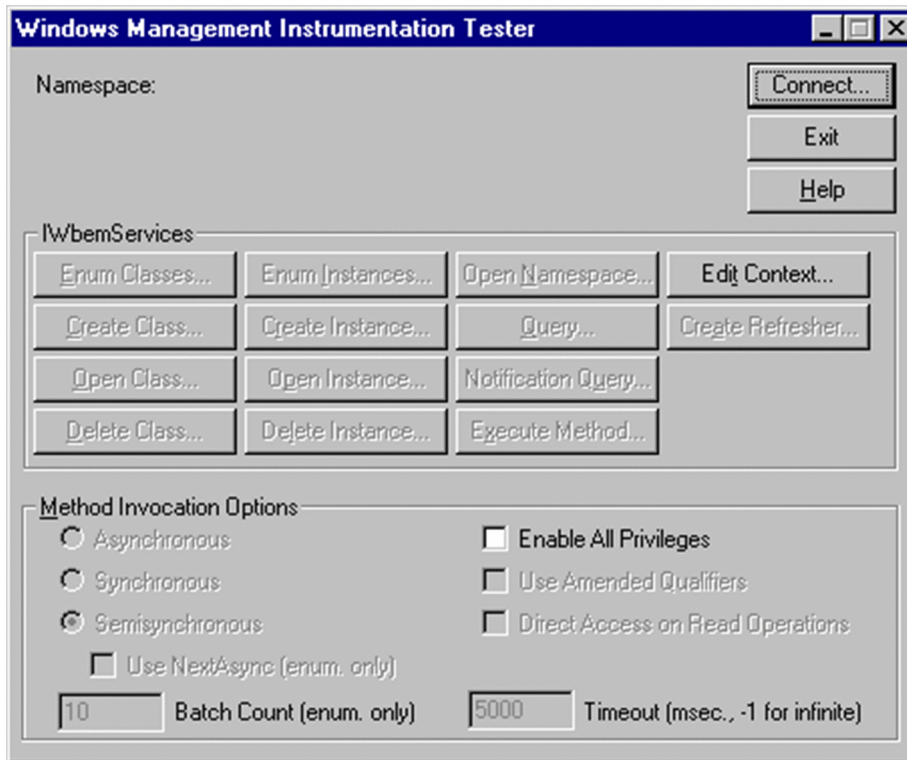
To check the WMI connection status (perform this procedure on the PFM - RM host):

1. At the command prompt, execute the following command:

```
runas /user:user-name wbemtest
```

If you specify a user who belongs to a domain, specify the user name in *user-name@domain-name* format.

The Windows Management Instrumentation Tester window appears.



Make sure that, for the user name, you specify the same value that is specified for `HostUserID` and `HostDomain` during setup of the instance environment. When the command prompts you to enter a password, specify the same value that is specified for `HostPassword`.

For details about **HostUserID**, **HostDomain**, and **HostPassword**, see Table 2-5.

2. Click the **Connect** button.

The Connect dialog box is displayed.

The image shows a 'Connect' dialog box with the following sections:

- Namespace:** A text box containing 'root\default'.
- Connection:**
  - Using: A dropdown menu showing 'IwbemLocator (Namespaces)'.
  - Returning: A dropdown menu showing 'IwbemServices'.
  - Completion: A dropdown menu showing 'Synchronous'.
- Credentials:**
  - User: A text box.
  - Password: A text box.
  - Authority: A text box.
- Locale:** A text box.
- How to interpret empty password:**
  - ☒ NULL
  - ☐ Blank
- Impersonation level:**
  - ☐ Identify
  - ☒ Impersonate
  - ☐ Delegate
- Authentication level:**
  - ☐ None
  - ☒ Packet
  - ☐ Connection
  - ☐ Packet integrity
  - ☐ Call
  - ☐ Packet privacy

Buttons: 'Connect' and 'Cancel'.

3. Enter appropriate information in **Namespace**, **User**, **Password**, and **Authority**.

The following explains the information to be entered:

- **Namespace**

Enter `\\monitored-host-name\root\cimv2` or `\\monitored-host-name\root\virtualization`. For *monitored-host-name*, specify the value that is set for **Target\_Host** in the monitoring target settings.

- **User**

Enter the user name used to log on to the monitored host. For this user name, specify the value set for **UserID** in the monitoring target settings.

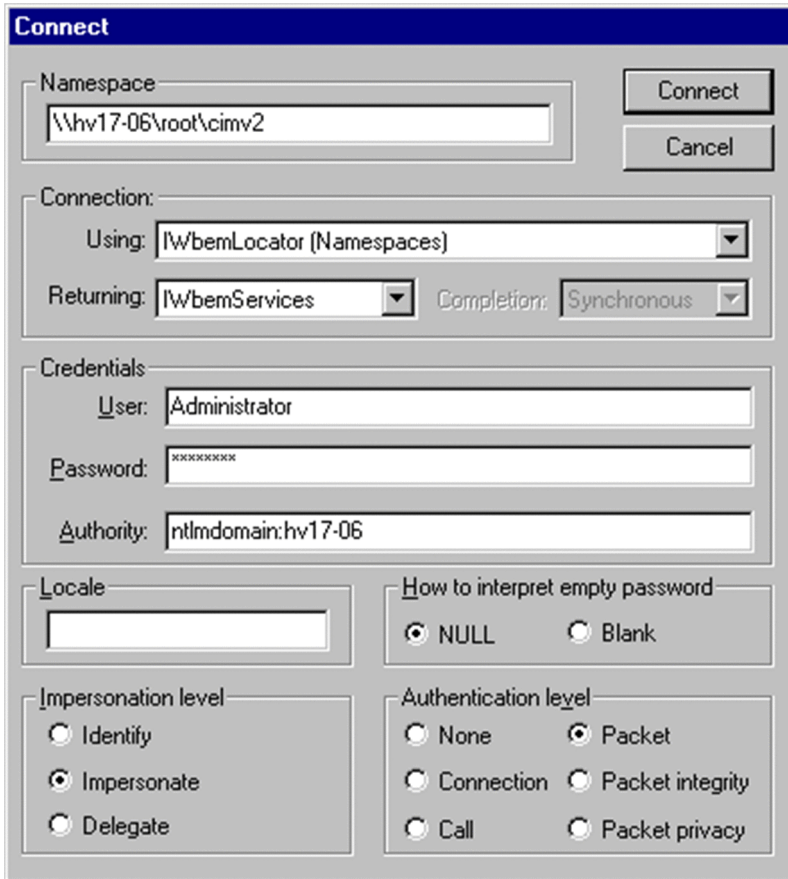
- **Password**

Enter the user's password. For the user password, specify the value set for **Password** in the monitoring target settings.

- **Authority**

Enter `ntlmdomain:monitored-host's-domain-name`. If the monitored host is a work group, leave this item blank. For the domain name of the monitored host, specify the value set for **Domain** in the monitoring target settings.

The following shows an example:



**Connect**

Namespace:  Connect Cancel

Connection:

Using:  ▼

Returning:  ▼ Completion:  ▼

Credentials:

User:

Password:

Authority:

Locale:

How to interpret empty password:

☒ NULL ☐ Blank

Impersonation level:

☐ Identify

☒ Impersonate

☐ Delegate

Authentication level:

☐ None ☒ Packet

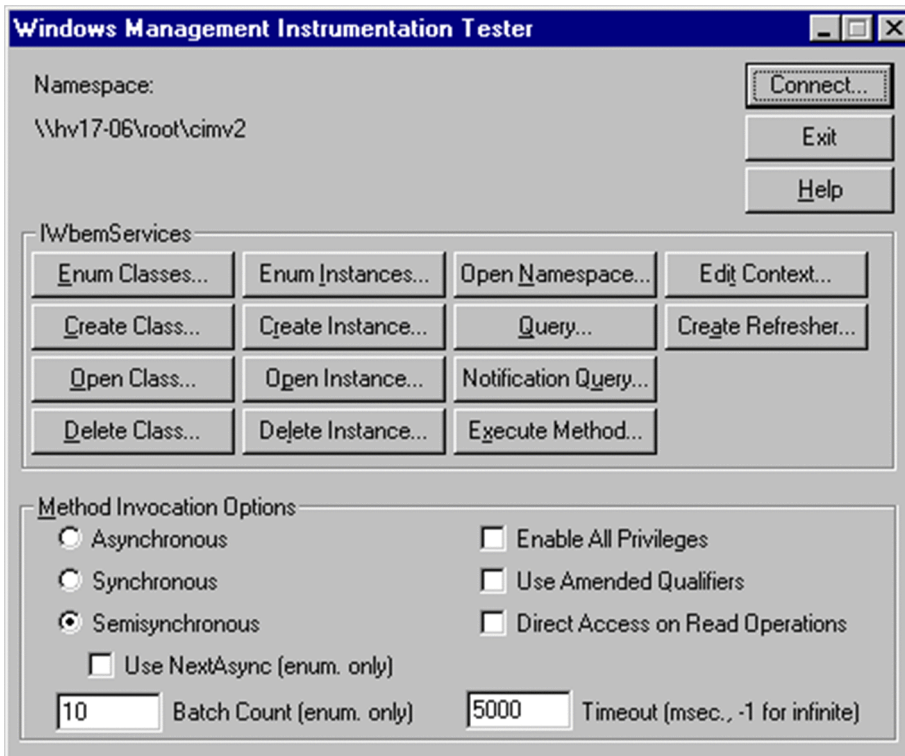
☐ Connection ☐ Packet integrity

☐ Call ☐ Packet privacy

For details about **Target\_Host**, **UserID**, **Password**, and **Domain**, see Table 2-8.

#### 4. Click the **Connect** button.

If connection is established successfully, the Connect dialog box closes and all the buttons in the Windows Management Instrumentation Tester dialog box are enabled.



**Windows Management Instrumentation Tester** [-] [ ] [X]

Namespace:  Connect... Exit Help

IWbemServices:

|                                                                              |                                                                                 |                                                                                    |                                                                                  |
|------------------------------------------------------------------------------|---------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| <input type="button" value="Enum Classes..."/> | <input type="button" value="Enum Instances..."/>  | <input type="button" value="Open Namespace..."/>     | <input type="button" value="Edit Context..."/>     |
| <input type="button" value="Create Class..."/> | <input type="button" value="Create Instance..."/> | <input type="button" value="Query..."/>              | <input type="button" value="Create Refresher..."/> |
| <input type="button" value="Open Class..."/>   | <input type="button" value="Open Instance..."/>   | <input type="button" value="Notification Query..."/> |                                                                                  |
| <input type="button" value="Delete Class..."/> | <input type="button" value="Delete Instance..."/> | <input type="button" value="Execute Method..."/>     |                                                                                  |

Method Invocation Options:

☐ Asynchronous ☐ Enable All Privileges

☐ Synchronous ☐ Use Amended Qualifiers

☒ Semisynchronous ☐ Direct Access on Read Operations

☐ Use NextAsync (enum. only)

Batch Count (enum. only)  Timeout (msec., -1 for infinite)

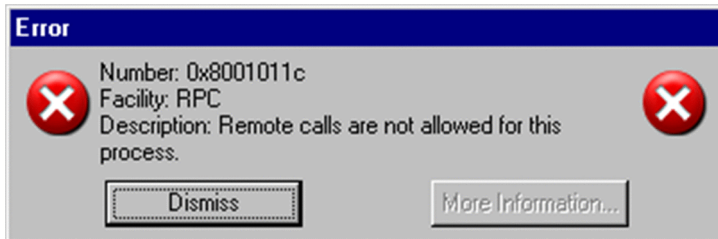


If an error dialog box is displayed, check the settings on the basis of the displayed error number. The error numbers and their causes are listed below.

Note that if you change settings while the `wbemtest.exe` tool is running, an error might result when you retry connection establishment. If this happens, restart the tool and then retry establishing connection.

- 0x8001011c

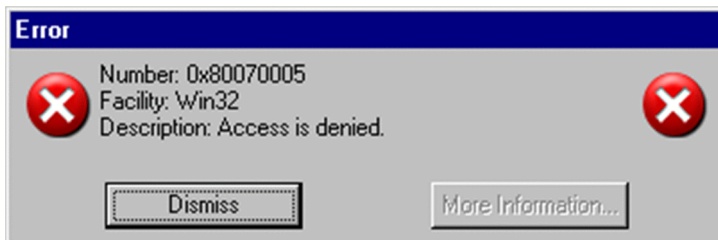
DCOM has not been set up on the PFM - RM host.



- 0x80070005

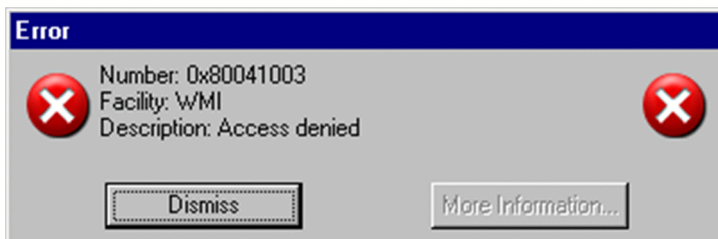
Possible causes are as follows:

- DCOM has not been set up on the PFM - RM host.
- DCOM has not been set up on the monitored host.
- The user name, password, or domain name used to connect to the monitored host is invalid.



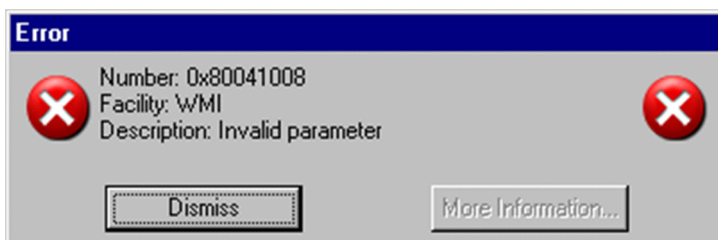
- 0x80041003

On the monitored host, **Namespace** has not been set for WMI.



- 0x80041008

The value specified in **Authority** does not begin with `ntlm domain:`.



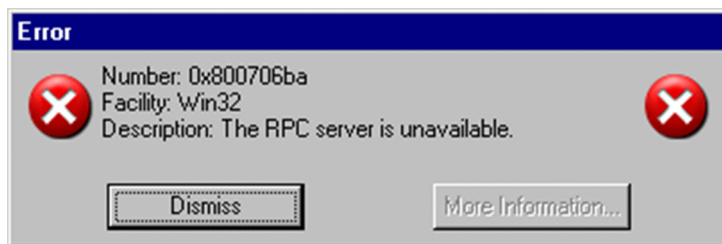
- 0x800706XX

Possible causes are as follows:

- The monitored host name is invalid.



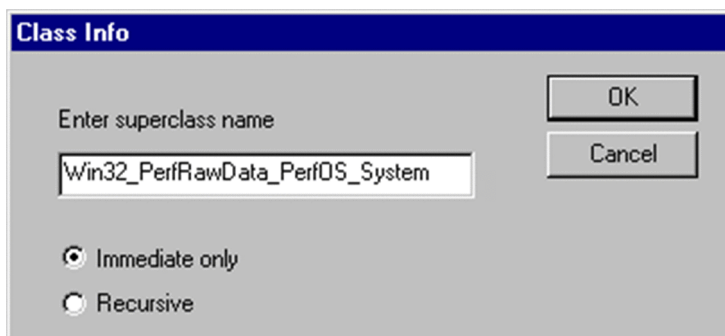
- The monitored host is not running.
- A firewall has not been set up on the monitored host.
- The password for the user logging on to the monitored host has expired.



5. Click the **Enum Instances** button.

The Class Info dialog box is displayed.

6. In **Enter superclass name**, enter `Win32_PerfRawData_PerfOS_System`, and then click the **OK** button.

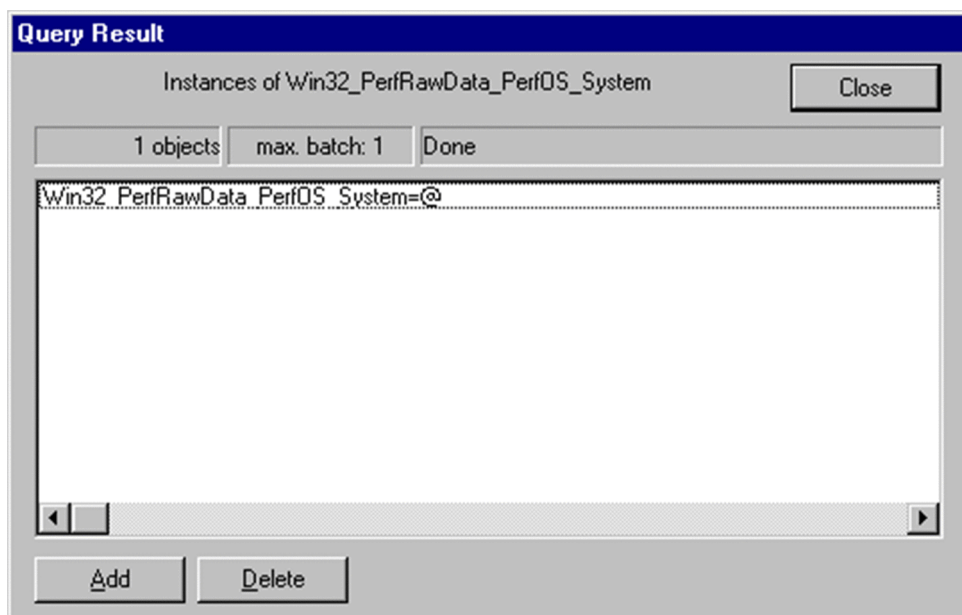


The Query Result dialog box is displayed.

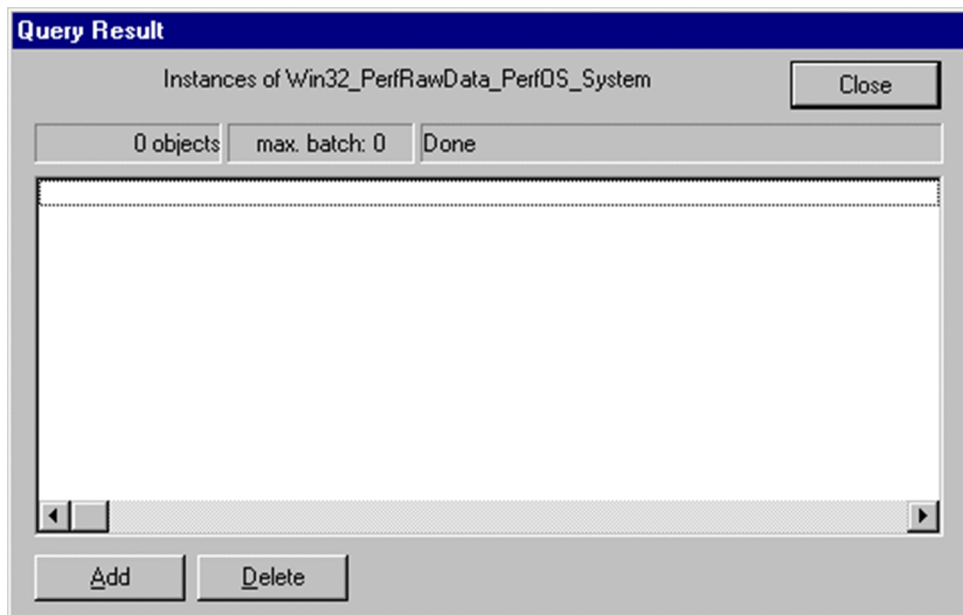
Check if the list contains the entry `Win32_PerfRawData_PerfOS_System=@`. If it doesn't or an error dialog box is displayed, the user who connects to the monitored host may not have the permission to access.

Note that if you change settings while the `wbemtest.exe` tool is running, an error might result when you retry instance enumeration. If this happens, restart the tool and then check again.

When the result is normal:



When the result is an error:

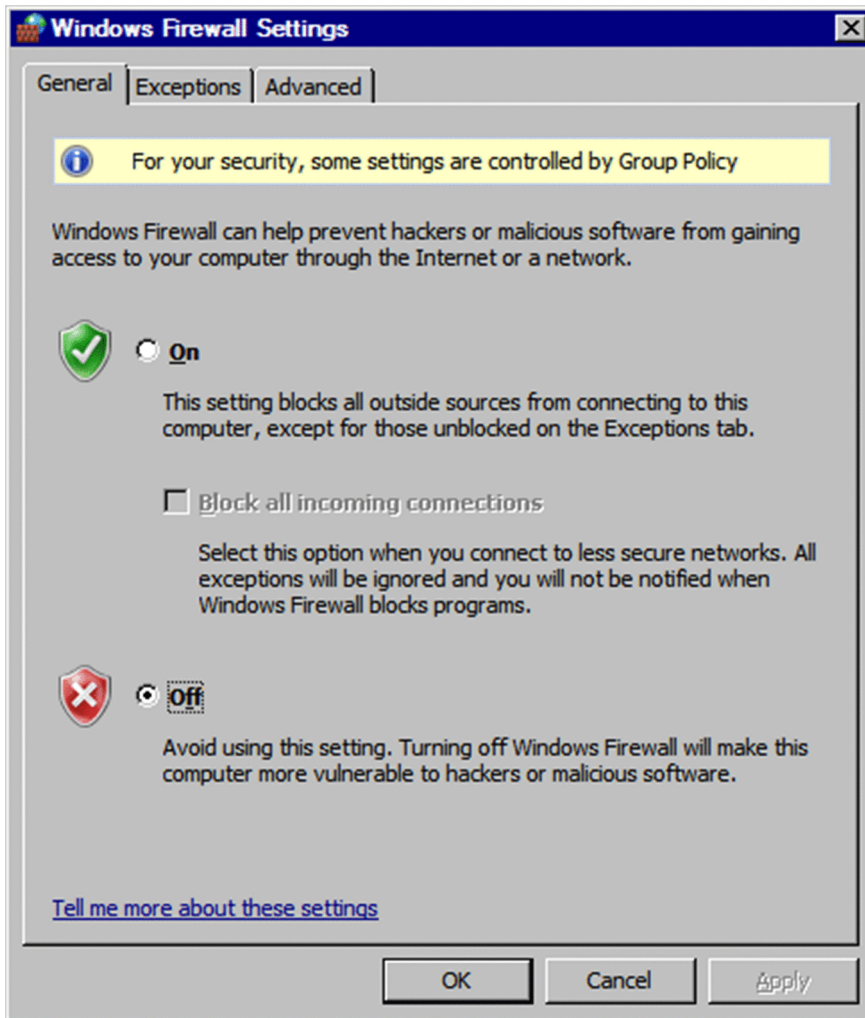


### (3) Checking the Windows firewall settings

Check if the Windows firewall is enabled or disabled.

In Windows, from the **Start** menu, choose **Control Panel**, and then **Windows Firewall** to display the Windows Firewall window. You can check the settings in this window.

The following figure shows an example in which the Windows firewall is disabled.



## 2.5.3 For KVM

If the virtual environment of a monitoring-target host uses KVM, PFM - RM for Virtual Machine uses SSH to collect performance data from that host. Before SSH can be used, PuTTY must be installed on the PFM - RM host. If SSH connection settings are not specified, PFM - RM for Virtual Machine will not be able to collect performance data. The settings for public key authentication must also be specified because public key authentication is used to authenticate the SSH server. In addition, because performance data is collected by using OS commands, necessary software and RPM packages might need to be installed on the PFM - RM host and the monitoring-target host.

Notes on installing PuTTY:

- Perform installation as a member of the Administrators group.
- Make sure that the name of the installation folder does not include multi-byte characters.

### (1) User account settings

To use SSH, accounts of both the PFM - RM host and the monitoring-target host are required.

- PFM - RM host account

Set values that are described as `HostUserID`, `HostPassword`, and `HostDomain` in Table 2-5. The account that is set is specified during instance setup.

If you use PFM - RM for Virtual Machine in a cluster system, specify the same user name and password on the executing and standby nodes. This will let the account logon to both of these nodes.

- Monitoring-target host account  
Use superuser as the monitoring-target host account.

## (2) Installing necessary software and RPM packages

### (a) Software required on the PFM - RM host

The table below lists the software that is required for PFM - RM for Virtual Machine to acquire KVM information. For details, see the *Release Notes*.

Table 2–16: Software required to acquire KVM information

| Software name | OS                           | Version                                                                   | Default |
|---------------|------------------------------|---------------------------------------------------------------------------|---------|
| PuTTY         | Windows Server<br>2003 (x86) | - Plink 0.60 or later<br>- PuTTYgen 0.60 or later<br>- Pscp 0.60 or later | N       |
|               | Windows Server<br>2003 (x64) | - Plink 0.60 or later<br>- PuTTYgen 0.60 or later<br>- Pscp 0.60 or later | N       |
|               | Windows Server<br>2008 (x86) | - Plink 0.60 or later<br>- PuTTYgen 0.60 or later<br>- Pscp 0.60 or later | N       |
|               | Windows Server<br>2008 (x64) | - Plink 0.60 or later<br>- PuTTYgen 0.60 or later<br>- Pscp 0.60 or later | N       |
|               | Windows Server<br>2012       | - Plink 0.62 or later<br>- PuTTYgen 0.62 or later<br>- Pscp 0.62 or later | N       |

Legend:

N: Not installed by default.

### (b) RPM packages required on the monitoring-target host

In order for PFM - RM for Virtual Machine to acquire KVM information, the RPM packages listed below are required.

| Software name | OS                                            | RPM package name                                                      | Default |
|---------------|-----------------------------------------------|-----------------------------------------------------------------------|---------|
| OpenSSH       | Red Hat Enterprise<br>Linux 6 (64-bit x86_64) | openssh-5.3p1-20.el6 or later<br>openssh-server-5.3p1-20.el6 or later | Y       |

Legend:

Y: Installed by default.

### (c) Packages and commands required on the monitoring-target host

The command required for record collection differs depending on the record to be collected, and the required RPM package also differs depending on the command. To check the required package for a command, execute the following:

```
/bin/rpm -qf full-path-name-of-the-prerequisite-command
```

## (d) Records and the commands required for collecting the records

The following table lists records and the commands that are required for collecting the records.

Table 2–17: Records and the commands required for collecting the records

| No. | Record                                 | Command                                                                      |
|-----|----------------------------------------|------------------------------------------------------------------------------|
| 1   | Host CPU Status<br>(PI_HCI)            | /bin/date<br>/bin/cat                                                        |
| 2   | Host Logical Disk Status<br>(PI_HLDI)  | /bin/date<br>/bin/df                                                         |
| 3   | Host Memory Status<br>(PI_HMI)         | /bin/date<br>/bin/ps<br>/usr/bin/free<br>/usr/bin/getconf<br>/usr/bin/vmstat |
| 4   | Host Network Status<br>(PI_HNI)        | /bin/date<br>/sbin/ifconfig<br>/usr/bin/virsh                                |
| 5   | Host Physical Disk Status<br>(PI_HPDI) | /bin/date<br>/usr/bin/iostat                                                 |
| 6   | Host Status Detail<br>(PD)             | /usr/bin/virsh                                                               |
| 7   | Host Status<br>(PI)                    | /bin/date<br>/bin/cat<br>/bin/ps<br>/usr/bin/top                             |
| 8   | VM CPU Status<br>(PI_VCI)              | /bin/date<br>/usr/bin/virsh                                                  |
| 9   | VM Logical Disk Status<br>(PI_VLDI)    | --                                                                           |
| 10  | VM Memory Status<br>(PI_VMI)           | /bin/date<br>/usr/bin/pmap<br>/usr/bin/virsh                                 |
| 11  | VM Network Status<br>(PI_VNI)          | /bin/date<br>/sbin/ifconfig<br>/usr/bin/virsh                                |
| 12  | VM Physical Disk Status<br>(PI_VPDI)   | /bin/date<br>/usr/bin/virsh                                                  |
| 13  | VM Status Detail<br>(PD_VM)            | /usr/bin/virsh                                                               |
| 14  | VM Status<br>(PI_VI)                   | /bin/date<br>/usr/bin/virsh<br>/bin/ps<br>/usr/bin/top                       |

The following lists the RPM packages required by the commands that are required for record collection.

**Table 2–18: RPM packages required by the commands that are required for record collection**

| No. | Command name     | Package name                         | Default |
|-----|------------------|--------------------------------------|---------|
| 1   | /bin/cat         | coreutils-8.4-13.el6 or later        | Y       |
| 2   | /bin/date        | coreutils-8.4-13.el6 or later        | Y       |
| 3   | /bin/df          | coreutils-8.4-13.el6 or later        | Y       |
| 4   | /bin/ps          | procps-3.2.8-17.el6 or later         | Y       |
| 5   | /usr/bin/free    | procps-3.2.8-17.el6 or later         | Y       |
| 6   | /usr/bin/getconf | glibc-common-2.12-1.25.el6 or later  | Y       |
| 7   | /usr/bin/iostat  | sysstat-9.0.4-18.el6 or later        | N       |
| 8   | /usr/bin/pmap    | procps-3.2.8-17.el6 or later         | Y       |
| 9   | /usr/bin/top     | procps-3.2.8-17.el6 or later         | Y       |
| 10  | /usr/bin/virsh   | libvirt-client-0.8.7-18.el6 or later | N       |
| 11  | /usr/bin/vmstat  | procps-3.2.8-17.el6 or later         | Y       |
| 12  | /sbin/ifconfig   | net-tools-1.60-105.el6 or later      | Y       |

Legend:

Y: Installed by default.

N: Not installed by default.

### (3) Settings related to SSH connection

The settings that enable SSH connection must be specified on both the PFM - RM host and the monitoring-target host. The following describe the procedures for specifying these settings.

#### (a) Enabling public key authentication of the SSH server

To enable public key authentication:

1. Log in to the monitoring-target host as the superuser.
2. Open the /etc/ssh/sshd\_config file.
3. Change the value of PubkeyAuthentication to yes.
4. Change the value of PermitRootLogin to yes.
5. Save and close the /etc/ssh/sshd\_config file.
6. Restart the sshd service by executing the command shown below.

Note that the command below assumes that the host named targethost1 is set as a monitoring target.

```
[root@targethost1.ssh]$ /etc/rc.d/init.d/sshd restart
```

## Important note

To allow the superuser to collect information, open the `/etc/ssh/sshd_config` file, and change the value of `PermitRootLogin` to `yes`. Then, restart the `sshd` service.

## (b) Creating keys

The procedure for creating keys is described below.

Keys can be created by logging on to the PFM - RM host, and then by executing PuTTY. Either of two types of keys (for RSA encryption and DSA encryption) can be selected. Because the only difference between two key types is the encryption algorithm, key usage is the same, whichever type is selected. In this subsection, the procedure for creating RSA keys is described. To create RSA keys:

1. From the Windows **Start** menu, select **Programs, PuTTY**, and then **PuTTYgen**.  
PuTTYgen starts, and the PuTTY Key Generator window appears.
2. Under **Parameters**, confirm that **Type of key to generate** is **SSH-2 RSA**, and then click the **Generate** button.  
The key generation progress bar appears in **Key**.  
Because PuTTY uses the version 2 of the SSH protocol by default, **SSH-2 RSA** is selected. However, you might want to change the protocol version to 1. For details about how to change the protocol version to 1, see the PuTTY documentation.
3. Irregularly move the mouse pointer in the dialog box until the progress reaches 100%.  
When the progress reaches 100%, the created random number is displayed in **Key**, and keys are created.
4. Click the **Save private key** button to save a private key.  
If no values are entered in **Key passphrase** and **Confirm passphrase**, a dialog box appears. In this dialog box, click the **Yes** button without entering anything in **Key passphrase** and **Confirm passphrase**.
5. Click the **Save public key** button to save a public key.

## (c) Deploying the public key (PFM - RM host)

If there are multiple monitoring-target hosts, perform the following procedure on all of the hosts.

### ■ Transfer the public key

Transfer the public key to the `.ssh` directory under the home directory on a monitoring-target host. To do this:

1. Log in to the monitoring-target host as the superuser (account specified for `UserID` during setup of the monitoring target).
2. Use the `cd` command to move to the `.ssh` directory under the home directory.  
If the `.ssh` directory does not exist under the home directory, create the `.ssh` directory. For the access permission attribute of the `.ssh` directory, set 700 or 755. For the owner and group, set values that are appropriate for the user specified during setup of the monitoring-target host.  
If the home directory, `.ssh` directory attribute, owner, and group settings are not correct, SSH connection might fail.  
For details about how to set the directory attribute, see the OS documentation.
3. On the PFM - RM host, open the Command Prompt window, and then move to the folder in which PuTTY is installed.

#### 4. Execute the pscp command (provided by PuTTY).

An example of executing the command is shown below. This example assumes that the public key is located in the PuTTY installation directory and a host named targethost1 is set as a monitoring target.

```
C:\Program Files\PuTTY>pscp.exe agt8.pub root@targethost1:.ssh
root@targethost1's password: (Enter the superuser's password here.)
agt8.pub | 0 kB | 0.3 kB/s | ETA: 00:00:00 | 100%
C:\Program Files\PuTTY>
```

If a message asking you whether you want to register the fingerprint appears, enter n.

```
C:\Program Files\PuTTY>pscp.exe agt8.pub root @targethost1:.ssh
The server's host key is not cached in the registry. You have no
guarantee that the server is the computer you think it is.
The server's rsa2 key fingerprint is:
ssh-rsa 2048 xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx
If you trust this host, enter "y" to add the key to PuTTY's cache and
carry on connecting.
If you want to carry on connecting just once, without adding the key to
the cache, enter "n".
If you do not trust this host, press Return to abandon the connection.
Store key in cache? (y/n) n
Using keyboard-interactive authentication.
Password: (Enter the superuser's password here.)
agt8.pub | 0 kB | 0.3 kB/s | ETA: 00:00:00 | 100%
C:\Program Files\PuTTY>
```

#### ■ Registering the public key (monitoring-target host)

Log in to the monitoring-target host as the superuser that was set during setup of the monitoring target (account specified for UserID), and then register the public key. To do this:

1. Log in to the monitoring-target host as the superuser that was set during setup of the monitoring target.
2. Use the `cd` command to move to the `.ssh` directory.
3. Execute the `ssh-keygen` command with the `-i` and `-f` options specified.  
The public key created by PuTTY is converted so that the key can be used for OpenSSH.
4. Use the `rm` command to delete the public key file that was received by the procedure in *Transferring the public key*.
5. Execute the `chmod` command to change the attribute of the key authentication file to 600.

The following shows an example of executing the commands in steps 2 through 5:

```
[root @targethost1 ~]$ cd .ssh
[root @targethost1 .ssh]$ ssh-keygen -i -f agt8.pub >> authorized_keys
[root @targethost1 .ssh]$ rm agt8.pub
[root @targethost1 .ssh]$ chmod 600 authorized_keys
```

The name of the key authentication file is set by `AuthorizedKeysFile` in the `/etc/ssh/sshd_config` file.

By default, `~/.ssh/authorized_keys` is set.



## (d) Confirming connectivity and registering the fingerprint (PFM - RM host)

To confirm connectivity and register the fingerprint:

1. Log in to the PFM - RM host.  
Make sure that you use the account that was set for `HostUserID` during setup of the instance environment.
2. Open the Command Prompt window.
3. Execute the PuTTY `plink` command using the private key that has been created.  
Connection is attempted.
4. Upon achieving the initial connection, register the fingerprint.  
Enter `y` to register the fingerprint of the public key on the monitoring-target host.  
When `y` is entered, the prompt of the monitoring-target host is displayed.
5. Log out.  
When the prompt of the monitoring-target host is displayed, enter `exit` to log out from the host.
6. Execute the PuTTY `plink` command to reconnect to the monitoring-target host.  
If you are not prompted to enter anything and reconnection succeeds, the connection settings are completed. Enter `exit` to log out from the monitoring-target host.  
If an error occurs or you are prompted to enter something, check for problems with operations performed by the procedure.

The following shows an example of performing the procedure for checking connectivity:

```
C:\WINDOWS\system32>"C:\Program Files\PuTTY\plink.exe" -ssh -noagent -i "C:\Program Files\PuTTY\agt8.ppk" -l root -P 22 targethost1
The server's host key is not cached in the registry. You have no guarantee
that the server is the computer you think it is.
The server's rsa2 key fingerprint is:
ssh-rsa 2048 xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx
If you trust this host, enter "y" to add the key to PuTTY's cache and carry
on connecting.
If you want to carry on connecting just once, without adding the key to the
cache, enter "n".
If you do not trust this host, press Return to abandon the connection.
Store key in cache? (y/n) y
Using username "root".
Last login: Wed Aug  4 13:29:55 2010 from xxx.xxx.xxx.xxx
[root@targethost1]$ exit
logout
C:\WINDOWS\system32>"C:\Program Files\PuTTY\plink.exe" -ssh -noagent -i "C:\Program Files\PuTTY\agt8.ppk" -l root -P 22 targethost1
Using username "root".
Last login: Wed Aug  4 13:30:00 2010 from xxx.xxx.xxx.xxx
[root@targethost1]$ exit
logout
C:\WINDOWS\system32>
```



### Important note

PFM - RM for Virtual Machine assumes that fingerprint authentication has already finished. If the fingerprint has not yet been registered before PFM - RM for Virtual Machine connects to the SSH client for the first time, always register the fingerprint at the initial connection.

In a cluster environment, make sure that you also check connectivity and register the fingerprint on the standby node.

## 2.6 Examples of setting up an instance environment and monitoring targets

This section provides examples of setting up an instance environment and monitoring targets to monitor a VMware environment.

### 2.6.1 For VMware

This subsection provides an example of setting up an instance environment to monitor VMware.

#### (1) Assumed VMware environment

The explanation in this subsection assumes that the user has the following VMware environment:

##### *Monitored host*

- Virtual environment software: VMware ESX Server
- Physical server host name: vm-host
- Login user name#: user01
- Login password#: pass01
- Domain name: None

#  
The user must be able to connect to VMware ESX Server from a management tool such as VMware Infrastructure Client

##### *PFM - RM host*

- OS: Windows Server 2003
- Login user name: vmuser
- Login password: vmpass
- Domain name: vmdomain

#### (2) Example of setting up an instance environment

A command execution example for setting up an instance environment follows.

```
C:\Program Files\Hitachi\jplpc\tools>jpcconf inst setup -key RMVM -inst
vmware1 ...1
VM_Type [vmware] :<Enter> ...2
Interval [300] :<Enter> ...3
Std_Category [Y] :<Enter> ...4
Cpu_Category [Y] :<Enter> ...5
Memory_Category [Y] :<Enter> ...6
Disk_Category [Y] :<Enter> ...7
Network_Category [Y] :<Enter> ...8
HostUserID [] :vmuser<Enter> ...9
HostPassword [] :vmpass<Enter> ...10
Re-enter :vmpass<Enter>
HostDomain [] :vmdomain<Enter> ...11
```

```

SSH_Client      []           :<Enter>          ...12
Log_Size (MB)   [16]        :<Enter>          ...13
UseVcpuMax      [N]         :<Enter>          ...14
KAVE05080-I Creating an instance environment. (servicekey=RMVM,
inst=vmware1)
KAVE05081-I An instance environment has been created. (servicekey=RMVM,
inst=vmware1)

```

#### Legend:

<Enter>: **Enter** key must be pressed.

*I* through *I4*: Number of the corresponding step in the setup procedure.

To set up an instance environment:

1. Execute the `jpccconf inst setup` command.  
Specify any name as the instance name.
2. Set up `VM_Type`.  
Since the default value (`vmware`) will be used, press the **Enter** key without entering any value.
3. Set up `Interval`.  
Since the default value (300) will be used, press the **Enter** key without entering any value.
4. Set up `Std_Category`.  
Since the default value (Y) will be used, press the **Enter** key without entering any value.
5. Set up `Cpu_Category`.  
Since the default value (Y) will be used, press the **Enter** key without entering any value.
6. Set up `Memory_Category`.  
Since the default value (Y) will be used, press the **Enter** key without entering any value.
7. Set up `Disk_Category`.  
Since the default value (Y) will be used, press the **Enter** key without entering any value.
8. Set up `Network_Category`.  
Since the default value (Y) will be used, press the **Enter** key without entering any value.
9. Set up `HostUserID`.  
Enter the PFM - RM host's `vmuser` user name to be used for connection and press the **Enter** key.
10. Set up `HostPassword`.  
Enter `vmpass` as the password for the user ID set by `HostUserID`, and then press the **Enter** key. The system will ask you to re-enter the password for confirmation purposes. Re-enter the `vmpass` password and then press the **Enter** key.  
*Note:*  
The entered character strings are not displayed on the screen.
11. Set up `HostDomain`.  
Enter `vmdomain` as the name of the domain that the PFM - RM host belongs to, and then press the **Enter** key.

## 12. Set up SSH\_Client.

Press the **Enter** key without entering any value because this item is not used by VMware.

## 13. Set up Log\_Size.

Since the default value (16 megabytes) will be used, press the **Enter** key without entering any value.

## 14. Set up UseVcpuMax.

Since the default value (N) will be used, press the **Enter** key without entering any value.

# (3) Example of setting up monitoring targets

The following shows an example of executing a command to set up a monitoring target.

```
C:\Program Files\Hitachi\jplpc\tools>jpcconf target setup -key RMVM -inst
vmware1 -target vm-host ...1
Target Host      []          :vm-host <Enter>          ...2
VM_Host          []          :<Enter>              ...3
Security         [1]        :<Enter>              ...4
Port             [0]        :<Enter>              ...5
UserID           []          :user01<Enter>       ...6
Password         []          :pass01<Enter>       ...7
                  Re-enter  :pass01<Enter>
Domain           []          :<Enter>              ...8
Private_Key_File []          :<Enter>              ...9
KAVE05361-I The monitoring target is now being added. (servicekey=RMVM,
inst=vmware1, target=vm-host)
KAVE05362-I The monitoring target has been added. (servicekey=RMVM,
inst=vmware1, target=vm-host)
```

### Legend:

<Enter>: **Enter** key must be pressed.

*1* through *9*: Number of the corresponding step in the setup procedure.

To set up a monitoring target (as in the above example):

### 1. Execute the jpcconf target setup command.

Specify vm-host, which is the host name of a physical server, as the name of a monitoring target.

### 2. Set Target Host.

Enter vm-host, which is the host name of a physical server, and then press the **Enter** key.

### 3. Set VM\_Host.

Since the Target Host value will be used, press the **Enter** key without entering any value.

### 4. Set Security.

Since the default value (1) will be used, press the **Enter** key without entering any value.

### 5. Set Port.

Since the default value (0) will be used, press the **Enter** key without entering any value.

### 6. Set UserID.

Enter user01 as the user name that is used for connection, and then press the **Enter** key.

## 7. Set Password.

Enter `pass01` as the password that is used for connection, and then press the **Enter** key. When you are prompted to enter the same password again, re-enter `pass01`, and then press the **Enter** key.

*Note:*

The password string that you enter is not displayed.

## 8. Set Domain.

Press the **Enter** key without entering any value because this item is not used by VMware.

## 9. Set Private\_Key\_File.

Press the **Enter** key without entering any value because this item is not used by VMware.

## 2.6.2 For Hyper-V

This subsection provides an example of setting up an instance environment to monitor Hyper-V.

### (1) Assumed Hyper-V environment

The explanation in this subsection assumes that the user has the following Hyper-V environment:

*Monitored host*

- Virtual environment software: Hyper-V
- Physical server host name: `vm-host`
- Login user name: `user01`
- Login password: `pass01`
- Domain name: `domain01`

*PFM - RM host*

- Login user name: `vmuser`
- Login password: `vmpass`
- Domain name: `vmdomain`

### (2) Example of setting up an instance environment

A command execution example for setting up an instance environment follows.

```
C:\Program Files\Hitachi\jplpc\tools>jpccnf inst setup -key RMVM -inst
hyperv1      ...1
VM_Type      [vmware]      :hyperv<Enter>      ...2
Interval     [300]        :<Enter>          ...3
Std_Category [Y]          :<Enter>          ...4
Cpu_Category [Y]          :<Enter>          ...5
Memory_Category [Y]       :<Enter>          ...6
Disk_Category [Y]         :<Enter>          ...7
Network_Category [Y]      :<Enter>          ...8
HostUserID    []          :vmuser<Enter>    ...9
HostPassword  []          :vmpass<Enter>   ...10
Re-enter     :vmpass<Enter>
```

```

HostDomain      []          :vmdomain<Enter>      ...11
SSH_Client      []          :<Enter>        ...12
Log_Size (MB)   [16]       :<Enter>        ...13
UseVcpuMax      [N]        :<Enter>        ...14
KAVE05080-I Creating an instance environment. (servicekey=RMVM,
inst=hyperv1)
KAVE05081-I An instance environment has been created. (servicekey=RMVM,
inst=hyperv1)

```

#### Legend:

<Enter>: **Enter** key must be pressed.

*I* through *14*: Number of the corresponding step in the setup procedure.

To set up an instance environment:

1. Execute the `jpccconf inst setup` command.  
Specify any name as the instance name.
2. Set up `VM_Type`.  
Enter `hyperv` and press the **Enter** key.
3. Set up `Interval`.  
Since the default value (300) will be used, press the **Enter** key without entering any value.
4. Set up `Std_Category`.  
Since the default value (Y) will be used, press the **Enter** key without entering any value.
5. Set up `Cpu_Category`.  
Since the default value (Y) will be used, press the **Enter** key without entering any value.
6. Set up `Memory_Category`.  
Since the default value (Y) will be used, press the **Enter** key without entering any value.
7. Set up `Disk_Category`.  
Since the default value (Y) will be used, press the **Enter** key without entering any value.
8. Set up `Network_Category`.  
Since the default value (Y) will be used, press the **Enter** key without entering any value.
9. Set up `HostUserID`.  
Enter the PFM - RM host's `vmuser` user name to be used for connection and press the **Enter** key.
10. Set up `HostPassword`.  
Enter `vmpass` as the password for the user ID set by `HostUserID`, and then press the **Enter** key. The system will ask you to re-enter the password for confirmation purposes. Re-enter `vmpass` and then press the **Enter** key.  
*Note:*  
The entered character strings are not displayed on the screen.
11. Set up `HostDomain`.  
Enter `vmdomain` as the name of the domain that the PFM - RM host belongs to, and then press the **Enter** key.

## 12. Set up SSH\_Client.

Press the **Enter** key without entering any value because this item is not used by Hyper-V.

## 13. Set up Log\_Size.

Since the default value (16 megabytes) will be used, press the **Enter** key without entering any value.

## 14. Set up UseVcpuMax.

Since the default value (N) will be used, press the **Enter** key without entering any value.

# (3) Example of setting up monitoring targets

The following shows an example of executing a command to set up a monitoring target.

```
C:\Program Files\Hitachi\jplpc\tools>jpcconf target setup -key RMVM -inst
hypervl -target vm-host      ...1
Target Host      []          :vm-host <Enter>      ...2
VM_Host          []          :<Enter>              ...3
Security         [1]         :<Enter>              ...4
Port             [0]         :<Enter>              ...5
UserID           []          :user01<Enter>        ...6
Password         []          :pass01<Enter>        ...7
                  Re-enter   :pass01<Enter>
Domain           []          :domain01<Enter>      ...8
Private_Key_File []          :<Enter>              ...9
KAVE05361-I The monitoring target is now being added. (servicekey=RMVM,
inst=hypervl, target=vm-host)
KAVE05362-I The monitoring target has been added. (servicekey=RMVM,
inst=hypervl, target=vm-host)
```

Legend:

<Enter>: **Enter** key must be pressed.

*1* through *9*: Number of the corresponding step in the setup procedure.

To set up a monitoring target (as in the above example):

### 1. Execute the jpcconf target setup command.

Specify vm-host, which is the host name of a physical server, as the name of a monitoring target.

### 2. Set Target Host.

Enter vm-host, which is the host name of a physical server, and then press the **Enter** key.

### 3. Set VM\_Host.

Since the Target Host value will be used, press the **Enter** key without entering any value.

### 4. Set Security.

Press the **Enter** key without entering any value because this item is not used by Hyper-V.

### 5. Set Port.

Press the **Enter** key without entering any value because this item is not used by Hyper-V.

### 6. Set UserID.

Enter user01 as the user name that is used for connection, and then press the **Enter** key.



### 7. Set Password.

Enter `pass01` as the password that is used for connection, and then press the **Enter** key. When you are prompted to enter the same password again, re-enter `pass01`, and then press the **Enter** key.

*Note:*

The password string that you enter is not displayed.

### 8. Set Domain.

Enter `domain01` as the domain name that is used for connection, and then press the **Enter** key.

### 9. Set Private\_Key\_File.

Press the **Enter** key without entering any value because this item is not used by Hyper-V.

## 2.6.3 For KVM

This subsection provides an example of setting up an instance environment to monitor KVM.

### (1) Assumed KVM environment

The explanation in this subsection assumes that the user has the following KVM environment:

#### *Monitored host*

- Virtual environment software: KVM
- Physical server host name: `vm-host`
- Login user name: `user01`
- Login password: None
- Domain name: None

#### *PFM - RM host*

- Login user name: `vmuser`
- Login password: `vmpass`
- Domain name: `vmdomain`
- SSH client: `C:\Program Files\PuTTY\plink.exe`
- Private key file: `C:\Program Files\PuTTY\agt8.ppk`

### (2) Example of setting up an instance environment

A command execution example for setting up an instance environment follows.

```
C:\Program Files\Hitachi\jplpc\tools>jpcconf inst setup -key RMVM -inst
kvm1      ...1
VM_Type           [vmware]           :kvm<Enter>           ...2
Interval          [300]              :<Enter>              ...3
Std_Category      [Y]                :<Enter>              ...4
Cpu_Category      [Y]                :<Enter>              ...5
Memory_Category   [Y]                :<Enter>              ...6
Disk_Category     [Y]                :<Enter>              ...7
Network_Category  [Y]                :<Enter>              ...8
```

```

HostUserID      []          :vmuser<Enter>      ...9
HostPassword    []          :vmpass<Enter>     ...10
                Re-enter   :vmpass<Enter>
HostDomain      []          :vmdomain<Enter>   ...11
SSH_Client      []          :C:\Program Files\PuTTY
\plink.exe<Enter>                ...12
Log_Size (MB)   [16]        :<Enter>              ...13
UseVcpuMax      [N]         :<Enter>              ...14
KAVE05080-I Creating an instance environment. (servicekey=RMVM, inst=kvm1)
KAVE05081-I An instance environment has been created. (servicekey=RMVM,
inst=kvm1)

```

#### Legend:

<Enter>: **Enter** key must be pressed.

*I* through *14*: Number of the corresponding step in the setup procedure.

To set up an instance environment:

1. Execute the `jpccconf inst setup` command.

Specify any name as the instance name.

2. Set up `VM_Type`.

Enter `kvm` and press the **Enter** key.

3. Set up `Interval`.

Since the default value (300) will be used, press the **Enter** key without entering any value.

4. Set up `Std_Category`.

Since the default value (Y) will be used, press the **Enter** key without entering any value.

5. Set up `Cpu_Category`.

Since the default value (Y) will be used, press the **Enter** key without entering any value.

6. Set up `Memory_Category`.

Since the default value (Y) will be used, press the **Enter** key without entering any value.

7. Set up `Disk_Category`.

Since the default value (Y) will be used, press the **Enter** key without entering any value.

8. Set up `Network_Category`.

Since the default value (Y) will be used, press the **Enter** key without entering any value.

9. Set `HostUserID`.

Enter `vmuser` as the PFM - RM host user name that is used for connection, and then press the **Enter** key.

10. Set up `HostPassword`.

Enter `vmpass` as the password for the user ID set by `HostUserID`, and then press the **Enter** key. The system will ask you to re-enter the password for confirmation purposes. Re-enter the `vmpass` password and then press the **Enter** key.

*Note:*

The entered character strings are not displayed on the screen.

#### 11. Set HostDomain.

Enter `vmdomain` as the name of the domain that the PFM - RM host belongs to, and then press the **Enter** key.

#### 12. Set up SSH\_Client.

Enter `C:\Program Files\PuTTY\plink.exe` as the executable file of the SSH command that is used for connection, and then press the **Enter** key.

#### 13. Set Log\_Size.

Since the default value (16 MB) will be used, press the **Enter** key without entering any value.

#### 14. Set up UseVcpuMax.

Press the **Enter** key without entering any value because this item is not used by KVM.

### (3) Example of setting up a monitoring target

The following shows an example of executing a command to set up a monitoring target.

```
C:\Program Files\Hitachi\jplpc\tools>jpcconf target setup -key RMVM -inst
kvm1 -target vm-host      ...1
Target Host      []          :vm-host <Enter>      ...2
VM_Host          []          :<Enter>          ...3
Security         [1]         :<Enter>          ...4
Port             [0]         :<Enter>          ...5
UserID           []          :user01<Enter>   ...6
Password         []          :<Enter>          ...7
Domain           []          :<Enter>          ...8
Private_Key_File []          :C:\Program Files\PuTTY
\agt8.ppk<Enter>   ...9
KAVE05361-I The monitoring target is now being added. (servicekey=RMVM,
inst=kvm1, target=vm-host)
KAVE05362-I The monitoring target has been added. (servicekey=RMVM,
inst=kvm1, target=vm-host)
```

#### Legend:

<Enter>: **Enter** key must be pressed.

/ through 9: Number of the corresponding step in the setup procedure.

To set up a monitoring target (as in the above example):

##### 1. Execute the `jpcconf target setup` command.

Specify `vm-host`, which is the host name of a physical server, as the name of a monitoring target.

##### 2. Set Target Host.

Enter `vm-host`, which is the host name of a physical server, and then press the **Enter** key.

##### 3. Set VM\_Host.

Since the Target Host value will be used, press the **Enter** key without entering any value.

##### 4. Set Security.

Press the **Enter** key without entering any value because this item is not used by KVM.

##### 5. Set Port.

Since the default value (0) will be used, press the **Enter** key without entering any value.

6. Set UserID.

Enter `user01` as the user name that is used for connection, and then press the **Enter** key.

7. Set Password.

Press the **Enter** key without entering any value because this item is not used by KVM.

8. Set Domain.

Press the **Enter** key without entering any value because this item is not used by KVM.

9. Set Private\_Key\_File.

Enter `C:\Program Files\PuTTY\agt8.ppk` as the name of the private key file that is used for SSH connection, and then press the **Enter** key.

## 2.7 Backing up and restoring

This section explains how to back up and restore PFM - RM for Virtual Machine.

To be prepared for an error-induced system failure, back up the setup information of PFM - RM for Virtual Machine. Also, acquire a backup when you modify the system, such as during setup of PFM - RM for Virtual Machine.

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

### 2.7.1 Backing up

You can obtain a backup using a procedure such as copying files. Note that before you obtain a backup, you must stop all PFM - RM for Virtual Machine services (of all PFM - RM for Virtual Machine instances).

The tables below describe the files of PFM - RM for Virtual Machine to back up.

Table 2–19: PFM - RM for Virtual Machine files to back up (For physical host)

| No. | File name                                                                            | Explanation                                     |
|-----|--------------------------------------------------------------------------------------|-------------------------------------------------|
| 1   | <i>installation-folder\agt8\agent\*.ini</i> files                                    | Remote Monitor Collector service settings files |
| 2   | <i>installation-folder\agt8\agent\instance-name<sup>#1</sup>\*.ini</i> files         |                                                 |
| 3   | <i>installation-folder\agt8\agent\instance-name<sup>#1</sup>\groups\*.ini</i> files  |                                                 |
| 4   | <i>installation-folder\agt8\agent\instance-name<sup>#1</sup>\targets\*.ini</i> files |                                                 |
| 5   | <i>installation-folder\agt8\plugin\*.ini</i> files                                   |                                                 |
| 6   | <i>installation-folder\agt8\store\*.ini</i> files                                    | Remote Monitor Store service settings files     |
| 7   | <i>installation-folder\agt8\store\instance-name<sup>#1</sup>\*.ini</i> files         |                                                 |

#1

These are folders used for operation in an instance environment. In the case of an instance configuration, as many folders as there are instances are created.

Table 2–20: PFM - RM for Virtual Machine files to back up (For logical host)

| No. | File name                                                                           | Explanation                                     |
|-----|-------------------------------------------------------------------------------------|-------------------------------------------------|
| 1   | <i>installation-folder\agt8\agent\*.ini</i> files                                   | Remote Monitor Collector service settings files |
| 2   | <i>installation-folder\agt8\plugin\*.ini</i> files                                  |                                                 |
| 3   | <i>environment-folder\agt8\instance-name<sup>#1</sup>\*.ini</i> files               |                                                 |
| 4   | <i>environment-folder\agt8\agent\instance-name<sup>#1</sup>\groups\*.ini</i> files  |                                                 |
| 5   | <i>environment-folder\agt8\agent\instance-name<sup>#1</sup>\targets\*.ini</i> files |                                                 |
| 6   | <i>installation-folder\agt8\store\*.ini</i> files                                   | Remote Monitor Store service settings files     |

| No. | File name                                                                         | Explanation                                 |
|-----|-----------------------------------------------------------------------------------|---------------------------------------------|
| 7   | <code>environment-folder\agt8\store\instance-name<sup>#1</sup>\*.ini</code> files | Remote Monitor Store service settings files |

#1

These are folders used for operation in an instance environment. In the case of an instance configuration, as many folders as there are instances are created.

### Important note

When you acquire a backup for PFM - RM for Virtual Machine, try to manage the product version number of the acquired environment. For details about product version numbers, see the release note.

When you acquire a backup, you must record the instance and monitoring target configurations (including logical host environments).

## 2.7.2 Restoring

To restore the settings information of PFM - RM for Virtual Machine, first check the prerequisite conditions listed below, and then copy the backup file to its original location. The backed-up settings information file overwrites the settings information file on the host.

If PFM - RM for Virtual Machine is running on a logical host, the service definition information file on the physical host and in the environment folder is overwritten.

### *Prerequisite conditions*

- PFM - RM for Virtual Machine must already be installed.
- PFM - RM for Virtual Machine services must be stopped.
- The backed up instances and monitoring targets (including logical host environments) must have been set up previously.

### Important note

When you are restoring the settings information of PFM - RM for Virtual Machine, the product version number of the environment from which the backup was acquired must completely match that of the environment to be restored. For details about product version numbers, see the release note.

## 2.8 Settings for using a Web browser to reference manuals

---

In Performance Management, by copying the manual from the CD-ROM provided with the program product onto the host on which PFM - Web Console is installed, you can use a Web browser to view the manual. If PFM - Web Console is running in a cluster system, copy the manual onto both the executing and standby physical hosts.

### 2.8.1 Setup procedure

#### (1) To view the manual from Help on PFM - Web Console

To copy the manual for viewing from PFM - Web Console Help:

1. By following the PFM - Web Console setup procedure, register PFM - RM for Virtual Machine in PFM - Web Console (add and set up PFM - RM for Virtual Machine).

2. On the host on which PFM - Web Console is installed, create a directory in which to copy the manual.

- In Windows: *PFM-Web-Console-installation-folder\doc\en\Help-ID-of-PFM-RM-for-Virtual-Machine*
- In UNIX: */opt/jplpcwebcon/doc/en/Help-ID-of-PFM-RM-for-Virtual-Machine*

For details about the Help ID of PFM - RM for Virtual Machine, see [B. List of Identifiers](#).

3. Copy the following files and directory from the manual CD-ROM to the directory created in Step 2.

##### *HTML manual*

In Windows: All *.htm* files and the GRAPHICS folder under *CD-ROM-drive\MAN\3021\document-number* (e.g., 03004A0D)

In UNIX: All *.htm* files and the GRAPHICS directory under */CD-ROM-mount-point/MAN/3021/document-number* (e.g., 03004A0D)

##### *PDF manual*

In Windows: PDF file under *CD-ROM-drive\MAN\3021\document-number* (e.g., 03004A0D)

In UNIX: PDF file under */CD-ROM-mount-point/MAN/3021/document-number* (e.g., 03004A0D)

When copying, place the *index.htm* file (in the case of the HTML manual) and the PDF file (in the case of the PDF manual) directly under the created file. For details about how to copy a manual, see *readme.txt* in the manual's CD-ROM.

4. Restart PFM - Web Console.

#### (2) Viewing the manual from the hard disk of the computer you are using

Either use *setup.exe* in the CD-ROM to install the manual, or directly copy the HTML files, PDF files, and GIF files to the desired directory. For the HTML manual, use the following directory configuration:

```
html (for storing HTML files and PDF files)
|-GRAPHICS (for storing GIF files)
```

## 2.8.2 Viewing procedure

To view the manual from PFM - Web Console:

1. Click **Help** in the menu bar frame of the Main window of PFM - Web Console.  
The Help window opens.
2. Click the manual name or **PDF** that follows the manual name.  
Clicking the manual name displays an HTML-format manual. Clicking **PDF** displays a PDF-format manual.

*Notes on displaying characters in a Web browser*

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



# 3

## Operations in a Cluster System

This chapter explains the installation and setup procedures necessary for operating PFM - RM for Virtual Machine in a cluster system, and the processing flow for operating PFM - RM for Virtual Machine.

## 3.1 Overview of cluster systems

A *cluster system* is a system in which multiple server systems are linked together to operate as a single system. PFM - RM for Virtual Machine can be operated in the following cluster system.

- HA cluster system

This section explains the configuration needed to operate PFM - RM for Virtual Machine in a cluster system. For a cluster system overview and the system configuration for operating a Performance Management system in a cluster system, see the chapter explaining configuration and operations in a cluster system in the *Job Management Partner 1/ Performance Management User's Guide*.

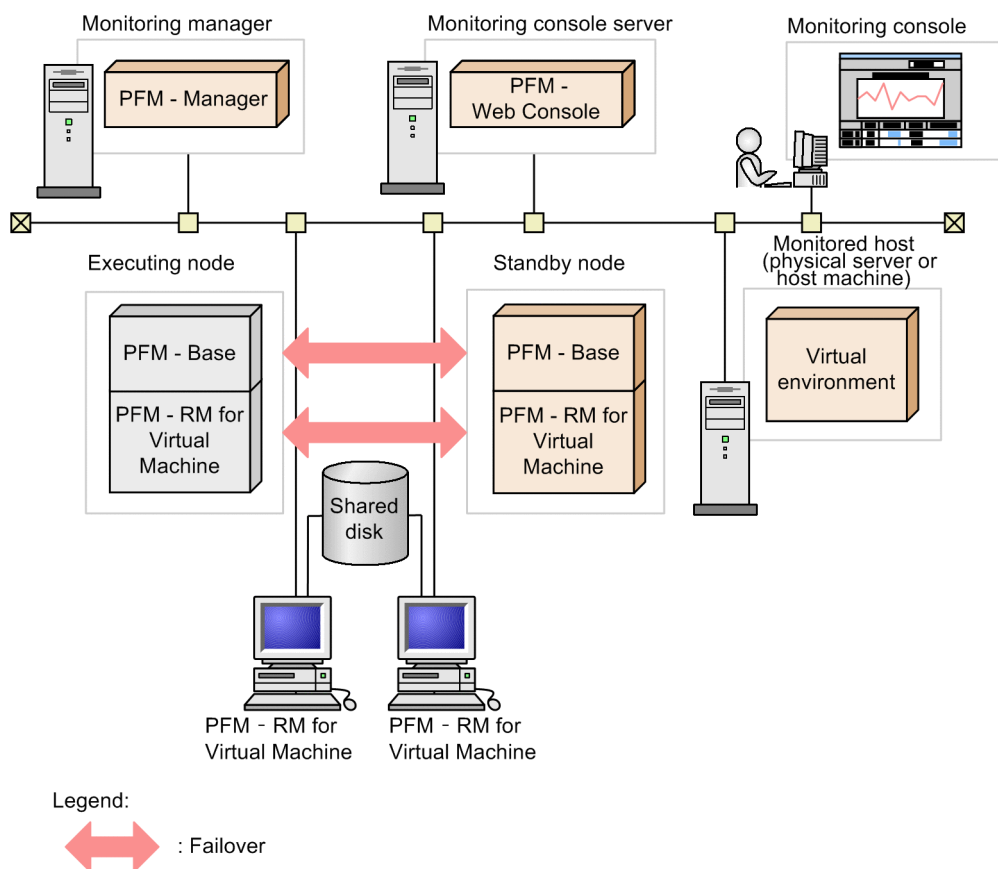
Note that in this chapter, a cluster system means an HA cluster system.

### 3.1.1 Configuring PFM - RM for Virtual Machine in an HA cluster system

When you operate PFM - RM for Virtual Machine in an HA cluster system, you can execute a failover when an error occurs, thereby improving system availability. To operate a PFM environment in an HA cluster system, you normally create an environment in which a PFM instance environment can be executed on both the executing node and a standby node, and use a configuration in which a set of data (e.g., data files, configuration files, and log files) are stored on a shared disk.

To operate a PFM - RM for Virtual Machine environment in an HA cluster system, use the configuration shown in the following figure.

Figure 3–1: Example of a PFM - RM for Virtual Machine configuration in an HA cluster system



As shown in Figure 3-1, PFM - RM for Virtual Machine runs in a logical host environment, and monitors a virtual environment that is running on a different host. Therefore, each host must be set up to be able to connect to the virtual environment under the same host name.

Definition information and performance information are stored on a shared disk, and are inherited during a failover. If multiple Performance Management programs are installed on a single logical host, they use the same shared folder.

Multiple instances of PFM - RM for Virtual Machine can be executed on a single node. If a configuration is being used that contains multiple cluster configurations (an active-active configuration), execute PFM - RM for Virtual Machine in each logical host environment. Each instance of PFM - RM for Virtual Machine runs independently and can execute a failover separately.

## 3.2 Processing when a failover occurs

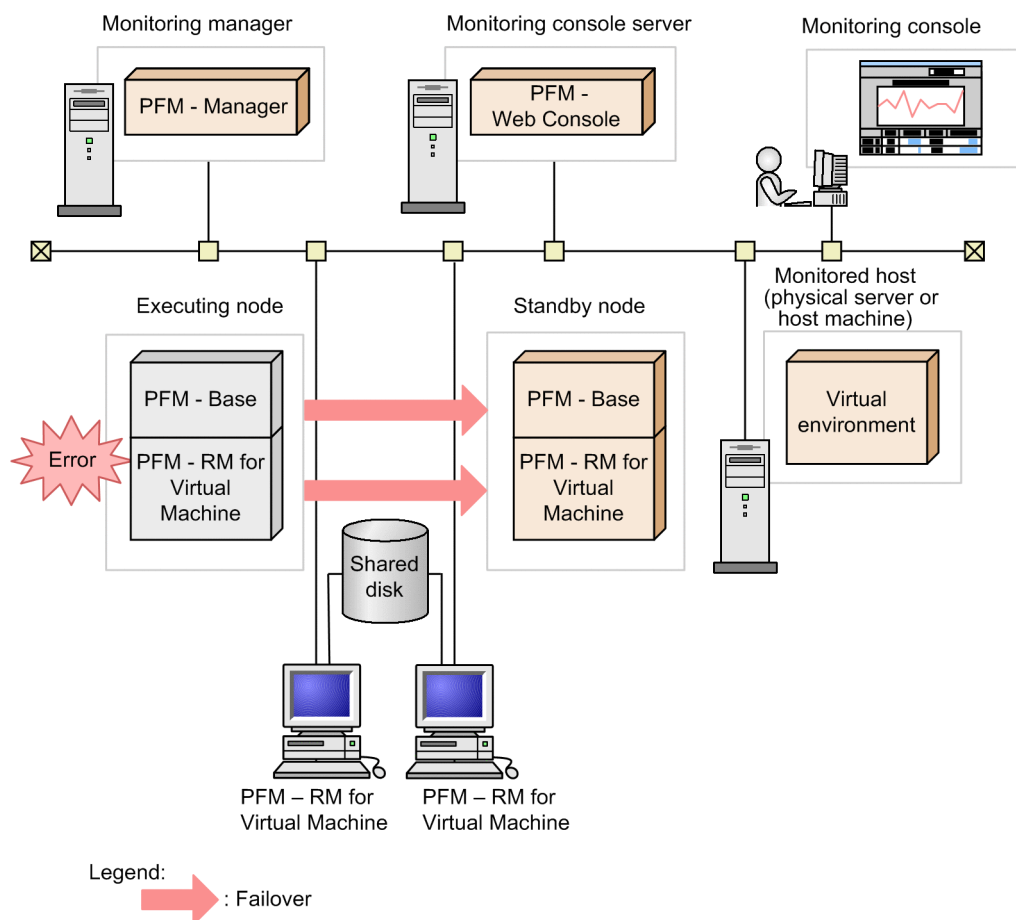
If an error occurs on the executing node, processing moves to a standby node.

This section explains the processing that occurs during a failover when an error occurs in PFM - RM for Virtual Machine. It also explains the effects on PFM - RM for Virtual Machine when an error occurs in PFM - Manager.

### 3.2.1 Failover when an error occurs on the PFM - RM host

The following figure shows how the PFM - RM host that runs PFM - RM for Virtual Machine performs failover if an error occurs.

Figure 3–2: Failover performed when an error occurs on the PFM - RM host



If you operate PFM - Web Console during a PFM - RM for Virtual Machine failover, the message `There was no answer (-6)` is displayed. In this case, wait until a failover is complete before operating PFM - Web Console.

If you operate PFM - Web Console after a PFM - RM for Virtual Machine failover, you will be connected to the PFM - RM for Virtual Machine instance that has started at the failover destination node.

### 3.2.2 Effects when PFM - Manager stops

When PFM - Manager stops, this affects the entire Performance Management system.

PFM - Manager centrally manages the agent information of the PFM - RM for Virtual Machine instances that are running at individual nodes. PFM - Manager also controls alarm event notification when PFM - RM for Virtual Machine exceeds a threshold during performance monitoring, and it controls the execution of actions that are triggered by alarms. Consequently, if PFM - Manager stops, the entire Performance Management system is affected as described in the following table.

**Table 3–1: Effects on PFM - RM for Virtual Machine when PFM - Manager stops**

| Program name                 | Effects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Corrective action                                                                                                                                                                                                                                                                                            |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PFM - RM for Virtual Machine | <p>If PFM - Manager stops while PFM - RM for Virtual Machine is active, the following actions take place:</p> <ul style="list-style-type: none"> <li>• Performance data collection continues.</li> <li>• Since any alarm event that occurs cannot be reported to PFM - Manager, alarm events are held for each alarm definition, and notification is retried until PFM - Manager starts. When the number of alarm events held exceeds 3, the oldest alarm event is overwritten. Furthermore, stopping PFM - RM for Virtual Machine deletes the alarm events being held.</li> <li>• Alarm statuses that have already been reported to PFM - Manager are reset when PFM - Manager restarts. Then, after PFM - Manager checks the status of PFM - RM for Virtual Machine, the alarm statuses are refreshed.</li> <li>• If you try to stop PFM - RM for Virtual Machine, the operation will take a long time because it cannot be reported to PFM - Manager.</li> </ul> | <p>Start PFM - Manager.</p> <p>The PFM - RM for Virtual Machine instances that are running can be operated as is. However, alarms might not be reported as expected in some cases. Therefore, after PFM - Manager is restored, check the KAVE00024-I message, which is output to the common message log.</p> |

Before you decide on the corrective action to take, consider the effects that stoppage of PFM - Manager has. Also note that, in addition to trouble-induced stoppages, there are times that you need to stop PFM - Manager to change a configuration or perform maintenance tasks. Therefore, we recommend that you perform maintenance at a time when there will be little impact on system operations.

## 3.3 Installation and setup

---

This section explains how to install and set up PFM - RM for Virtual Machine in a cluster system.

For details about how to install and set up PFM - Manager, see the chapter that explains configuration and operations in a cluster system in the *Job Management Partner 1/Performance Management User's Guide*.

### 3.3.1 Before installation and setup

This subsection explains the prerequisite conditions, required information, and notes you must be aware of before you install and set up PFM - RM for Virtual Machine.

#### (1) Prerequisite conditions

To use PFM - RM for Virtual Machine in a cluster system, the following prerequisite conditions must be satisfied.

##### (a) Cluster system

Make sure that the following conditions are satisfied:

- The cluster system is being controlled by cluster software.
- The cluster software is set to control startup and termination of any PFM - RM for Virtual Machine instances that run on a logical host.



##### Important note

- In Windows Server 2003, if the application error message box is displayed in Dr. Watson, it may prevent a failover, and therefore you must suppress error notification that uses the message box. For details about how to suppress error notification, see the OS documentation. Note that if you suppress error notification, the collection of information when an application error occurs may be affected.
- When an application error occurs, a dialog box for reporting the error to Microsoft is displayed. If this dialog box is displayed, it may prevent a failover, and therefore you must suppress error notification. For details about how to suppress error notification, see the OS documentation.

##### (b) Shared disk

Make sure that the following conditions are satisfied:

- Each logical host must have a shared disk, and it must be possible to switch from the executing node to a standby node.
- The shared disk must be physically connected to each node via Fibre Channel or SCSI. Performance Management does not support a configuration in which a network drive or a disk replicated via a network is used as a shared disk.
- Even if a problem causes a process that is using the shared disk to remain when a failover occurs, it must be possible to forcibly take the shared disk offline and enable a failover using a means such as cluster software.
- If multiple PFM products are used on a single logical host, the folder name of the shared disks must be the same. You can change the storage destination of the Store database and store it in a different folder on the shared disk.

##### (c) Logical host names and logical IP addresses

Make sure that the following conditions are satisfied:

- Each logical host must have a logical host name, and each logical host name must have a corresponding logical IP address, and it must be possible to switch from the executing node to a standby node.
- The logical host names and logical IP addresses must be set in the `hosts` file and name server.
- If DNS is used, a host name excluding the domain name, not the FQDN name, must be used as the logical host name.
- Physical host names and logical host names must be unique within the system.

### Important note

- Do not specify a physical host name (host name displayed by the `hostname` command) for the logical host name. Otherwise, communication may not be processed correctly.
- A logical host name can use from 1 through 32 bytes of alphanumeric characters. Spaces and the following symbols cannot be specified:  
/ \ : ; \* ? ' " < > | & = , .
- You cannot specify a logical host name that begins with the character string `localhost`, an IP address, or a hyphen (-).

## (d) Settings for using IPv6

Performance Management supports network configurations in IPv4 and IPv6 environments. Performance Management is able to operate with a network configuration in which IPv4 and IPv6 environments coexist.

PFM - RM for Virtual Machine can communicate with PFM - Manager via IPv6.

Note that for Performance Management to operate with that network configuration, the OS of the host on which PFM - RM for Virtual Machine is installed must be Windows Server 2008 R2 or Windows Server 2012. In addition, the OS of the host on which PFM - Manager is installed must be Windows Server 2008 R2, Windows Server 2012 or Linux.

For information about the applicable scope of communications in IPv4 and IPv6 environments, see *K. Communications in IPv4 and IPv6 Environments*.

To make it possible to communicate via IPv6, the setting for using IPv6 must be enabled on both the PFM - Manager host and the PFM - RM host. This setting can be enabled by using the `jpccconf ipv6 enable` command. However, there are cases in which execution of this command is necessary and others where it is unnecessary.

Cases in which the `jpccconf 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 in which the `jpccconf 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 `jpccconf ipv6 enable` command:

```
jpccconf ipv6 enable
```

Make sure that you execute the `jpccconf ipv6 enable` command on both the executing node and the standby node.

For details about the `jpccconf 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 `jpccconf 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 Virtual Machine, specify the name of a monitored host where name resolution can be performed.

Communication between PFM - RM for Virtual Machine 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 Virtual Machine 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 that a connection can be established beforehand.

### (e) WMI connection (when the virtual environment uses Hyper-V)

Confirm that the following condition is satisfied:

- The same user account that can connect to the monitored host via WMI is created on both the executing node and the standby node.

For details about the WMI connection settings, see [2.5.2\(1\) Setting up WMI connection](#).

### (f) SSH connection (when the virtual environment uses KVM)

Confirm that the following conditions are satisfied:

- A private key is stored at the same path on both the executing node and the standby node.
- The private key can be used to connect to the monitored host.
- PuTTY is installed at the same path on both the executing node and the standby node.

#### Important note

Use either of the following methods to register the private key and public key:

- After creating a private key on the active server and copying the private key to the standby server, pair the private key with the public key that is distributed from the active server to the monitored host.
- After creating public keys separately on the active and standby servers, register both of these public keys on the monitored host so that either of the public keys can be paired with the private key.

For details about the SSH connection settings, see [2.5.3 For KVM](#).

## (2) Information necessary for setting up PFM - RM for Virtual Machine to run on a logical host

To set up PFM - RM for Virtual Machine to run on a logical host, you need the types of information listed in the table below in addition to the environment information normally necessary for setting up PFM - RM for Virtual Machine.



Table 3–2: Information necessary for setting up PFM - RM for Virtual Machine to run on a logical host

| Item               | Example       |
|--------------------|---------------|
| Logical host name  | jpl-halvm     |
| Logical IP address | 172.16.92.100 |
| Shared disk        | S:\jpl        |

When multiple Performance Management programs are set to run on a single logical host, they must use the same folder on the shared disk.

To estimate the size necessary for the shared disk, see [A. Estimating System Requirements](#).

### (3) Notes on using PFM - RM for Virtual Machine to cause a failover on a logical host

If you are using a system configuration in which PFM - RM for Virtual Machine runs on a logical host, decide whether a failover should occur on the entire logical host when an error occurs in PFM - RM for Virtual Machine.

If an error in PFM - RM for Virtual Machine causes a failover on the entire logical host, business applications that are running on the same logical host as PFM - RM for Virtual Machine will also fail over. This may adversely affect operations.

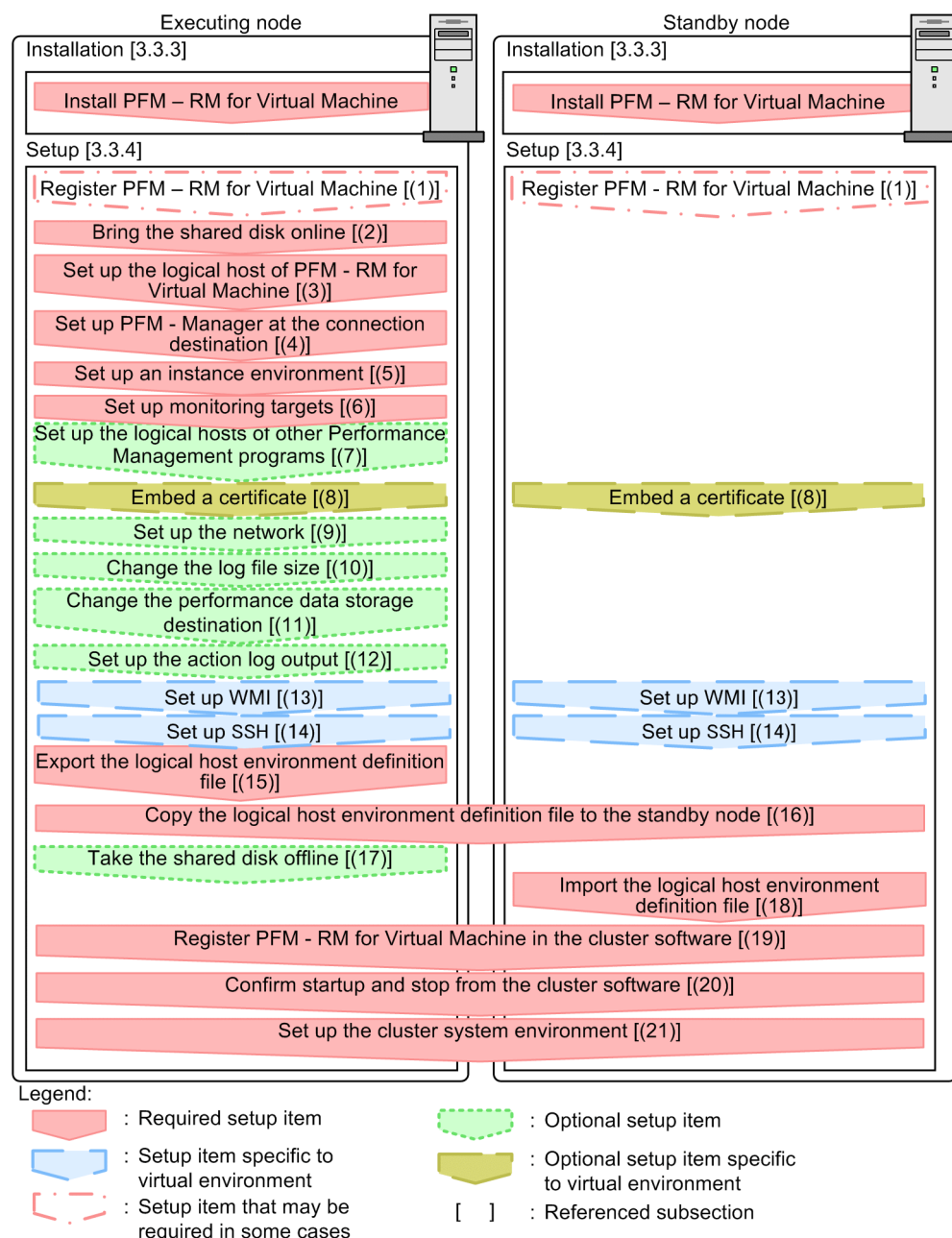
### (4) Note on version upgrading of the logical host

When you upgrade the version of PFM - RM for Virtual Machine running on the logical host, you need to place the shared disk online on either the executing node or the standby node.

## 3.3.2 Installation and setup flow

The following figure shows the flow for installing and setting up PFM - RM for Virtual Machine so that it runs on a logical host in a cluster system.

Figure 3–3: Flow for installing and setting up PFM - RM for Virtual Machine so that it runs on a logical host in a cluster system



**Note:**

Even when you set up PFM - RM for Virtual Machine in the logical host environment, the definition content of PFM - RM for Virtual Machine in the physical host environment is not inherited. For both the logical host environment and the physical host environment, a new environment is created when an instance environment is set up.

### 3.3.3 Installation procedure

Install PFM - RM for Virtual Machine on both the executing node and the standby node.



## Important note

The installation destination is the local disk. Do not install PFM - RM for Virtual Machine on a shared disk.

The installation procedure is the same as that used for a non-cluster system. For details about the installation procedure, see [2.1.3 Installation procedure](#).

### 3.3.4 Setup procedure

This subsection explains the setup for operating Performance Management in a cluster system.

The setup procedure depends on the virtual environment to be monitored. The table below lists the setup items required for each virtual environment.

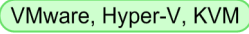



Table 3–3: Setup items required for each virtual environment

| Setup item                                                                    | VMware | Hyper-V | KVM |
|-------------------------------------------------------------------------------|--------|---------|-----|
| (1) Registering PFM - RM for Virtual Machine                                  | Y      | Y       | Y   |
| (2) Bringing the shared disk online                                           | Y      | Y       | Y   |
| (3) Setting up the logical host of PFM - RM for Virtual Machine               | Y      | Y       | Y   |
| (4) Setting up PFM - Manager at the connection destination                    | Y      | Y       | Y   |
| (5) Setting up an instance environment                                        | Y      | Y       | Y   |
| (6) Setting up monitoring targets                                             | Y      | Y       | Y   |
| (7) Setting up the logical hosts of other Performance Management programs     | Y      | Y       | Y   |
| (8) Embedding a certificate                                                   | Y      | N       | N   |
| (9) Setting up the network                                                    | Y      | Y       | Y   |
| (10) Changing the log file size                                               | Y      | Y       | Y   |
| (11) Changing the performance data storage destination                        | Y      | Y       | Y   |
| (12) Setting up the action log output                                         | Y      | Y       | Y   |
| (13) Setting WMI                                                              | N      | Y       | N   |
| (14) Setting SSH                                                              | Y      | Y       | Y   |
| (15) Exporting the logical host environment definition file                   | Y      | Y       | Y   |
| (16) Copying the logical host environment definition file to the standby node | Y      | Y       | Y   |
| (17) Taking the shared disk offline                                           | Y      | Y       | Y   |
| (18) Importing the logical host environment definition file                   | Y      | Y       | Y   |
| (19) Registering PFM - RM for Virtual Machine in cluster software             | Y      | Y       | Y   |
| (20) Confirming startup and stop from cluster software                        | Y      | Y       | Y   |
| (21) Setting up a cluster system environment                                  | Y      | Y       | Y   |



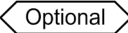
Legend:

Y: Setup is required.

N: Setup is not required.

The icon  ,  ,  , or  indicates a setup item required for the indicated virtual environment.

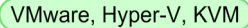
There are setup procedures for the executing node and for the standby node. Set up the executing node first and then set up the standby node.

The icon  indicates an item that must be set up for the executing node, and the icon  indicates an item that must be set up for the standby node. The icon  indicates an item that may be required depending on the environment that is used, or an optional setup item that is available for changing the default setting.


### Important note

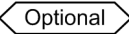
- Do not set `JPC_HOSTNAME` as an environment variable because it is used in Performance Management. If you do so, Performance Management will not operate correctly.
- To use SSL for communication with the virtual environment, a certificate must be installed not only on the executing node, but also on the standby node. For details about installing a certificate, see [2.5.1 For VMware](#).

## (1) Registering PFM - RM for Virtual Machine









To use PFM - Manager and PFM - Web Console to centrally manage PFM - RM for Virtual Machine, you need to register PFM - RM for Virtual Machine in PFM - Manager and PFM - Web Console.

You must register PFM - RM for Virtual Machine in the following cases:

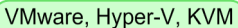
- When newly adding PFM - RM for Virtual Machine to a Performance Management system
- When updating the version of the data model of a PFM - RM for Virtual Machine instance that has already been registered

Registration of PFM - RM for Virtual Machine is performed in PFM - Manager and PFM - Web Console. The procedure is the same as that used for a non-cluster system. For details about the procedure, see [2.1.4\(1\) Registering PFM - RM for Virtual Machine](#).

To operate PFM - RM for Virtual Machine in a cluster system, you need to setup the PFM - RM for Virtual Machines. The setup procedure is the same as that used for a non-cluster system. For details about the procedure, see [2.1.4\(2\) Setting PFM - RM for Virtual Machine](#).

You need to specify the same settings on both the executing node and the standby node.

## (2) Bringing the shared disk online





Confirm that the shared disk is online. If the shared disk is not online, bring it online using a cluster software operation or volume manager operation.

### (3) Setting up the logical host of PFM - RM for Virtual Machine

VMware, Hyper-V, KVM

Executing system

Create a logical host environment by executing the `jpccconf ha setup` command. Executing this command copies the necessary data to the shared disk, sets up a definition for the logical host, and creates a logical host environment.

*Note:*

Before executing the command, stop all Performance Management programs and services in the entire Performance Management system. For details about how to stop services, see the chapter that explains startup and termination of Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

To set up a logical host:

1. Create a logical host environment of PFM - RM for Virtual Machine by executing the `jpccconf ha setup` command.

Execute the command as follows.

```
jpccconf ha setup -key RMVM -lhost jpl-halvm -d S:\jpl
```

Specify a logical host name in the `-lhost` option. Here, `jpl-halvm` is used as the logical host name. If DNS is used, specify a logical host name with the domain name omitted.

Specify the folder name of the shared disk in the environment folder name of the `-d` option. For example, if `-d S:\jpl` is specified, `S:\jpl\jplpc` is created and a logical host environment file is created.

#### Important note

Make sure that the path name specified as the environment folder name does not include the following characters:

( )

If at least one of the above characters is included, although the environment of the logical host might be successfully created, PFM - RM for Virtual Machine cannot start.

2. Confirm the logical host settings by executing the `jpccconf ha list` command.

Execute the command as follows.

```
jpccconf ha list -key all
```

Confirm that the created logical host environment is correct.

### (4) Setting up PFM - Manager at the connection destination

VMware, Hyper-V, KVM

Executing system

Set up the PFM - Manager that manages PFM - RM for Virtual Machine by executing the `jpccconf mgrhost define` command.

1. Set up PFM - Manager at the connection destination by executing the `jpccconf mgrhost define` command.

Execute the command as follows.

```
jpccconf mgrhost define -host jpl-hal -lhost jpl-halvm
```

Specify the host name of PFM - Manager at the connection destination in the `-host`. If the PFM - Manager instance at the connection destination is running on a logical host, specify the logical host name of PFM - Manager at the connection destination in the `-host`. Here, `jp1-hal` is used as the logical host name of PFM - Manager.

Specify the logical host name of PFM - RM for Virtual Machine in the `-lhost` option. Here, `jp1-halvm` is used as the logical host name of PFM - RM for Virtual Machine.

## (5) Setting up an instance environment VMware, Hyper-V, KVM Executing system

Set up an instance environment for PFM - RM for Virtual Machine by executing the `jpccconf inst setup` command.

The setup procedure is the same as that used for a non-cluster system. Note, however, that in the case of a cluster system, you must specify a logical host name in the `-lhost` option when you execute the `jpccconf inst setup` command.

The procedure for specifying the `jpccconf inst setup` command for a cluster system is as follows.

```
jpccconf inst setup -key RMVM -lhost jp1-halvm -inst inst1
```

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

For other setting details and procedures, see [2.1.4\(3\) Setting up an instance environment](#).

## (6) Setting up monitoring targets VMware, Hyper-V, KVM Executing system

Set up the monitoring-target hosts of PFM - RM for Virtual Machine by executing the `jpccconf target setup` command.

The setup procedure is the same as that used for a non-cluster system. Note, however, that in the case of a cluster system, you must specify a logical host name with the `-lhost` option when you execute the `jpccconf target setup` command.

The following shows an example of the `jpccconf target setup` command that can be executed in a cluster system.

```
jpccconf target setup -key RMVM -lhost jp1-halvm -inst inst1 -target  
targethost1
```

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

For other setting details and procedures, see [2.1.4\(4\) Setting up monitoring targets](#).

## (7) Setting up the logical hosts of other Performance Management programs VMware, Hyper-V, KVM Executing system Optional

Besides PFM - RM for Virtual Machine, if there are other programs such as PFM - Manager and PFM - RM for Virtual Machine that must be set up on the same logical host, set them up at this stage.

For details about how to perform setup, see the chapter that explains configuration and operations in a cluster system in the *Job Management Partner 1/Performance Management User's Guide*.

## (8) Embedding a certificate VMware Executing system Standby system Optional

Before you use SSL to communicate with a virtual environment, you need to embed a certificate. For details, [2.5.1 For VMware](#). Note that you must also embed a certificate on the standby node.

*Notes:*

If a certificate is not embedded before you use SSL to communicate with a virtual environment, the following problems may occur:

- During performance data collection, it may take quite a while to receive a response from VMware at the connection destination.
- Because of the delay in receiving a response from VMware at the connection destination, performance data collection might not be completed within the prescribed collection interval, resulting in a collection failure.
- An error occurs when you perform an operation that generates a query to the Remote Monitor Collector service of PFM - RM for Virtual Machine, such as display of service properties, from PFM - Web Console.

## (9) Setting up the network VMware, Hyper-V, KVM Executing system Optional

This is necessary only when you want to change the setup according to the network configuration that uses Performance Management.

During network setup, you can specify the following two items:

- IP address

To specify the IP address to be used for operating Performance Management in a network that is connected to multiple LANs, directly edit the content of the `jpchosts` file.

Copy the edited `jpchosts` file from the executing node to the standby node (place the `jpchosts` file under the `installation-folder\jp1pc\` folder of the physical host).

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

- Port numbers

To communicate among Performance Management programs via a firewall, set up port numbers by executing the `jpconf port` command.

For details about how to set up port numbers, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*, and the chapter that explains configuration and operations in a cluster system in the *Job Management Partner 1/Performance Management User's Guide*.

## (10) Changing the log file size VMware, Hyper-V, KVM Executing system Optional

The operation status of Performance Management is output to a log file specific to Performance Management. This log file is called the *common message log*. By default, the common message log uses two files, each with 2,048 kilobytes. This setting is necessary only when you want to change the size of this file.

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



## (11) Changing the performance data storage destination

VMware, Hyper-V, KVM

Executing system

Optional

This setting is necessary only when you want to change the folder at the save destination, the backup destination, the export destination, or the import destination for the database that stores the performance data managed by PFM - RM for Virtual Machine.

For details about this setting, see [2.1.4\(8\) Changing the performance data storage destination](#).

## (12) Setting up the action log output

VMware, Hyper-V, KVM

Executing system

Optional

This setting is necessary if you want to output an action log when an alarm occurs. An action log contains history information that is output in conjunction with the alarm function, which monitors items such as the system load threshold.

For details about this setting, see [1. Outputting Action Log Data](#).

## (13) Setting up WMI

Hyper-V

Executing system

Standby system

For details about the WMI settings, see [2.5.2 For Hyper-V](#).

## (14) Setting up SSH

KVM

Executing system

Standby system

For details about setting up SSH, see [2.5.3 For KVM](#).

## (15) Exporting the logical host environment definition file

VMware, Hyper-V, KVM

Executing system

When you have created a logical host environment for PFM - RM for Virtual Machine, export the environment definitions to a file. An export operation immediately outputs to a file the Performance Management program definition information that is set up on the logical host. If you are setting up other Performance Management programs on the same logical host, export the information after all of these programs have been set up.

To export the logical host environment definitions:

1. Export the logical host environment definitions by executing the `jpccconf ha export` command.

The logical host environment definition information that has been created up until now is output to an export file. You can use any desired export file name.

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

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

## (16) Copying the logical host environment definition file to the standby node

VMware, Hyper-V, KVM

Executing system

Standby system

Copy the logical host environment definition file exported in [\(15\) Exporting the logical host environment definition file](#) from the executing node to the standby node.



## (17) Taking the shared disk offline

VMware, Hyper-V, KVM

Executing system

Optional

Using a cluster software operation or volume manager operation, take the shared disk offline to complete the task. If you plan to continue using the shared disk, there is no need to take it offline.

## (18) Importing the logical host environment definition file

VMware, Hyper-V, KVM

Standby system

Import the export file copied from the executing node onto the standby node.

To specify the setting for executing the Performance Management program of the logical host created in the executing node on the standby node, use the `jpcconf ha import` command. If multiple Performance Management programs have been set up for a single logical host, all logical host environment definition files will be imported at once.

When you execute this command, there is no need to bring the shared disk online.

To import the logical host environment definition file:

1. Import the logical host environment definitions by executing the `jpcconf ha import` command.

Execute the command as follows.

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

When the command is executed, the settings of the standby node environment are changed to match the content of the export file. As a result, the settings for starting PFM - RM for Virtual Machine of the logical host are implemented.

If a fixed port number was set by the `jpcconf port` command during setup, it will be set in the same way.

2. Confirm the logical host settings by executing the `jpcconf ha list` command.

Execute the command as follows.

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

Confirm that the command displays the same content that was displayed when the `jpcconf ha list` command was executed at the executing node.

## (19) Registering PFM - RM for Virtual Machine in cluster software

VMware, Hyper-V, KVM

Executing system

Standby system

To operate Performance Management programs in a logical host environment, you need to register them in cluster software, and set up the environment such that the Performance Management programs can be started and stopped based on controls from the cluster software.

For details about how to register PFM - RM for Virtual Machine in cluster software, see the cluster software documentation.

The settings that are necessary for registering PFM - RM for Virtual Machine in cluster software are explained below, using items that need to be registered in Windows MSCS as examples.

For PFM - RM for Virtual Machine, register in the cluster software the services described in the following table.

For the dependency settings specified if PFM - RM for Virtual Machine is on the PFM - Manager logical host, see the chapter on cluster system setup and operation in the *Job Management Partner 1/Performance Management User's Guide*.

Table 3–4: PFM - RM for Virtual Machine services to register in cluster software

| No. | Name                                                            | Service name                              | Resource dependencies                         |
|-----|-----------------------------------------------------------------|-------------------------------------------|-----------------------------------------------|
| 1   | PFM - RM Store for Virtual Machine <i>instance-name</i> [LHOST] | JP1PCAGT_8S_ <i>instance-name</i> [LHOST] | IP address resource<br>Physical disk resource |
| 2   | PFM - RM for Virtual Machine <i>instance-name</i> [LHOST]       | JP1PCAGT_8A_ <i>instance-name</i> [LHOST] | Cluster resource for Item No. 1               |
| 3   | PFM - Action Handler [LHOST]                                    | JP1PCMGR_PH [LHOST]                       | IP address resource<br>Physical disk resource |

Replace [LHOST] with a logical host name. If the instance name is *inst1* and the logical host name is *jp1-halvm*, the name becomes PFM - RM Store for Virtual Machine *inst1* [*jp1-halvm*], and the service name becomes JP1PCAGT\_8S\_*inst1* [*jp1-halvm*].

For details about how to set the distributed transaction coordinator (MSDTC) resource, see the relevant article in the Microsoft Knowledge Base on the Microsoft website.

For PFM - RM for Virtual Machine, register these services as MSCS resources. Set each resource as described below. Bold characters indicate MSCS setting items.

- Register **Resource type** as **Generic Service**.
- Set **Name**, **Resource Dependencies**, and **Service name** as shown in Table 3-3.
- Do not set **Start parameters** or **Registry Replication**.
- On the **Advanced** page in **Properties**, specify the settings according to whether you want a failover to occur in the event of a Performance Management program failure.

For example, to cause a failover when a failure occurs in PFM - RM for Virtual Machine, specify the following:

- **Restart**: Select
- **Apply to group**: Select
- **Threshold** for the restart retry count: 3<sup>#</sup>

#

Normally, set **Threshold** for the restart retry count to 3.

*Note:*

Since services that are registered in the cluster software are started and stopped from the cluster, set their **Startup type** to **Manual** so that they do not automatically start when the OS starts. Immediately after a service is set up by the `jpccconf ha setup` command, it is set to **Manual**.

Do not perform a forced stop by executing the following command:

```
jpccspm stop -key all -lhost jp1-halvm -kill immediate
```

## (20) Confirming startup and stop from the cluster software VMware, Hyper-V, KVM

Executing system

Standby system

From the cluster software, try to start and stop the Performance Management programs at each node, and confirm that the starting and stopping operations work normally.

## (21) Setting up the cluster system environment

VMware, Hyper-V, KVM

Executing system

Standby system

Once you have finished setting up the Performance Management programs, set up the environment for these programs so that a report can be displayed from PFM - Web Console on the operation status of a monitored target according to the operating mode, and so that a user notification can be sent when a problem occurs on the monitored target.

For details about how to set up the environment for Performance Management programs, see the chapter that explains configuration and operations in a cluster system in the *Job Management Partner 1/Performance Management User's Guide*.

## 3.4 Uninstallation and unsetup

---

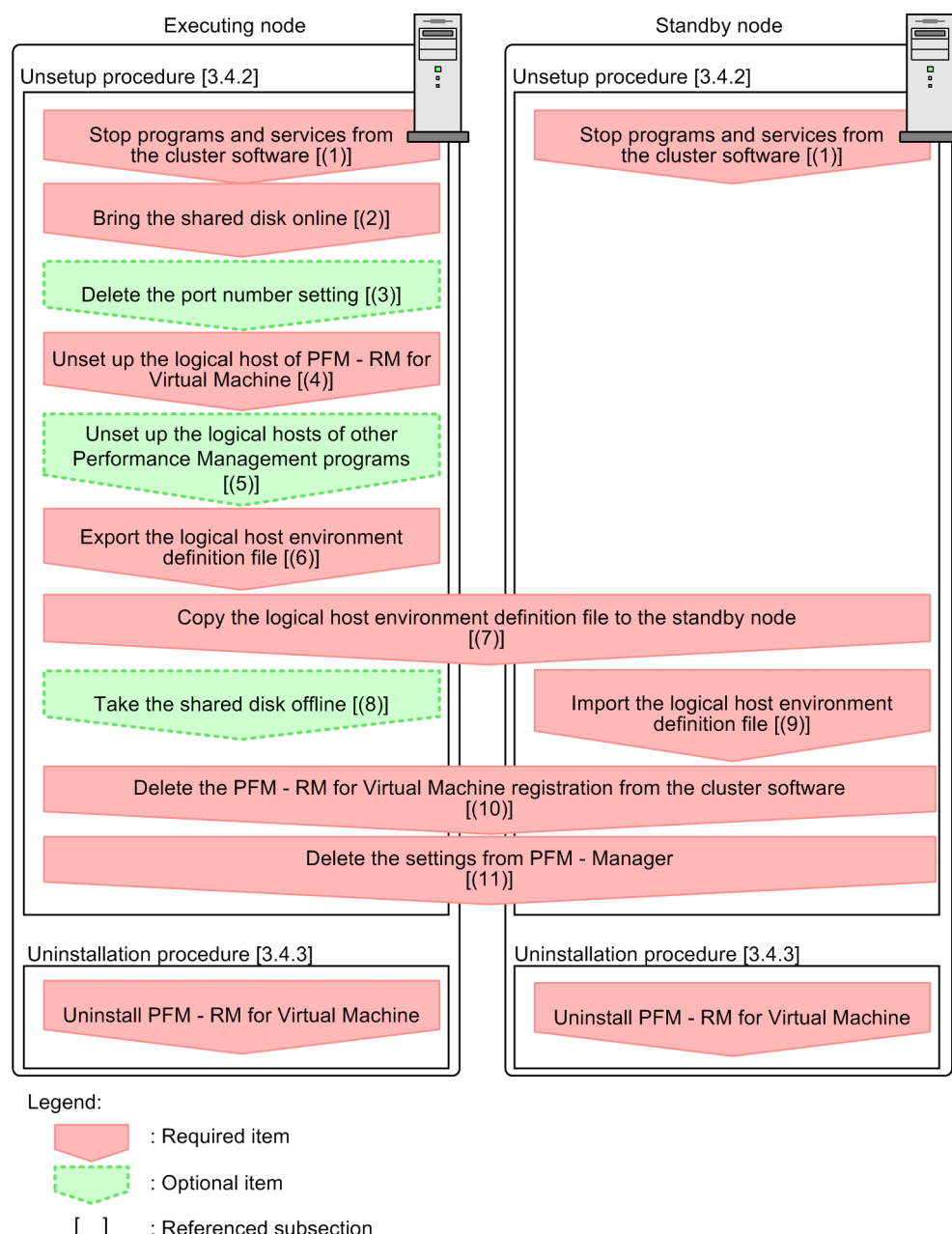
This section explains how to uninstall and unsetup a PFM - RM for Virtual Machine instance that has been operating in a cluster system.

For details about how to uninstall and unsetup PFM - Manager, see the chapter that explains configuration and operations in a cluster system in the *Job Management Partner 1/Performance Management User's Guide*.

### 3.4.1 Uninstallation and unsetup flow

The figure below shows the flow for uninstalling and unsetting up a PFM - RM for Virtual Machine instance that has been operating in a cluster system.

Figure 3–4: Flow for uninstalling and unsetting up a PFM - RM for Virtual Machine instance that runs on a logical host in a cluster system



## 3.4.2 Unsetup procedure

Unset up the logical host environment. The unsetup procedure depends on the virtual environment to be monitored. The icon **VMware, Hyper-V, KVM** indicates an unsetup item required for the indicated virtual environment.

There are unsetup procedures for the executing node and for the standby node. Perform unsetup at the executing node first and then at the standby node.

The icon **Executing system** indicates an item that must be unset up from the executing node; the icon **Standby system** indicates an item that must be unset up from the standby node. The icon **Optional** indicates an item that may require unsetup depending on the environment that is used, or an optional unsetup item that is available for changing the default setting.

This subsection explains how to unset up PFM - RM for Virtual Machine.

## (1) Stopping programs and services from the cluster software

VMware, Hyper-V, KVM

Executing system

Standby system

From the cluster software, stop the Performance Management programs and services that are active at the executing node and the standby node. For details about how to stop programs and services, see the cluster software documentation.

## (2) Bringing the shared disk online

VMware, Hyper-V, KVM

Executing system

Confirm that the shared disk is online. If the shared disk is not online, bring it online using a cluster software operation or volume manager operation.

## (3) Deleting the port number setting

VMware, Hyper-V, KVM

Executing system

Optional

This procedure is required only if you set up port numbers using the `jpccconf port` command during setup in an environment that uses a firewall.

For details about how to delete port numbers, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*, and the chapter that explains configuration and operations in a cluster system in the *Job Management Partner 1/Performance Management User's Guide*.

## (4) Unsetting up the logical host of PFM - RM for Virtual Machine

VMware, Hyper-V, KVM

Executing system

The procedure for unsetting up the logical host follows.

*Note:*

If you delete the logical host environment while the shared disk is offline, only the settings of the logical host residing on the physical host are deleted, and folders and files on the shared disk are not deleted. In this case, you need to bring the shared disk online and manually delete the `jp1pc` folder from the environment folder.

To unset up the logical host:

1. Confirm the logical host settings by executing the `jpccconf ha list` command.

Execute the command as follows.

```
jpccconf ha list -key all -lhost jp1-halvm
```

Before unsetting up the logical host environment, check the current settings. Check items such as the logical host name and the shared disk path.

2. Delete the information about the virtual environment monitored by PFM - RM for Virtual Machine.

Execute the command as follows.

```
jpccconf target unsetup -key RMVM -lhost jp1-halvm -inst inst1 -target targethost1
```

When the `jpccconf target unsetup` command is executed, the virtual environment monitored by the logical host is no longer monitored.

3. Delete the instance environment of PFM - RM for Virtual Machine.

Execute the command as follows.

```
jpccconf inst unsetup -key RMVM -lhost jpl-halvm -inst inst1
```

Executing the `jpccconf inst unsetup` command deletes the settings for starting the logical host instance. Additionally, the instance file is deleted from the shared disk.

4. Delete the logical host environment of PFM - RM for Virtual Machine by executing the `jpccconf ha unsetup` command.

Execute the command as follows.

```
jpccconf ha unsetup -key RMVM -lhost jpl-halvm
```

Executing the `jpccconf ha unsetup` command deletes the settings for starting PFM - RM for Virtual Machine on the logical host. Also, the files for the logical host are deleted from the shared disk.

5. Use the `jpccconf ha list` command to confirm the logical host settings.

Execute the command as follows.

```
jpccconf ha list -key all
```

Confirm that PFM - RM for Virtual Machine has been deleted from the logical host environment.

## (5) Unsetting up the logical hosts of other Performance Management programs

VMware, Hyper-V, KVM

Executing system

Optional

Besides PFM - RM for Virtual Machine, if there are other Performance Management programs that need to be unset up from the same logical host, unset them up at this time.

For details about the unsetup procedure, see the chapter that explains configuration and operations in a cluster system in the *Job Management Partner 1/Performance Management User's Guide*, or the chapter that explains operations in a cluster system in each PFM - RM manual.

## (6) Exporting the logical host environment definition file

VMware, Hyper-V, KVM

Executing system

After you have deleted PFM - RM for Virtual Machine from the logical host, export the environment definitions to a file.

Performance Management uses a method that matches the environment of the standby system to that of the executing system by exporting and importing the environment definitions. When the environment definitions (from which the Performance Management definition has been deleted) exported from the executing node are imported onto the standby node, they are compared with the standby node's existing environment definitions (which includes the Performance Management definition prior to its deletion). The difference (the part that was deleted from the executing node) is identified, and the environment definition for Performance Management is deleted.

To export the logical host environment definition file:

1. Export the logical host environment definitions by executing the `jpccconf ha export` command.

Output the definition information of the logical host environment for Performance Management to a file. You can use any desired export file name. For example, to export the logical host environment definitions to the `lhostexp.txt` file, execute the command as follows.

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

## (7) Copying the logical host environment definition file to the standby node

VMware, Hyper-V, KVM

Executing system

Standby system

Copy the logical host environment definition file exported in (6) *Exporting the logical host environment definition file* from the executing node to the standby node.

## (8) Taking the shared disk offline

VMware, Hyper-V, KVM

Executing system

Optional

Using a cluster software operation or volume manager operation, take the shared disk offline to complete the task. If you plan to continue using the shared disk, there is no need to take it offline.

## (9) Importing the logical host environment definition file

VMware, Hyper-V, KVM

Standby system

Import the export file copied from the executing node onto the standby node in order to commit the file to the standby node. At the standby node, there is no need to take the shared disk offline during the import operation.

To import the logical host environment definition file:

1. Import the logical host environment definitions by executing the `jpccconf ha import` command.

Execute the command as follows.

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

When the command is executed, the settings are changed to match the standby node environment to the content of the export file. As a result, the setting for starting the PFM - RM for Virtual Machine instance of the logical host is deleted. If the Performance Management programs of other logical hosts have been unset up, those settings are also deleted. If a fixed port number was set up using the `jpccconf port` command during setup, it is deleted as well.

2. Confirm the logical host settings by executing the `jpccconf ha list` command.

Execute the command as follows.

```
jpccconf ha list -key all
```

Confirm that the command displays the same content that was displayed when the `jpccconf ha list` command was executed at the executing node.

## (10) Deleting the PFM - RM registration from the cluster software

VMware, Hyper-V, KVM

Executing system

Standby system

Delete the settings for the PFM - RM for Virtual Machine instance of the logical host from the cluster software. For details about how to delete the settings, see the cluster software documentation.



## (11) Deleting the settings from PFM - Manager

VMware, Hyper-V, KVM

Executing system

Standby system

From PFM - Web Console, log into PFM - Manager and delete the definition related to the PFM - RM for Virtual Machine instance that is being unset up.

To delete the settings:

1. Delete the agent from PFM - Web Console.

2. Delete the agent information of PFM - Manager.

For example, if PFM - Manager is running on the logical host `jp1-hal` and PFM - RM for Virtual Machine is running on the logical host `jp1-halvm`, specify the following and then execute the command:

```
jpctool service delete -id service-ID -host jp1-halvm -lhost jp1-hal
```

For *service-ID*, specify the service ID of the agent to be deleted.

3. Restart the PFM - Manager services.

For details about how to start a service, see the chapter that explains startup and termination of 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 Virtual Machine from both the executing node and the standby node.

The uninstallation procedure is the same as that used for a non-cluster system. For the procedure, see [2.2.3 Uninstallation procedure](#).

Notes:

- Before you uninstall PFM - RM for Virtual Machine, stop all Performance Management programs and services on the node from which you are uninstalling PFM - RM for Virtual Machine.
- If you uninstall PFM - RM for Virtual Machine without deleting the logical host environment, the environment folder may remain. In this case, delete the environment folder.

## 3.5 Changing the PFM - RM for Virtual Machine system configuration

---

In response to a change in the network configuration of the monitored system or its host name, you may need to modify the system configuration of PFM - RM for Virtual Machine.

If you modify the system configuration of PFM - RM for Virtual Machine, you must also modify the settings of PFM - Manager and PFM - Web Console. For details about how to modify the system configuration of Performance Management, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*. Note that when you are changing the logical host name, some PFM - RMs may require specific additional tasks. However, in the case of PFM - RM for Virtual Machine, no specific additional tasks are required.

## 3.6 Changing the PFM - RM for Virtual Machine operation method

This subsection explains how to change the operation of PFM - RM for Virtual Machine in a cluster system. For details about how to change the operation of Performance Management as a whole, see the chapter that explains cluster system configuration and operation in the *Job Management Partner 1/Performance Management User's Guide*.

### 3.6.1 Updating the instance environment settings

To update the instance environment in a cluster system, confirm the logical host name and the instance name, and then update the instance information. Set the instance information from the PFM - RM host on the executing node.

Check the information that needs to be updated by referring to [2.4.2 Updating an instance environment](#).

To confirm the logical host name and the instance name, use the `jpcconf ha list` command. To update the instance environment, use the `jpcconf inst setup` command.

The procedure for updating the instance environment follows. To update multiple instance environments, repeat this procedure.

1. Confirm the logical host name and the instance name.

Specify the service key indicating the PFM - RM for Virtual Machine instance that is running in the instance environment to be updated, and then execute the `jpcconf ha list` command.

For example, to confirm the logical host name and the instance name of PFM - RM for Virtual Machine, specify the following and then execute the command.

```
jpcconf ha list -key RMVM
```

If the logical host name that has been set is `jpl_halvm` and the instance name is `inst1`, the following is displayed:

| Logical Host Name | Key  | Environment Directory | Instance Name |
|-------------------|------|-----------------------|---------------|
| jpl_halvm         | RMVM | logical-host-path     | inst1         |

2. If there are any active PFM - RM for Virtual Machine services in the instance environment to be updated, stop these services from the cluster software.
3. If the shared disk goes offline in Step 2, bring it online using a cluster software operation or volume manager operation.
4. Specify both the service key and the instance name indicating the PFM - RM for Virtual Machine instance that is running in the instance environment to be updated, and then execute the `jpcconf inst setup` command.

For example, to update an instance environment in which the logical host name of PFM - RM for Virtual Machine is `jpl_halvm` and the instance name is `inst1`, specify the following and then execute the command.

```
jpcconf inst setup -key RMVM -lhost jpl_halvm -inst inst1
```

5. Update the instance information of PFM - RM for Virtual Machine.

Enter the instance information of PFM - RM for Virtual Machine as instructed by the command. For details about the instance information of PFM - RM for Virtual Machine, see [2.4.2 Updating an instance environment](#). The current settings are displayed (note that the password value will not be displayed). If you choose not to change the displayed value, simply press the **Enter** key. Once all information has been input, the instance environment is updated.

6. Restart the services of the updated instance environment from the cluster software.

For details about how to start a service, see the chapter that explains startup and termination of Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

*Note:*

If you wish to change the value of an item that cannot be updated, first delete the instance environment and then re-create one.

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

## 3.6.2 Updating monitoring targets

If you want to update monitoring targets in a cluster system, first check the monitoring target names. Then, specify the new monitoring target settings on the PFM - RM host that is currently operating as the executing node.

Before you update monitoring targets, check what information will be updated. For the information that will be updated, see [2.4.3 Updating monitoring targets](#).

To check the names of the monitoring targets, use the `jpccconf target list` command. To check the settings of the monitoring targets, use the `jpccconf target display` command. To update a monitoring target, use the `jpccconf target setup` command.



### Reference note

You do not need to stop the PFM - RM for Virtual Machine service before updating the monitoring targets.

The following shows the procedure for updating a single monitoring target. Repeat the procedure if you want to update multiple monitoring targets. To update a monitoring target:

#### 1. Check the names of the monitoring targets.

Execute the `jpccconf target list` command by specifying a service key, logical host name, and instance name. This identifies the PFM - RM for Virtual Machine instance that is monitoring the monitoring targets that you want to update.

For example, if you want to check the names of the hosts that are monitored by the PFM - RM for Virtual Machine instance whose logical host is `jp1_halvm` and instance name is `inst1`, execute the following command:

```
jpccconf target list -key RMVM -lhost jp1_halvm -inst inst1
```

The following shows an example of information displayed when the above command is executed.

Output example:

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

#### 2. Check the settings of the monitoring target.

Execute the `jpccconf target display` command by specifying the name of the monitoring-target host that you want to update, as well as the information that identifies the PFM - RM for Virtual Machine instance that is

monitoring the host. For the identification information, specify the service key, logical host name, and instance name of the PFM - RM for Virtual Machine instance.

For example, to display the settings of the host `targethost1` that is monitored by the instance `inst1` on the logical host `jpl_halvm`, execute the following command:

```
jpcconf target display -key RMVM -lhost jpl_halvm -inst inst1 -target targethost1
```

3. If the shared disk is offline, place it online from the cluster software or volume manager.

4. Execute the `jpcconf target setup` command by specifying the name of the monitoring-target host that you want to update, as well as the information that identifies the PFM - RM for Virtual Machine instance that is monitoring the host. For the identification information, specify the service key, logical host name, and instance name of the PFM - RM for Virtual Machine instance.

For example, to update the settings of host `targethost1` that is monitored by instance `inst1` on logical host `jpl_halvm`, execute the following command:

```
jpcconf target setup -key RMVM -lhost jpl_halvm -inst inst1 -target targethost1
```

Although the above `jpcconf target setup` command is executed in interactive mode, it can also be executed in non-interactive mode.

For how to execute the `jpcconf target setup` command in non-interactive mode, see [3.3.4\(6\) Setting up monitoring targets](#).

Note that if you execute the `jpcconf target setup` command in non-interactive mode, you can skip step 5.

5. Update the settings of the host monitored by PFM - RM for Virtual Machine.

Enter necessary information in response to the command's prompt. For the information that can be entered, see [2.4.3 Updating monitoring targets](#). The command sequentially displays the current values of settings (other than the password). For any value that you do not want to change, only press the **Enter** key. When all entries finish, the monitoring target is updated.



#### Important note

There are settings whose values cannot be changed. To update the values of these settings, delete all monitoring-target information, and then re-create it with new values.

## 3.6.3 Exporting and importing the logical host environment definition file

You only need to export and import the logical host environment definition file if one of the following operations has been executed.

- The node configurations on the logical host were changed during setup of the logical host, instance environment, or monitoring target.

For details about how to set up the logical host of PFM - RM for Virtual Machine, see the following subsection:

- [3.3.4\(3\) Setting up the logical host of PFM - RM for Virtual Machine](#)

For details about how to set up the instance environment, see the following subsection:

- [3.3.4\(5\) Setting up an instance environment](#)

For details about how to set up monitoring targets, see the following subsection:

- [3.3.4\(6\) Setting up monitoring targets](#)
- An operation that requires the exportation of the logical host environment definition file was executed during setup of the logical host of other Performance Management programs.

For details about how to set up the logical host of other Performance Management programs, see the following subsection:

- [3.3.4\(7\) Setting up the logical hosts of other Performance Management programs](#)
- A port number was set up when the network was being set up.

For details about how to set up the network, see the following subsection:

- [3.3.4\(9\) Setting up the network](#)

For details about how to export and import the logical host environment definition file, see the following subsections:

- [3.3.4\(15\) Exporting the logical host environment definition file](#) through [3.3.4\(18\) Importing the logical host environment definition file](#)

If only the instance environment and monitoring target was updated, there is no need to export or import the logical host environment definition file.

For details about how to update the instance environment and monitoring target, see [3.6.1 Updating the instance environment settings](#) and [3.6.2 Updating monitoring targets](#).

# 4

## Monitoring Template

This chapter explains the monitoring templates of PFM - RM for Virtual Machine.

## Overview of monitoring template

---

In Performance Management, you can define alarms and reports in the following ways:

- By using the alarms and reports defined in PFM - RM for Virtual Machine without modifying them
- By copying and customizing the alarms and reports defined in PFM - RM for Virtual Machine
- By using the wizard to define new alarms and reports

Alarms and reports provided by PFM - RM for Virtual Machine are called *monitoring templates*. Reports and alarms provided as monitoring templates already have the necessary information defined, and thus can be copied and used as is, or can be customized to suit the user environment. Therefore, without using the wizard to define new alarms and reports, you can easily prepare to monitor the operation status of the monitoring target.

This chapter explains the setting details of the alarms and reports that comprise the monitoring templates defined in PFM - RM for Virtual Machine.

For details on how to use monitoring templates, see the chapter that explains how to create reports for operation analysis or operation monitoring using alarms in the *Job Management Partner 1/Performance Management User's Guide*.



## Format of alarm explanations

---

The following explains the alarm description format. Alarms are listed in alphabetical order.

### Alarm name

Indicates the alarm name of a monitoring template.

### Overview

Provides an overview of the target that can be monitored by this alarm.

### Main settings

The main settings of this alarm are explained in a table. The table shows the correspondence between the alarm setting and the item that must be specified in the Properties window, which opens when you click first the alarm icon in the Alarms window of PFM - Web Console, and then the **Properties** method. To view detailed information about the settings for alarms, use the Properties window of that alarm in PFM - Web Console.

Two hyphens (--) in the *Setting* column signify that the setting is always invalid.

For *Conditional expression*, if the same setting is given for both an abnormal condition and a warning condition, an alarm event is issued only for the abnormal condition.


### Action to be taken

Describes the action to take when this alarm is issued, or points to the location where the action to take is explained.

### Alarm table

Indicates the alarm table in which this alarm's description is found.

### Related report

Indicates the report in the monitoring template related to this alarm. You can display this report by clicking the agent icon from the Agents window of PFM - Web Console, and then clicking the  icon displayed under the **Display Alarm Status** method.

## List of alarms

A table that lists and describes one or more alarms is called an *alarm table*. Alarms defined in a monitoring template of PFM - RM for Virtual Machine are stored in alarm table format in the `RM VirtualMachine` folder, which is displayed under the **Alarms** tab in PFM - Web Console.

An alarm table name is as expressed as follows.

- PFM RM VirtualMachine Template Alarms 10.00

*10.00 at the end of the alarm table name*

Indicates an alarm table version.

When you use an alarm that is defined in a monitoring template, check the version of the alarm table being used by the Performance Management system and its version compatibility. For details about the alarm table version and version compatibility, see [H. Version Compatibility](#).

The table below shows the alarms defined in the monitoring templates of PFM - RM for Virtual Machine.

Table 4–1: Alarm list

| Alarm name                 | Monitoring target                                      | Monitoring purpose                 |
|----------------------------|--------------------------------------------------------|------------------------------------|
| <i>Host Disk Usage</i>     | Logical disk usage in a physical server                | Operation status monitoring        |
| <i>Host Memory Usage</i>   | Memory usage in a physical server                      | Performance information monitoring |
| <i>VM CPU Insufficient</i> | CPU insufficiency in a virtual machine                 | Performance information monitoring |
| <i>VM Disk Abort Cmds</i>  | Number of discarded disk commands in a virtual machine | Operation status monitoring        |
| <i>VM Disk Usage</i>       | Logical disk usage in a virtual machine                | Operation status monitoring        |
| <i>VM Status</i>           | Virtual machine status                                 | Operation status monitoring        |

PFM - RM for Virtual Machine provides as monitoring templates an operating information monitoring alarm that monitors whether the system is operating normally, and a performance information monitoring alarm that monitors whether the system is providing sufficient services. Therefore, set the alarms that match your objectives.

# Host Disk Usage

## Overview

The Host Disk Usage alarm monitors the following item:

- For VMware, Hyper-V and KVM  
Logical disk usage (%) on the physical server

To monitor a specific logical disk, copy this alarm and create an alarm in which "\*" is replaced with the logical disk ID to be monitored.

## Main settings

| PFM - Web Console alarm properties |                                                              | Setting                                                                    |
|------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------------|
| Item                               | Detailed item                                                |                                                                            |
| Main Information                   | Product                                                      | RM VirtualMachine                                                          |
|                                    | Message                                                      | Host logical disk(%CVS1) is at %CVS2% utilization                          |
|                                    | Enable alarm                                                 | Selected                                                                   |
|                                    | Evaluate all data                                            | Not selected                                                               |
|                                    | Monitoring time range                                        | Always monitor                                                             |
|                                    | Report alarm when the following damping condition is reached | Selected                                                                   |
|                                    | Interval(s)                                                  | 3                                                                          |
|                                    | occurrence(s) during                                         | 2                                                                          |
| Action                             | Email                                                        | --                                                                         |
|                                    | Command                                                      | --                                                                         |
|                                    | SNMP                                                         | Abnormal, Warning, Normal                                                  |
| Conditional expression             | Record                                                       | Host Logical Disk Status (PI_HLDI)                                         |
|                                    | Field                                                        | <ul style="list-style-type: none"><li>• Disk ID</li><li>• Used %</li></ul> |
|                                    | Abnormal condition                                           | Disk ID = "*" AND<br>Used % >= 90                                          |
|                                    | Warning condition                                            | Disk ID = "*" AND<br>Used % >= 80                                          |

## Action to be taken

- For VMware  
See [1.4.5\(2\)\(b\) Example of monitoring the space usage of a physical server's logical disk.](#)
- For Hyper-V  
See [1.5.5\(2\)\(a\) Example of monitoring the space usage of a physical server's logical disk.](#)
- For KVM  
See [1.6.5\(2\)\(a\) Example of monitoring the space usage of a physical server's logical disk.](#)

## Alarm table

PFM RM VirtualMachine Template Alarms 10.00

## Related report

Reports/RM VirtualMachine/Status Reporting/Real-Time/Host Disk Used

# Host Memory Usage

## Overview

The Host Memory Usage alarm monitors the following item:

- For VMware, Hyper-V and KVM  
Memory usage (%) on the physical server

## Main settings

| PFM - Web Console alarm properties |                                                              | Setting                             |
|------------------------------------|--------------------------------------------------------------|-------------------------------------|
| Item                               | Detailed item                                                |                                     |
| Main Information                   | Product                                                      | RM VirtualMachine                   |
|                                    | Message                                                      | Host memory is at %CVS% utilization |
|                                    | Enable alarm                                                 | Selected                            |
|                                    | Evaluate all data                                            | Not selected                        |
|                                    | Monitoring time range                                        | Always monitor                      |
|                                    | Report alarm when the following damping condition is reached | Selected                            |
|                                    | Interval(s)                                                  | 3                                   |
|                                    | occurrence(s) during                                         | 2                                   |
| Action                             | Email                                                        | --                                  |
|                                    | Command                                                      | --                                  |
|                                    | SNMP                                                         | Abnormal, Warning, Normal           |
| Conditional expression             | Record                                                       | Host Memory Status (PI_HMI)         |
|                                    | Field                                                        | Total Used %                        |
|                                    | Abnormal condition                                           | Total Used % >= 120                 |
|                                    | Warning condition                                            | Total Used % >= 100                 |

## Action to be taken

- For VMware  
See [1.4.4\(2\)\(a\) Example of monitoring the total memory usage of a physical server.](#)
- For Hyper-V  
See [1.5.4\(2\)\(a\) Example of monitoring the total memory usage of a physical server.](#)
- For KVM  
See [1.6.4\(2\)\(a\) Example of monitoring the total memory usage of a physical server.](#)

## Alarm table

PFM RM VirtualMachine Template Alarms 10.00

## Related report

Reports/RM VirtualMachine/Troubleshooting/Recent Past/Host Memory Used

# VM CPU Insufficient

## Overview

The VM CPU Insufficient alarm monitors the following item:

- For VMware  
CPU insufficiency (%) on a virtual machine
- For Hyper-V and KVM  
This alarm is not available because the Insufficient % field is not supported.

This value approaches 0% if sufficient CPU resources are allocated to the virtual machine. To monitor a specific virtual machine, copy this alarm and create an alarm in which "\*" is replaced with the name of the virtual machine to be monitored.

## Main settings

| PFM - Web Console alarm properties |                                                              | Setting                                                                            |
|------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------|
| Item                               | Detailed item                                                |                                                                                    |
| Main Information                   | Product                                                      | RM VirtualMachine                                                                  |
|                                    | Message text                                                 | CPU insufficiency rate of %CVS1 is %CVS2%                                          |
|                                    | Enable alarm                                                 | Selected                                                                           |
|                                    | Evaluate all data                                            | Not selected                                                                       |
|                                    | Monitoring time range                                        | Always monitor                                                                     |
|                                    | Report alarm when the following damping condition is reached | Selected                                                                           |
|                                    | Interval(s)                                                  | 3                                                                                  |
|                                    | occurrence(s) during                                         | 2                                                                                  |
| Action                             | Email                                                        | --                                                                                 |
|                                    | Command                                                      | --                                                                                 |
|                                    | SNMP                                                         | Abnormal, Warning, Normal                                                          |
| Conditional expression             | Record                                                       | VM Status (PI_VI)                                                                  |
|                                    | Field                                                        | <ul style="list-style-type: none"><li>• VM Name</li><li>• Insufficient %</li></ul> |
|                                    | Abnormal condition                                           | VM Name = "*" AND<br>Insufficient % >= 30                                          |
|                                    | Warning condition                                            | VM Name = "*" AND<br>Insufficient % >= 10                                          |

## Action to be taken

- For VMware  
See [1.4.3\(2\)\(a\) Example of monitoring CPU insufficiency in a virtual machine.](#)

## Alarm table

PFM RM VirtualMachine Template Alarms 10.00

## Related report

Reports/RM VirtualMachine/Troubleshooting/Recent Past/VM CPU Insufficient



# VM Disk Abort Cmds

## Overview

The VM Disk Abort Cmds alarm monitors the following item:

- For VMware  
Number of discarded disk commands on a virtual machine
- For Hyper-V and KVM  
This alarm is not available because the Abort Commands is not supported.

To monitor a specific virtual machine, copy this alarm and create an alarm in which "\*" is replaced with the name of the virtual machine to be monitored.

## Main settings

| PFM - Web Console alarm properties |                                                              | Setting                                                                            |
|------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------|
| Item                               | Detailed item                                                |                                                                                    |
| Main Information                   | Product                                                      | RM VirtualMachine                                                                  |
|                                    | Message                                                      | Disk abort commands of %CVS1 is %CVS2                                              |
|                                    | Enable alarm                                                 | Selected                                                                           |
|                                    | Evaluate all data                                            | Not selected                                                                       |
|                                    | Monitoring time range                                        | Always monitor                                                                     |
|                                    | Report alarm when the following damping condition is reached | Selected                                                                           |
|                                    | Interval(s)                                                  | 3                                                                                  |
|                                    | occurrence(s) during                                         | 2                                                                                  |
| Action                             | Email                                                        | --                                                                                 |
|                                    | Command                                                      | --                                                                                 |
|                                    | SNMP                                                         | Abnormal, Warning, Normal                                                          |
| Conditional expression             | Record                                                       | VM Physical Disk Status (PI_VPDI)                                                  |
|                                    | Field                                                        | <ul style="list-style-type: none"><li>• VM Name</li><li>• Abort Commands</li></ul> |
|                                    | Abnormal condition                                           | VM Name = "*" AND<br>Abort Commands >= 10                                          |
|                                    | Warning condition                                            | VM Name = "*" AND<br>Abort Commands >= 1                                           |

## Action to be taken

- For VMware  
See [1.4.5\(2\)\(a\) Example of monitoring the disk command discarding rate of a physical disk being used by a virtual machine.](#)

## Alarm table

PFM RM VirtualMachine Template Alarms 10.00

## Related report

Reports/RM VirtualMachine/Monthly Trend/VM Disk Abort Commands

# VM Disk Usage

## Overview

The VM Disk Usage alarm monitors the following item:

- For VMware  
Logical disk usage (%) on a virtual machine
- For Hyper-V and KVM  
This alarm is not available because the VM Logical Disk Status (PI\_VLDI) record is not supported.

To monitor a specific logical disk or virtual machine, copy this alarm and create an alarm in which "\*" is replaced with the logical disk ID or the name of the virtual machine to be monitored.

## Main settings

| PFM - Web Console alarm properties |                                                              | Setting                                                                                      |
|------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Item                               | Detailed item                                                |                                                                                              |
| Main Information                   | Product                                                      | RM VirtualMachine                                                                            |
|                                    | Message                                                      | Logical disk of %CVS1 is at %CVS3% utilization                                               |
|                                    | Enable alarm                                                 | Selected                                                                                     |
|                                    | Evaluate all data                                            | Not selected                                                                                 |
|                                    | Monitoring time range                                        | Always monitor                                                                               |
|                                    | Report alarm when the following damping condition is reached | Selected                                                                                     |
|                                    | Interval(s)                                                  | 3                                                                                            |
|                                    | occurrence(s) during                                         | 2                                                                                            |
| Action                             | Email                                                        | --                                                                                           |
|                                    | Command                                                      | --                                                                                           |
|                                    | SNMP                                                         | Abnormal, Warning, Normal                                                                    |
| Conditional expression             | Record                                                       | VM Logical Disk Status (PI_VLDI)                                                             |
|                                    | Field                                                        | <ul style="list-style-type: none"><li>• VM Name</li><li>• Disk ID</li><li>• Used %</li></ul> |
|                                    | Abnormal condition                                           | VM Name = "*" AND<br>Disk ID = "*" AND<br>Used % >= 90                                       |
|                                    | Warning condition                                            | VM Name = "*" AND<br>Disk ID = "*" AND<br>Used % >= 80                                       |

## Action to be taken

- For VMware

See *1.4.5(2)(c) Example of monitoring the space usage of a virtual machine's logical disk.*

**Alarm table**

PFM RM VirtualMachine Template Alarms 10.00

**Related report**

Reports/RM VirtualMachine/Status Reporting/Real-Time/VM Disk Used

# VM Status

## Overview

The VM Status alarm monitors the following item:

- For VMware, Hyper-V and KVM  
Virtual machine status

To monitor a specific virtual machine, copy this alarm and create an alarm in which "\*" is replaced with the name of the virtual machine to be monitored.

## Main settings

| PFM - Web Console alarm properties |                                                                     | Setting                                                                    |
|------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------|
| Item                               | Detailed item                                                       |                                                                            |
| <b>Main Information</b>            | <b>Product</b>                                                      | RM VirtualMachine                                                          |
|                                    | <b>Message</b>                                                      | Virtual machine(%CVS1) not available                                       |
|                                    | <b>Enable alarm</b>                                                 | Selected                                                                   |
|                                    | <b>Evaluate all data</b>                                            | Not selected                                                               |
|                                    | <b>Monitoring time range</b>                                        | <b>Always monitor</b>                                                      |
|                                    | <b>Report alarm when the following damping condition is reached</b> | Selected                                                                   |
|                                    | <b>Interval(s)</b>                                                  | 3                                                                          |
|                                    | <b>occurrence(s) during</b>                                         | 2                                                                          |
| <b>Action</b>                      | <b>Email</b>                                                        | --                                                                         |
|                                    | <b>Command</b>                                                      | --                                                                         |
|                                    | <b>SNMP</b>                                                         | <b>Abnormal, Warning, Normal</b>                                           |
| <b>Conditional expression</b>      | <b>Record</b>                                                       | VM Status Detail (PD_VM)                                                   |
|                                    | <b>Field</b>                                                        | <ul style="list-style-type: none"><li>• VM Name</li><li>• Status</li></ul> |
|                                    | <b>Abnormal condition</b>                                           | VM Name = "*" AND<br>Status <> "ON"                                        |
|                                    | <b>Warning condition</b>                                            | VM Name = "*" AND<br>Status <> "ON"                                        |

## Action to be taken

- For VMware, Hyper-V and KVM  
When this alarm is issued, check if the virtual machine is running.

## Alarm table

PFM RM VirtualMachine Template Alarms 10.00

## Related report

None

## Format of report explanations

---

This section explains the report description format. Reports are presented in alphabetical order.

### Report name

Indicates the report name of a monitoring template.

If a report name includes `(Multi-Agent)`, that report displays information about multiple instances.

If a report name does not include `(Multi-Agent)`, that report displays information about a single instance.

For details about data models, see [5. Records](#).

### Overview

Provides an overview of the information that can be displayed in the report.

### Storage location

Indicates the location at which the report is stored.

### Record

Indicates the record in which the performance data used by the report is stored. To display a historical report, you must specify collection of the record indicated in this section in advance. Before displaying the report, display the properties of the agent in the Agents window of PFM - Web Console, and make sure that `Log = Yes` is set for this record. This setting is not required for a real-time report.

### Fields

The record fields used in the report are presented in a table.

### Drilldown report (field level)

The reports in the monitoring template that are associated with the fields used in this report are presented in a table. To display this drilldown report, click the report graph displayed in the Report window of PFM - Web Console or the field name displayed at the bottom of the Report window. For a historical report, by clicking a time displayed in blue inside the report, you can display a report in more detailed time intervals. Note that some reports have a drilldown report while others do not.

For details about drilldown reports, see the chapter that explains creation of reports for operational analysis in the *Job Management Partner 1/Performance Management User's Guide*.

## Organization of report folders

The folder structure of a report in PFM - RM for Virtual Machine is shown below. The item inside < > indicates a folder name.

```
<RM VirtualMachine>
+-- <Monthly Trend>
|   +-- <Host CPU Used Status>
|   +-- <Host Disk Used>
|   +-- <Host Memory Used>
|   +-- <Host Network Data>
|   +-- <VM CPU Insufficient>
|   +-- <VM Disk Abort Commands>
|   +-- <VM Disk Used>
|   +-- <VM Network Data>
+-- <Status Reporting>
|   +-- <Daily Trend>
|   |   +-- <Host CPU Used Status>
|   |   +-- <Host Memory Used>
|   |   +-- <VM CPU Insufficient>
|   +-- <Real-Time>
|   |   +-- <Host Disk Used>
|   |   +-- <VM Disk Abort Commands>
|   |   +-- <VM Disk Used>
+-- <Troubleshooting>
|   +-- <Real-Time>
|   |   +-- <Host CPU Used Status>
|   |   +-- <Host Disk I/O>
|   |   +-- <Host Disk Used Status>
|   |   +-- <Host Memory Size>
|   |   +-- <Host Memory Used>
|   |   +-- <Host Memory Used Status>
|   |   +-- <Host Network Data>
|   |   +-- <VM CPU Allocation Value>
|   |   +-- <VM CPU Insufficient>
|   |   +-- <VM CPU Used>
|   |   +-- <VM Disk I/O>
|   |   +-- <VM Disk Used Status>
|   |   +-- <VM Memory Allocation Value>
|   |   +-- <VM Network Data>
|   |   +-- <VM Swap Used>
|   |   +-- <VM Working Size - Total>
|   +-- <Recent Past>
|   |   +-- <Host CPU Used Status>
|   |   +-- <Host Disk I/O>
|   |   +-- <Host Memory Size>
|   |   +-- <Host Memory Used>
|   |   +-- <Host Memory Used Status>
|   |   +-- <VM CPU Allocation Value>
|   |   +-- <VM CPU Insufficient>
|   |   +-- <VM CPU Used>
|   |   +-- <VM Disk I/O>
|   |   +-- <VM Memory Allocation Value>
|   |   +-- <VM Swap Used>
|   |   +-- <VM Working Size - Total>
|   +-- <Drilldown Only>
```



```
+-- <VM CPU Used Status>
+-- <VM Memory Used>
+-- <VM Memory Used Status>
```

The following describes each folder.

- **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.

- **Status Reporting folder**

This folder contains reports that display daily information. Use the reports in this folder to check the overall status of the system. You can display real-time reports as well as historical reports.

- **Daily Trend folder**

This folder contains historical 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.

- **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 have the following folders under them. The folders that are located below them depend on the higher-order folder. These folders are explained below.

- **Drilldown Only folder**

This folder stores the report that is displayed as a drilldown report (field level). Use this folder to display the detailed information related to that report field.

## List of reports

The table below alphabetically lists the reports defined as monitoring templates.

Table 4–2: Report list

Category	Report name	Information to be displayed
CPU	<i>Host CPU Used Status</i>	Displays the CPU usage status of a physical server.
	<i>VM CPU Allocation Value</i>	Displays the CPU allocation upper limit of a virtual machine.
	<i>VM CPU Insufficient</i>	Displays the CPU insufficiency of a virtual machine.
	<i>VM CPU Used</i>	Displays the CPU usage of a virtual machine.
	<i>VM CPU Used Status</i>	Displays the CPU usage status of a physical server by a virtual machine.
Disk	<i>Host Disk I/O</i>	Displays the physical disk I/O of a physical server.
	<i>Host Disk Used</i>	Displays the logical disk usage of a physical server.
	<i>Host Disk Used Status</i>	Displays the logical disk usage status of a physical server.
	<i>VM Disk Abort Commands</i>	Displays the disk command-discarding rate of a virtual machine.
	<i>VM Disk I/O</i>	Displays the disk I/O of a virtual machine.
	<i>VM Disk Used</i>	Displays the logical disk usage of a virtual machine.
	<i>VM Disk Used Status</i>	Displays the logical disk usage status of a virtual machine.
Memory	<i>Host Memory Size</i>	Displays the total physical memory size of a physical server.
	<i>Host Memory Used</i>	Displays the memory resource usage of a physical server.
	<i>Host Memory Used Status</i>	Displays the memory resource usage status of a physical server.
	<i>VM Memory Allocation Value</i>	Displays the memory allocation upper limit of a virtual machine.
	<i>VM Memory Used</i>	Displays the memory resources used by a virtual machine.
	<i>VM Memory Used Status</i>	Displays the memory resource usage status of a virtual machine.
	<i>VM Swap Used</i>	Displays the swap usage of a virtual machine.
	<i>VM Working Size - Total</i>	Displays the working set size of all virtual machines.
Network	<i>Host Network Data</i>	Displays the volume of network data sent/received by a physical server.
	<i>VM Network Data</i>	Displays the volume of network data sent/received by a virtual machine.

*Note:*

Some records and fields may not be supported, depending on the virtual environment being monitored. This means that a report that consists of such records or fields might not be available. For details about the support status of records and fields, see the section that explains each record in [5. Records](#).

## Host CPU Used Status (Monthly Trend)

---

### Overview

The Host CPU Used Status report displays the CPU usage status of a physical server over the past month in daily summaries, in table and stacked area graph formats.

### Storage location

Reports/RM VirtualMachine/Monthly Trend/

### Record

Host Status (PI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Clocks	CPU resource clock frequency (MHz)
Count	Physical CPU core count
VM Used	CPU resources used by VM (MHz)
VMM Kernel Used	<ul style="list-style-type: none"><li>For VMware and KVM CPU resources used by VMM kernel (MHz)</li></ul>
VMM Console Used	CPU resources used by VMM console (MHz)
VMM Others Used	<ul style="list-style-type: none"><li>For VMware and KVM CPU resources used by VMM and others (MHz)</li></ul>
Unused	CPU resources unused (MHz)

## Host CPU Used Status (Status Reporting/Daily Trend)

---

### Overview

The Host CPU Used Status report displays the CPU usage status of a physical server over the past day in hourly summaries, in table and stacked area graph formats.

### Storage location

Reports/RM VirtualMachine/Status Reporting/Daily Trend/

### Record

Host Status (PI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Clocks	CPU resource clock frequency (MHz)
Count	Physical CPU core count
VM Used	CPU resources used by VM (MHz)
VMM Kernel Used	<ul style="list-style-type: none"><li>For VMware and KVM CPU resources used by VMM kernel (MHz)</li></ul>
VMM Console Used	CPU resources used by VMM console (MHz)
VMM Others Used	<ul style="list-style-type: none"><li>For VMware and KVM CPU resources used by VMM and others (MHz)</li></ul>
Unused	CPU resources unused (MHz)

# Host CPU Used Status (Troubleshooting/Real-Time)

---

## Overview

The Host CPU Used Status report displays the CPU usage status of a physical server on a real-time basis, in list and stacked area graph formats.

## Storage location

Reports/RM VirtualMachine/Troubleshooting/Real-Time/

## Record

Host Status (PI)

## Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Clocks	CPU resource clock frequency (MHz)
Count	Physical CPU core count
VM Used	CPU resources used by VM (MHz)
VMM Kernel Used	<ul style="list-style-type: none"><li>For VMware and KVM CPU resources used by VMM kernel (MHz)</li></ul>
VMM Console Used	CPU resources used by VMM console (MHz)
VMM Others Used	<ul style="list-style-type: none"><li>For VMware and KVM CPU resources used by VMM and others (MHz)</li></ul>
Unused	CPU resources unused (MHz)

## Host CPU Used Status (Troubleshooting/Recent Past)

---

### Overview

The Host CPU Used Status report displays the CPU usage status of a physical server over the past hour in minute-by-minute summaries, in table and stacked area graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Recent Past/

### Record

Host Status (PI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Clocks	CPU resource clock frequency (MHz)
Count	Physical CPU core count
VM Used	CPU resources used by VM (MHz)
VMM Kernel Used	<ul style="list-style-type: none"><li>For VMware and KVM CPU resources used by VMM kernel (MHz)</li></ul>
VMM Console Used	CPU resources used by VMM console (MHz)
VMM Others Used	<ul style="list-style-type: none"><li>For VMware and KVM CPU resources used by VMM and others (MHz)</li></ul>
Unused	CPU resources unused (MHz)

### Drilldown report (field level)

Report name	Explanation
VM CPU Used Status	Displays the CPU usage status of a physical server by the selected virtual machine. To display this report, click the VM Used field.

## Host Disk I/O (Troubleshooting/Real-Time)

---

### Overview

The Host Disk I/O report displays the physical disk I/O of a physical server on a real-time basis, in list and line graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Real-Time/

### Record

Host Physical Disk Status (PI\_HPDI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Disk ID	Disk ID
Speed	Data transfer speed (KB/sec)
Requests	<ul style="list-style-type: none"><li>For VMware, Hyper-V and KVM Processing count</li></ul>
Read Requests	Read request count
Read Speed	Read data transfer speed (KB/sec)
Write Requests	Write request count
Write Speed	Write data transfer speed (KB/sec)

## Host Disk I/O (Troubleshooting/Recent Past)

---

### Overview

The Host Disk I/O report displays the physical disk I/O of a physical server over the past hour in minute-by-minute summaries, in table and line graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Recent Past/

### Record

Host Physical Disk Status (PI\_HPDI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Disk ID	Disk ID
Speed	Data transfer speed (KB/sec)
Requests	<ul style="list-style-type: none"><li>For VMware, Hyper-V and KVM Processing count</li></ul>
Read Requests	Read request count
Read Speed	Read data transfer speed (KB/sec)
Write Requests	Write request count
Write Speed	Write data transfer speed (KB/sec)



## Host Disk Used (Monthly Trend)

---

### Overview

The `Host Disk Used` report displays the logical disk usage of a physical server over the past month in daily summaries, in table and line graph formats.

### Storage location

Reports/RM VirtualMachine/Monthly Trend/

### Record

Host Logical Disk Status (PI\_HLDI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Disk ID	Disk ID
Used	Size of disk space used (MB)
Used %	Disk usage (%)
Free	Size of disk space unused (MB)
Size	Disk size (MB)

## Host Disk Used (Status Reporting/Real-Time)

---

### Overview

The `Host Disk Used` report displays the logical disk usage of a physical server on a real-time basis, in list and line graph formats.

### Storage location

Reports/RM VirtualMachine/Status Reporting/Real-Time/

### Record

Host Logical Disk Status (PI\_HLDI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Disk ID	Disk ID
Used	Size of disk space used (MB)
Used %	Disk usage (%)
Free	Size of disk space unused (MB)
Size	Disk size (MB)

## Host Disk Used Status (Troubleshooting/Real-Time)

---

### Overview

The `Host Disk Used Status` report displays the logical disk usage status of a physical server on a real-time basis, in list and stacked column graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Real-Time/

### Record

Host Logical Disk Status (PI\_HLDI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Disk ID	Disk ID
Used	Size of disk space used (MB)
Used %	Disk usage (%)
Free	Size of disk space unused (MB)
Size	Disk size (MB)

## Host Memory Size (Troubleshooting/Real-Time)

---

### Overview

The `Host Memory Size` report displays the total size of physical memory in a physical server on a real-time basis, in list and line graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Real-Time/

### Record

Host Memory Status (PI\_HMI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Size	Memory resource size (MB)
Used %	<ul style="list-style-type: none"><li>For VMware, Hyper-V and KVM Memory resource usage (%)</li></ul>
VMM Used %	<ul style="list-style-type: none"><li>For VMware and KVM Memory resources used by VMM (%)</li></ul>
VM Used %	<ul style="list-style-type: none"><li>For VMware and KVM Memory resources used by VM (%)</li></ul>

## Host Memory Size (Troubleshooting/Recent Past)

---

### Overview

The `Host Memory Size` report displays the total size of physical memory of a physical server over the past hour in minute-by-minute summaries, in table and line graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Recent Past/

### Record

Host Memory Status (PI\_HMI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Size	Memory resource size (MB)
Used %	<ul style="list-style-type: none"><li>For VMware, Hyper-V and KVM Memory resource usage (%)</li></ul>
VMM Used %	<ul style="list-style-type: none"><li>For VMware and KVM Memory resources used by VMM (%)</li></ul>
VM Used %	<ul style="list-style-type: none"><li>For VMware and KVM Memory resources used by VM (%)</li></ul>

## Host Memory Used (Monthly Trend)

---

### Overview

The `Host Memory Used` report displays the memory resource usage of a physical server over the past month in daily summaries, in table and stacked area graph formats.

### Storage location

Reports/RM VirtualMachine/Monthly Trend/

### Record

Host Memory Status (PI\_HMI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Used	<ul style="list-style-type: none"><li>For VMware, Hyper-V and KVM Memory resource usage (MB)</li></ul>
Used %	<ul style="list-style-type: none"><li>For VMware, Hyper-V and KVM Memory resource usage (%)</li></ul>
VM Swap Used	Internal swap used (MB)
VM Swap Used %	Internal swap usage (%)
Host Swap Used	External swap used (MB)
Host Swap Used %	External swap usage (%)
Unused	Memory resources unused (MB)

## Host Memory Used (Status Reporting/Daily Trend)

---

### Overview

The `Host Memory Used` report displays the memory resource usage of a physical server over the past day in hourly summaries, in table and stacked area graph formats.

### Storage location

Reports/RM VirtualMachine/Status Reporting/Daily Trend/

### Record

Host Memory Status (PI\_HMI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Used	<ul style="list-style-type: none"><li>For VMware, Hyper-V and KVM Memory resource usage (MB)</li></ul>
Used %	<ul style="list-style-type: none"><li>For VMware, Hyper-V and KVM Memory resource usage (%)</li></ul>
VM Swap Used	Internal swap used (MB)
VM Swap Used %	Internal swap usage (%)
Host Swap Used	External swap used (MB)
Host Swap Used %	External swap usage (%)
Unused	Memory resources unused (MB)

# Host Memory Used (Troubleshooting/Real-Time)

---

## Overview

The `Host Memory Used` report displays the memory resource usage of a physical server on a real-time basis, in list and stacked area graph formats.

## Storage location

Reports/RM VirtualMachine/Troubleshooting/Real-Time/

## Record

Host Memory Status (PI\_HMI)

## Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Used	<ul style="list-style-type: none"><li>For VMware, Hyper-V and KVM Memory resource usage (MB)</li></ul>
Used %	<ul style="list-style-type: none"><li>For VMware, Hyper-V and KVM Memory resource usage (%)</li></ul>
VM Swap Used	Internal swap used (MB)
VM Swap Used %	Internal swap usage (%)
Host Swap Used	External swap used (MB)
Host Swap Used %	External swap usage (%)
Unused	Memory resources unused (MB)



## Host Memory Used (Troubleshooting/Recent Past)

---

### Overview

The `Host Memory Used` report displays the memory resource usage of a physical server over the past hour in minute-by-minute summaries, in table and stacked area graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Recent Past/

### Record

Host Memory Status (PI\_HMI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Used	<ul style="list-style-type: none"><li>For VMware, Hyper-V and KVM Memory resource usage (MB)</li></ul>
Used %	<ul style="list-style-type: none"><li>For VMware, Hyper-V and KVM Memory resource usage (%)</li></ul>
VM Swap Used	Internal swap used (MB)
VM Swap Used %	Internal swap usage (%)
Host Swap Used	External swap used (MB)
Host Swap Used %	External swap usage (%)
Unused	Memory resources unused (MB)

# Host Memory Used Status (Troubleshooting/Real-Time)

---

## Overview

The `Host Memory Used Status` report displays the memory resource usage status of a physical server on a real-time basis, in list and stacked area graph formats.

## Storage location

Reports/RM VirtualMachine/Troubleshooting/Real-Time/

## Record

Host Memory Status (PI\_HMI)

## Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Used	<ul style="list-style-type: none"><li>For VMware, Hyper-V and KVM Memory resource usage (MB)</li></ul>
Used %	<ul style="list-style-type: none"><li>For VMware, Hyper-V and KVM Memory resource usage (%)</li></ul>
Host Swap Used	External swap used (MB)
Host Swap Used %	External swap usage (%)
VM Swap Used	Internal swap used (MB)
VM Swap Used %	Internal swap usage (%)
Unused	Memory resources unused (MB)

## Host Memory Used Status (Troubleshooting/Recent Past)

---

### Overview

The Host Memory Used Status report displays the memory resource usage status of a physical server over the past hour in minute-by-minute summaries, in table and stacked area graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Recent Past/

### Record

Host Memory Status (PI\_HMI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Used	<ul style="list-style-type: none"><li>For VMware, Hyper-V and KVM Memory resource usage (MB)</li></ul>
Used %	<ul style="list-style-type: none"><li>For VMware, Hyper-V and KVM Memory resource usage (%)</li></ul>
Host Swap Used	External swap used (MB)
Host Swap Used %	External swap usage (%)
VM Swap Used	Internal swap used (MB)
VM Swap Used %	Internal swap usage (%)
Unused	Memory resources unused (MB)

### Drilldown report (field level)

Report name	Explanation
VM Memory Used	Displays the memory resource usage by the selected virtual machine. To display this report, click the Used field.

## Host Network Data (Monthly Trend)

---

### Overview

The Host Network Data report displays the volume of network data sent/received by a physical server over the past month in daily summaries, in table and line graph formats.

### Storage location

Reports/RM VirtualMachine/Monthly Trend/

### Record

Host Network Status (PI\_HNI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Net ID	Network ID
Rate	Speed at which the physical server sends data to or receives data from the network (KB/sec)
Recv Rate	Speed at which the physical server receives data from the network (KB/sec)
Send Rate	Speed at which the physical server sends data to the network (KB/sec)

## Host Network Data (Troubleshooting/Real-Time)

---

### Overview

The Host Network Data report displays the volume of network data sent/received by a physical server on a real-time basis, in list and line graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Real-Time/

### Record

Host Network Status (PI\_HNI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
Net ID	Network ID
Rate	Speed at which the physical server sends data to or receives data from the network (KB/sec)
Recv Rate	Speed at which the physical server receives data from the network (KB/sec)
Send Rate	Speed at which the physical server sends data to the network (KB/sec)

# VM CPU Allocation Value (Troubleshooting/Real-Time)

---

## Overview

The VM CPU Allocation Value report displays the CPU allocation upper limit of a virtual machine on a real-time basis, in list and summary bar graph formats.

## Storage location

Reports/RM VirtualMachine/Troubleshooting/Real-Time/

## Record

VM Status (PI\_VI)

## Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Expectation	CPU allocation balancing value (MHz)
Expectation %	CPU allocation balancing point (%)
Max	CPU allocation upper limit value (MHz)
Max %	CPU allocation upper limit rate (%)
Min	CPU allocation lower limit value (MHz)
Min %	CPU allocation lower limit rate (%)
Share	CPU allocation share

## VM CPU Allocation Value (Troubleshooting/Recent Past)

---

### Overview

The VM CPU Allocation Value report displays the CPU allocation upper limit of a virtual machine over the past hour in minute-by-minute summaries, in table and summary bar graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Recent Past/

### Record

VM Status (PI\_VI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Expectation	CPU allocation balancing value (MHz)
Expectation %	CPU allocation balancing point (%)
Max	CPU allocation upper limit value (MHz)
Max %	CPU allocation upper limit rate (%)
Min	CPU allocation lower limit value (MHz)
Min %	CPU allocation lower limit rate (%)
Share	CPU allocation share

## VM CPU Insufficient (Monthly Trend)

---

### Overview

The `VM CPU Insufficient` report displays the CPU insufficiency of a virtual machine over the past month in daily summaries, in table and line graph formats.

### Storage location

Reports/RM VirtualMachine/Monthly Trend/

### Record

VM Status (PI\_VI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Insufficient	CPU insufficiency (MHz)
Insufficient %	CPU insufficiency rate (%)
Used	CPU usage (MHz)
Used %	CPU usage rate (%)
Request %	CPU request rate (%)
Used Per Request	CPU allocated rate (%)
Insufficient Per Request	CPU unallocated rate (%)



## VM CPU Insufficient (Status Reporting/Daily Trend)

---

### Overview

The `VM CPU Insufficient` report displays the CPU insufficiency of a virtual machine over the past day in hourly summaries, in table and line graph formats.

### Storage location

Reports/RM VirtualMachine/Status Reporting/Daily Trend/

### Record

VM Status (PI\_VI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Insufficient	CPU insufficiency (MHz)
Insufficient %	CPU insufficiency rate (%)
Used	CPU usage (MHz)
Used %	CPU usage rate (%)
Request %	CPU request rate (%)
Used Per Request	CPU allocated rate (%)
Insufficient Per Request	CPU unallocated rate (%)

## VM CPU Insufficient (Troubleshooting/Real-Time)

---

### Overview

The `VM CPU Insufficient` report displays the CPU insufficiency of a virtual machine on a real-time basis, in list and line graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Real-Time/

### Record

VM Status (PI\_VI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Insufficient	CPU insufficiency (MHz)
Insufficient %	CPU insufficiency rate (%)
Used	CPU usage (MHz)
Used %	CPU usage rate (%)
Request %	CPU request rate (%)
Used Per Request	CPU allocated rate (%)
Insufficient Per Request	CPU unallocated rate (%)

## VM CPU Insufficient (Troubleshooting/Recent Past)

---

### Overview

The `VM CPU Insufficient` report displays the CPU insufficiency of a virtual machine over the past hour in minute-by-minute summaries, in table and line graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Recent Past/

### Record

VM Status (PI\_VI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Insufficient	CPU insufficiency (MHz)
Insufficient %	CPU insufficiency rate (%)
Used	CPU usage (MHz)
Used %	CPU usage rate (%)
Request %	CPU request rate (%)
Used Per Request	CPU allocated rate (%)
Insufficient Per Request	CPU unallocated rate (%)

# VM CPU Used (Troubleshooting/Real-Time)

---

## Overview

The VM CPU Used report displays the CPU usage of a virtual machine on a real-time basis, in list and summary bar graph formats.

## Storage location

Reports/RM VirtualMachine/Troubleshooting/Real-Time/

## Record

VM Status (PI\_VI)

## Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Used	CPU usage (MHz)
Used %	CPU usage rate (%)
Insufficient	CPU insufficiency (MHz)
Insufficient %	CPU insufficiency rate (%)
Expectation	CPU allocation balancing value (MHz)
Max	CPU allocation upper limit value (MHz)
Min	CPU allocation lower limit value (MHz)

## VM CPU Used (Troubleshooting/Recent Past)

---

### Overview

The VM CPU Used report displays the CPU usage of a virtual machine over the past hour in minute-by-minute summaries, in table and summary bar graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Recent Past/

### Record

VM Status (PI\_VI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Used	CPU usage (MHz)
Used %	CPU usage rate (%)
Insufficient	CPU insufficiency (MHz)
Insufficient %	CPU insufficiency rate (%)
Expectation	CPU allocation balancing value (MHz)
Max	CPU allocation upper limit value (MHz)
Min	CPU allocation lower limit value (MHz)

## VM CPU Used Status (Troubleshooting/Recent Past/Drilldown Only)

---

### Overview

The VM CPU Used Status report displays the CPU usage status of a physical server by a virtual machine over the past hour in minute-by-minute summaries, in table and stacked column graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Recent Past/Drilldown Only/

### Record

VM Status (PI\_VI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Used	CPU usage (MHz)
Used %	CPU usage rate (%)

## VM Disk Abort Commands (Monthly Trend)

---

### Overview

The `VM Disk Abort Commands` report displays the disk-command discarding rate of a virtual machine over the past month in daily summaries, in table and line graph formats.

### Storage location

Reports/RM VirtualMachine/Monthly Trend/

### Record

VM Physical Disk Status (PI\_VPDI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Disk ID	Disk ID
Abort Commands	Number of disk commands discarded
Abort Commands %	Disk-command discarding rate (%)
Commands	Number of disk commands issued

## VM Disk Abort Commands (Status Reporting/Real-Time)

---

### Overview

The `VM Disk Abort Commands` report displays the disk-command discarding rate of a virtual machine on a real-time basis, in list and line graph formats.

### Storage location

`Reports/RM VirtualMachine/Status Reporting/Real-Time/`

### Record

VM Physical Disk Status (PI\_VPDI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Disk ID	Disk ID
Abort Commands	Number of disk commands discarded
Abort Commands %	Disk-command discarding rate (%)
Commands	Number of disk commands issued



## VM Disk I/O (Troubleshooting/Real-Time)

---

### Overview

The VM Disk I/O report displays the disk I/O of a virtual machine on a real-time basis, in list and line graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Real-Time/

### Record

VM Physical Disk Status (PI\_VPDI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Disk ID	Disk ID
Speed	Data transfer speed (KB/sec)
Requests	Request count
Read Requests	Read request count
Read Speed	Read data transfer speed (KB/sec)
Write Requests	Write request count
Write Speed	Write data transfer speed (KB/sec)

## VM Disk I/O (Troubleshooting/Recent Past)

---

### Overview

The VM Disk I/O report displays the disk I/O operations of a virtual machine over the past hour in minute-by-minute summaries, in table and line graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Recent Past/

### Record

VM Physical Disk Status (PI\_VPDI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Disk ID	Disk ID
Speed	Data transfer speed (KB/sec)
Requests	Processing count
Read Requests	Read request count
Read Speed	Read data transfer speed (KB/sec)
Write Requests	Write request count
Write Speed	Write data transfer speed (KB/sec)

## VM Disk Used (Monthly Trend)

---

### Overview

The `VM Disk Used` report displays the logical disk usage of a virtual machine over the past month in daily summaries, in table and line graph formats.

### Storage location

Reports/RM VirtualMachine/Monthly Trend/

### Record

VM Logical Disk Status (PI\_VLDI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Disk ID	Disk ID
Used	Size of disk space used (MB)
Used %	Disk usage (%)
Free	Size of disk space unused (MB)
Size	Disk size (MB)

## VM Disk Used (Status Reporting/Real-Time)

---

### Overview

The `VM Disk Used` report displays the logical disk usage of a virtual machine on a real-time basis, in list and line graph formats.

### Storage location

Reports/RM VirtualMachine/Status Reporting/Real-Time/

### Record

VM Logical Disk Status (PI\_VLDI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Disk ID	Disk ID
Used	Size of disk space used (MB)
Used %	Disk usage (%)
Free	Size of disk space unused (MB)
Size	Disk size (MB)

# VM Disk Used Status (Troubleshooting/Real-Time)

---

## Overview

The VM Disk Used Status report displays the logical disk usage status of a virtual machine on a real-time basis, in list and stacked bar graph formats.

## Storage location

Reports/RM VirtualMachine/Troubleshooting/Real-Time/

## Record

VM Logical Disk Status (PI\_VLDI)

## Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Disk ID	Disk ID
Used	Size of disk space used (MB)
Used %	Disk usage (%)
Free	Size of disk space unused (MB)
Size	Disk size (MB)

# VM Memory Allocation Value (Troubleshooting/Real-Time)

---

## Overview

The VM Memory Allocation Value report displays the memory allocation upper limit of a virtual machine on a real-time basis, in list and summary bar graph formats.

## Storage location

Reports/RM VirtualMachine/Troubleshooting/Real-Time/

## Record

VM Memory Status (PI\_VMI)

## Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Expectation	Memory allocation balancing value (MB)
Expectation %	Memory allocation balancing point (%)
Max	Memory allocation upper limit value (MB)
Max %	Memory allocation upper limit rate (%)
Min	Memory allocation lower limit value (MB)
Min %	Memory allocation lower limit rate (%)
Size	Memory size (MB)
Share	Memory allocation share

## VM Memory Allocation Value (Troubleshooting/Recent Past)

---

### Overview

The VM Memory Allocation Value report displays the memory allocation upper limit of a virtual machine over the past hour in minute-by-minute summaries, in table and summary bar graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Recent Past/

### Record

VM Memory Status (PI\_VMI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Expectation	Memory allocation balancing value (MB)
Expectation %	Memory allocation balancing point (%)
Max	Memory allocation upper limit value (MB)
Max %	Memory allocation upper limit rate (%)
Min	Memory allocation lower limit value (MB)
Min %	Memory allocation lower limit rate (%)
Size	Memory size (MB)
Share	Memory allocation share

## VM Memory Used (Troubleshooting/Recent Past/Drilldown Only)

### Overview

The `VM Memory Used` report displays the memory resource used by a virtual machine over the past hour in minute-by-minute summaries, in table and line graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Recent Past/Drilldown Only/

### Record

VM Memory Status (PI\_VMI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Used	Memory usage volume (MB)
Used %	Memory usage rate (%)
Host Swap Used	External swap used (MB)
Host Swap Used %	External swap usage (%)
VM Swap Used	Internal swap used (MB)
VM Swap Used %	Internal swap usage (%)
Unused	Memory unused (MB)
Working Size	Working set size (MB)
Working Size %	Working set size rate (%)

### Drilldown report (field level)

Report name	Explanation
VM Memory Used Status	Displays the memory resource usage status by the selected virtual machine. To display this report, click the VM Name field.



## VM Memory Used Status (Troubleshooting/Recent Past/Drilldown Only)

### Overview

The VM Memory Used Status report displays the memory resource usage status of a virtual machine over the past hour in minute-by-minute summaries, in table and stacked bar graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Recent Past/Drilldown Only/

### Record

VM Memory Status (PI\_VMI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Used	Memory usage volume (MB)
Used %	Memory usage rate (%)
Host Swap Used	External swap used (MB)
Host Swap Used %	External swap usage (%)
VM Swap Used	Internal swap used (MB)
VM Swap Used %	Internal swap usage (%)
Working Size	Working set size (MB)
Working Size %	Working set size rate (%)
Unused	Memory unused (MB)

## VM Network Data (Monthly Trend)

---

### Overview

The `VM Network Data` report displays the volume of network data sent/received by a virtual machine over the past month in daily summaries, in table and line graph formats.

### Storage location

Reports/RM VirtualMachine/Monthly Trend/

### Record

VM Network Status (PI\_VNI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Net ID	Network ID
Rate	Speed at which the physical server sends data to or receives data from the network (KB/sec)
Recv Rate	Speed at which the physical server receives data from the network (KB/sec)
Send Rate	Speed at which the physical server sends data to the network (KB/sec)

## VM Network Data (Troubleshooting/Real-Time)

---

### Overview

The VM Network Data report displays the volume of network data sent/received by a virtual machine on a real-time basis, in list and line graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Real-Time/

### Record

VM Network Status (PI\_VNI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Net ID	Network ID
Rate	Speed at which the physical server sends data to or receives data from the network (KB/sec)
Recv Rate	Speed at which the physical server receives data from the network (KB/sec)
Send Rate	Speed at which the physical server sends data to the network (KB/sec)

## VM Swap Used (Troubleshooting/Real-Time)

---

### Overview

The VM Swap Used report displays the swap usage of a virtual machine on a real-time basis, in list and stacked bar graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Real-Time/

### Record

VM Memory Status (PI\_VMI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Resource Used	Memory resources used (MB)
Resource Used %	Memory resource usage (%)
VM Swap Used	Internal swap used (MB)
VM Swap Used %	Internal swap usage (%)
Host Swap Used	External swap used (MB)
Host Swap Used %	External swap usage (%)
Unused	Memory unused (MB)

## VM Swap Used (Troubleshooting/Recent Past)

---

### Overview

The VM Swap Used report displays the swap usage of a virtual machine over the past hour in minute-by-minute summaries, in table and stacked bar graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Recent Past/

### Record

VM Memory Status (PI\_VMI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Resource Used	Memory resources used (MB)
Resource Used %	Memory resource usage (%)
VM Swap Used	Internal swap used (MB)
VM Swap Used %	Internal swap usage (%)
Host Swap Used	External swap used (MB)
Host Swap Used %	External swap usage (%)
Unused	Memory unused (MB)

## VM Working Size - Total (Troubleshooting/Real-Time)

---

### Overview

The `VM Working Size - Total` report displays the working set size of all virtual machines on a real-time basis, in list and stacked area graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Real-Time/

### Record

VM Memory Status (PI\_VMI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Working Size	Working set size (MB)
Working Size %	Working set size rate (%)

## VM Working Size - Total (Troubleshooting/Recent Past)

---

### Overview

The `VM Working Size - Total` report displays the working set size of all virtual machines over the past hour in minute-by-minute summaries, in table and stacked area graph formats.

### Storage location

Reports/RM VirtualMachine/Troubleshooting/Recent Past/

### Record

VM Memory Status (PI\_VMI)

### Fields

Field name	Explanation
Sampling Time	Performance information collection time on the monitored host
VM Name	Virtual machine name
Working Size	Working set size (MB)
Working Size %	Working set size rate (%)

# 5

## Records

This chapter explains the records used in PFM - RM for Virtual Machine. For details about how to collect performance data for each record, see the chapter that explains Performance Management functions in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*, or see the chapter that explains management of operation monitoring data in the *Job Management Partner 1/Performance Management User's Guide*.



## Data model

---

The records and fields that each PFM - RM for Virtual Machine has are collectively called *data models*. The data models that these PFM - RM for Virtual Machine has are individually assigned unique version numbers. For details about the relationship between versions of PFM - RM for Virtual Machine and data model versions, see [H. \*Version Compatibility\*](#).

To view the data model version of each PFM - RM for Virtual Machine, display the properties of the agent from the Agents window of PFM - Web Console.

For details about data models, see the chapter that explains Performance Management functions in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

## Format of record explanations

This chapter lists in alphabetical order the records used in PFM - RM for Virtual Machine. The explanation of each record consists of the following items.

### Function

Provides an overview of the performance data stored in each record, and notes related to it.

### Default values and values that can be changed

This item shows the default values of the performance data collection conditions that are set in each record and the values that can be changed by the user, in table format. The table below shows the items that are described as default values, the values that can be changed, and their meanings. For details about each item shown in this table, see the chapter that explains management of operation monitoring data in the *Job Management Partner 1/Performance Management User's Guide*.

Table 5–1: Default values and values that can be changed

Item	Meaning	Changeability
Collection interval	Performance data collection interval (seconds)	Y: Can be changed. N: Cannot be changed.
Collection Offset <sup>#</sup>	Offset for starting performance data collection (seconds). For details about offsets, see the chapter that explains management of operation monitoring data in the <i>Job Management Partner 1/Performance Management User's Guide</i> .  For details about the performance data collection start time, see the chapter that explains Performance Management functions in the <i>Job Management Partner 1/Performance Management Planning and Configuration Guide</i> .	
Log	Whether to record the collected performance data in the Store database  Yes: Records the performance data. However, performance data will not be recorded if Collection Interval=0.  No: Does not record the performance data.	
LOGIF	Condition for determining whether to record the collected performance data in the Store database	

#

A value between 0 and 32,767 seconds (within the value specified in Collection Interval) can be specified. When multiple data items are being collected, the system load will increase if they are all collected at the same time. Therefore, a collection offset is used to distribute the collection load. Note that the data collection recording time is the same as that specified in Collection Interval regardless of the value specified in Collection Offset. When you change the Collection Offset value, specify a value by taking the collection load into consideration.

### ODBC key field

To use an SQL from PFM - Manager to utilize the data of a record stored in the Store database, you need an ODBC key field. Some ODBC key fields are common to all records, while others are unique to each record. ODBC key fields unique to individual records are listed under this heading in each record description. Only multi-instance records have unique ODBC key fields.

For the ODBC key fields common to all records, see [List of ODBC key fields](#) in this chapter. For details about how to use an ODBC key field, see the chapter that explains linkage to ODBC-compatible application programs in the *Job Management Partner 1/Performance Management User's Guide*.

## Lifetime

Lifetime indicates a period during which the integrity of the performance data collected in each record is guaranteed. For details about lifetime, see the chapter that explains Performance Management functions in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

## Record size

Record size indicates the size of the performance data that is stored in each record during a single collection operation.

## Fields

The fields of each record are listed in a table. The various items in the table are explained below.

- PFM - View name (PFM - Manager name)
  - PFM - View name  
Indicates the field name (PFM - View name) displayed on PFM - Web Console.
  - PFM - Manager name  
Indicates the field name (PFM - Manager name) to be described in an SQL when you want to use the SQL from PFM - Manager to utilize the data of the field stored in the Store database.  
In the SQL statement, the field name is described in a format that has the record ID of each record at the beginning. For example, in the case of the VM Count (VM\_COUNT) field of the Host Status Detail (PD) record, describe the field name as PD\_VM\_COUNT.

- Explanation

Explains the performance data that is stored in each field.

You can obtain the performance data of each field in any of the following ways:

- Obtain the average or a percentage from the most recently collected data and the data collected during the previous interval
- Obtain performance data only from the most recently collected data
- Obtain data from other fields

Unless otherwise specified, the value obtained from a data collection interval is used.

In a historical report, the following types of values can be displayed when records of the PI record type are summarized by specifying a value other than minutes as the reporting interval:

- The average value for the summary interval
- The last collected value
- The total value
- The minimum value
- The maximum value

Unless otherwise specified, the average value for the summary interval is displayed for the field value.

- Summary rules

Indicates the summary method (rule) used by Remote Monitor Store to summarize data. For details about summary rules, see [Summary rules](#) in this chapter.

- Grouping rules

*Grouping rules* refers to a method that is used to consolidate the performance information of remote agents that belong to the same instance. For details about grouping rules, see [Grouping rules](#) in this chapter.

- Format

Indicates the data type, such as `double`, of the value in each field. For details about data types, see [List of data types](#) in this chapter.

- Delta

When data is collected as a cumulative value, a *delta* value is used to display the data as the changed amount. For details about delta values, see [Field values](#) in this chapter.

- When not collected

Indicates the value that is stored in the field when performance data collection failed.

- No: Indicates the case in which no data for the entire record can be collected when performance data collection fails.
- --: Indicates a field in which data can always be collected.

- Unsupported

Indicates a virtual environment that does not support the field.

- --: Indicates that the field is supported by all virtual environments supported by PFM - RM for Virtual Machine.

## List of ODBC key fields

Some ODBC key fields are common to all records, while others are specific to individual records. This section presents the ODBC key fields common to all records. With PFM - Manager, ODBC key fields are required in order for you to use SQL statements to access record data stored in the Store database.

The table below lists the ODBC key fields that are common to all records. For details about the ODBC key fields that are specific to each record, see the individual record descriptions.

Table 5–2: List of ODBC key fields common to all records

ODBC key field	ODBC format	Data	Explanation
<i>record-ID</i> _DATE	SQL_INTEGER	Internal	Record key indicating the date when the record was generated
<i>record-ID</i> _DATETIME	SQL_INTEGER	Internal	Combination of record ID_DATE field and record ID_TIME field
<i>record-ID</i> _DEVICEID	SQL_VARCHAR	Internal	Instance name [host name]
<i>record-ID</i> _DRAWER_TYPE	SQL_VARCHAR	Internal	Category. The values are valid: m: Minute H: Hour D: Day W: Week M: Month Y: Year
<i>record-ID</i> _PROD_INST	SQL_VARCHAR	Internal	PFM - RM for Virtual Machine instance name
<i>record-ID</i> _PRODID	SQL_VARCHAR	Internal	PFM - RM for Virtual Machine product ID
<i>record-ID</i> _RECORD_TYPE	SQL_VARCHAR	Internal	ID indicating a record type (4 bytes)
<i>record-ID</i> _TIME	SQL_INTEGER	Internal	Time at which the record was generated (Greenwich Mean Time)

## Summary rules

For records of the `PI` record type, two types of data are stored in the Store database: The data collected at the interval set in Collection Interval, and the data summarized for a specific period of time (minute, hour, day, week, month, or year) according to a predefined rule. The type of summarization is defined for each field. This definition is called a *summarization rule*.

Depending on the summarization rule, intermediate data in the summarization period must be retained. In this case, a field for holding the intermediate data is added to a record in the Store database. This field is called an *added field*.

Part of an added field is displayed as a record field in PFM - Web Console. The added fields displayed on PFM - Web Console can be used as the fields to be displayed in a historical report.

The fields referred to in the record descriptions in this chapter are known as *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  
PFM - Manager name of the record-specific field, plus a suffix
- Additional field displayed in PFM - Web Console  
PFM - View name of the record-specific field, plus a suffix

The following table shows the suffix added to the PFM - Manager name, the suffix added to the corresponding PFM - View name, and the data stored in that field.

Table 5–3: List of suffixes in additional field names

Suffix added to the PFM - Manager name	Suffix added to the PFM - View name	Field data
<code>_TOTAL</code>	(Total)	Sum of the field values in all records in the summary period
<code>_COUNT</code>	--	Number of records collected in the summary period
<code>_HI</code>	(Max)	Highest field value in the records in the summary period
<code>_LO</code>	(Min)	Lowest field value in the records in the summary period

Legend:

--: No additional field.

The table below lists the summary rules.

Table 5–4: List of summary rules

Summary rule name	Summary rules
<code>COPY</code>	Stores the actual field value of the most recent record in the summary period.
<code>AVG</code>	<div>Stores the average field value of all field values in the summary period. The average value is calculated using the following expression:<div><math display="block">(sum-of-field-values) / (number-of-records-collected)</math></div> Additional field (Store database)<ul style="list-style-type: none"><li>• <code>_TOTAL</code></li></ul></div>

Summary rule name	Summary rules
AVG	<ul style="list-style-type: none"> <li>• <code>_COUNT</code></li> </ul> <p>Additional field (PFM - Web Console)</p> <ul style="list-style-type: none"> <li>• <code>(Total)</code></li> </ul>
HILO	<p>Stores the highest value, lowest value, and average value of all field values in the summary period. A record-specific field stores the average value. The highest value, lowest value, and average value is calculated using the following expression:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <math display="block">(sum-of-field-values) / (number-of-records-collected)</math> </div> <p>Additional field (Store database)</p> <ul style="list-style-type: none"> <li>• <code>_HI</code></li> <li>• <code>_LO</code></li> <li>• <code>_TOTAL</code></li> <li>• <code>_COUNT</code></li> </ul> <p>Additional field (PFM - Web Console)</p> <ul style="list-style-type: none"> <li>• <code>(Max)</code></li> <li>• <code>(Min)</code></li> <li>• <code>(Total)</code></li> </ul>
--	No summarization

## Grouping rules

---

The performance data of managed hosts in the same instance environment is consolidated as group agent data based on predefined rules. These rules are called *grouping rules*.

The following table lists the grouping rules.

**Table 5–5:** List of grouping rules

Grouping rule name	Grouping rules
ADD	Stores the sum of the performance data values for all monitored hosts in the same instance environment.
AVG	Stores the average of the performance data values for all monitored hosts in the same instance environment.
COPY	Stores the value of specific performance data for monitored hosts in the same instance environment.
FIXED	Stores a fixed value independently of performance data.



## List of data types

The table below lists the data type for each field value and the corresponding C and C++ data types. The *Field* value under *Data type* shown in this table is indicated under the *Format* column in the Field table for each record.

Table 5–6: Data type list

Data type		Size (bytes)	Explanation
Field	C and C++		
<code>char(<i>n</i>)</code>	<code>char ( )</code>	1	Character data (0x20-0x7e)
<code>double</code>	<code>double</code>	8	Numeric value (1 . 7E ± 308 (15 digits))
<code>long</code>	<code>long</code>	4	Numeric value (-2,147,483,648 through 2,147,483,647)
<code>short</code>	<code>short</code>	2	Numeric value (-32,768 through 32,767)
<code>string(<i>n</i>)</code>	<code>char[ ]</code>	Number inside ( )	Character string that is <i>n</i> -byte long. The last characters are NULL.
<code>time_t</code>	<code>unsigned long</code>	4	Numeric value (0 through 4,294,967,295)
<code>timeval</code>	<code>structure</code>	8	Numeric value (The first 4 bytes and the next 4 bytes indicate seconds and microseconds, respectively.)
<code>ulong</code>	<code>unsigned long</code>	4	Numeric value (0 through 4,294,967,295)
<code>ushort</code>	<code>unsigned short</code>	2	Numeric value (0 through 65,535)
<code>utime</code>	<code>structure</code>	8	Numeric value (The first 4 bytes and the next 4 bytes indicate seconds and microseconds, respectively.)
<code>word</code>	<code>unsigned short</code>	2	Numeric value (0 through 65,535)
(Not applicable)	<code>unsigned char</code>	1	Numeric value (0 through 255)

## Field values

This section explains the values stored in each field.

### Delta

When data is collected as a cumulative value, *delta* is used to display the data as the amount by which the data has changed. For example, if the first performance data item collected is 3 and the second performance data item collected is 4, the cumulative value of 7 and a changed amount of 1 are stored. Whether the value in each field is a delta value is indicated in the *Delta* column of the Field table. Performance data collected by PFM - RM for Virtual Machine varies as shown in the table below.

Note that the delta value can be a negative value since it is a relative value that depends on the last data item.

Table 5–7: Performance data collected by PFM - RM for Virtual Machine

Record type	Delta	Type of data	Indicate delta value <sup>#</sup>	Record value
PI record type	Yes	Real-time data	Selected	Displays the changed amount.
			Not selected	Displays the changed amount.
		<ul style="list-style-type: none"><li>Historical data</li><li>Alarm monitoring data</li></ul>	--	Displays the changed amount.
	No	Real-time data	Selected	Displays the value that was valid at the time of collection.
			Not selected	Displays the value that was valid at the time of collection.
		<ul style="list-style-type: none"><li>Historical data</li><li>Alarm monitoring data</li></ul>	--	Displays the value that was valid at the time of collection.
PD record type	Yes	Real-time data	Selected	Displays the changed amount.
			Not selected	Displays the cumulative value.
		<ul style="list-style-type: none"><li>Historical data</li><li>Alarm monitoring data</li></ul>	--	Displays the cumulative value.
	No	Real-time data	Selected	Displays the value that was valid at the time of collection.
			Not selected	Displays the value that was valid at the time of collection.
		<ul style="list-style-type: none"><li>Historical data</li><li>Alarm monitoring data</li></ul>	--	Displays the value that was valid at the time of collection.

Legend:

--: Not applicable

#

Selected means that the following GUI item is selected in the dialog box of PFM - Web Console:

- **Indicate delta value** in the report wizard's Edit > Indication Settings(Realtime) window
- **Indicate delta value** in **Indication Settings(Realtime)** on the **Properties** page in the report window

Note the following when performance data is being collected:

- Before records of the PI record type can be saved, performance data must be collected at least twice.

Records of the PI record type collect performance data for each collection interval that was set in PFM - Web Console. However, performance data is not stored in the Store database at the time performance data collection is set in PFM - Web Console.

Since historical data of the PI record type contains data that requires the difference from the previously collected data (delta value), data from two collection intervals is required. Consequently, it takes a maximum of twice the set time before historical data is stored in the Store database.

For example, if the performance data collection interval is set to 300 seconds (5 minutes) at 18:32 on PFM - Web Console, the first data collection starts at 18:35 and the next data collection starts at 18:40. Historical data is created based on the data collected at 18:35 and 18:40, and is stored in the Store database at 18:40 (8 minutes after the setting time of 18:32).

- A real-time report displays a value immediately when the first data is collected.  
However, if a report requires previous data, 0 is displayed as the first value. The second and subsequent data collection operations differ depending on the report.
- In the following cases, after the second data collection, the value in effect at the time of data collection is displayed:
  - **Indicate delta value** is not selected in the real-time report setting for the PI record type.
  - **Indicate delta value** is selected in the real-time report setting for the PD record type.
- In the following case, after the second data collection, the difference between the first and second data is displayed. After the third data collection, however, the value in effect at the time of data collection is displayed:
  - **Indicate delta value** is selected in the real-time report setting for the PI record type.
- If the monitored channel is rebooted while PFM - RM for Virtual Machine is starting, the collected data value may show a negative value. However, a value of 0 or greater will be displayed as the data difference for the second and subsequent data collections.

## Fields that are added only when a record is recorded in the Store database

The table below shows the fields that are added only when data is being recorded in the Store database.

Table 5–8: Fields that are added only when data is being recorded in the Store database

PFM - View name (PFM - Manager name)	Explanation	Format	Delta	Supported version	Data source
Agent Host (DEVICEID)	Name of the host on which PFM - RM for Virtual Machine is running	string (256)	No	All	--
Agent Instance (PROD_INST)	PFM - RM for Virtual Machine instance name	string (256)	No	All	--
Agent Type (PROID)	PFM - RM for Virtual Machine product ID, expressed as a 1-byte ID	char	No	All	--
Date (DATE)	Date on which the record was created. Greenwich Mean Time <sup>#1, #2</sup>	char (3)	No	All	--
Date and Time (DATETIME)	Combination of Date (DATE) field and Time (TIME) field <sup>#2</sup>	char (6)	No	All	--
Drawer Type (DRAWER_TYPE)	For a record of the PI record type, this is the category in which data is summarized. The category display differs depending on whether the record is displayed as a report on PFM - Web Console, or whether it is displayed using an ODBC driver. <sup>#3</sup>	char	No	All	--
GMT Offset (GMT_ADJUST)	Difference between Greenwich Mean Time and the local time, in seconds	long	No	All	--
Time (TIME)	Time at which the record was created. Greenwich Mean Time <sup>#1, #2</sup>	char (3)	No	All	--

Legend:

--: The field stores the raw (not altered) value of performance data acquired from the monitoring-target environment.

#1

Since a record of the PI record type summarizes data, the time used as the basis for summarizing data is specified. The following table indicates the setting for each record category.

Table 5–9: Setting for each record category

Category	Setting for each record category
Minute	The 0 <sup>th</sup> second of the time at which the record was created
Hour	The 0 <sup>th</sup> minute and 0 <sup>th</sup> second of the time at which the record was created
Day	The 0 <sup>th</sup> hour, 0 <sup>th</sup> minute, and 0 <sup>th</sup> second of the time at which the record was created
Week	The 0 <sup>th</sup> hour, 0 <sup>th</sup> minute, and 0 <sup>th</sup> second of the Monday of the week in which the record was created

Category	Setting for each record category
Month	The 0 <sup>th</sup> hour, 0 <sup>th</sup> minute, and 0 <sup>th</sup> second of the first day of the month in which the record was created
Year	The 0 <sup>th</sup> hour, 0 <sup>th</sup> minute, and 0 <sup>th</sup> second of January 1st of the year in which the record was created

#2

When data is displayed in a report or by the ODBC driver, the Date field is displayed in the *YYYYMMDD* format, the Date and Time field is displayed in the *YYYYMMDD hh:mm:ss* format, and the Time field is displayed in the *hh:mm:ss* format.

#3

The table below shows the difference in data summary category between a report displayed on PFM - Web Console and data displayed using the ODBC driver.

**Table 5–10: Difference in data summary category depending on the display method**

Category	PFM - Web Console	ODBC driver
Minute	Minute	m
Hour	Hour	H
Day	Day	D
Week	Week	W
Month	Month	M
Year	Year	Y

## Notes on records

---

When you collect records, note the following.

### Precautions for collecting performance data

The following provides precautions for collecting performance data.

#### About the registry

This note applies to only Hyper-V.

Operation of PFM - RM for Virtual Machine is only supported in an OS environment using the standard settings.

Performance data might not be collected correctly if special OS settings are specified in some way, such as using the registry editor to edit the registry directly. This is also true if the special settings have been published in the Microsoft Knowledge Base.

#### About collection of log data

PFM - RM for Virtual Machine stores log data for all monitoring targets or log data consolidated on a group agent basis in data files. A data file is created for each record. The maximum size of each data file is 2 GB. Therefore, if many hosts are monitored by a PFM - RM for Virtual Machine instance or if many instances are generated for a record, the Store database might be unable to store all of the log data.

In particular, log data consolidated by a group agent is likely to put pressure on the data file size. Therefore, if you use a group agent to perform monitoring, you must reduce the number of hosts monitored by the instance. Alternatively, you must use the `LOGIF` property to filter data that can be stored in the Store database.

For details about how to estimate the disk space requirements for the Store database, see [A. Estimating System Requirements](#).

### Notes on changing the system resources of a monitored host

The following provides notes on changing the system resources of a monitored host.

#### About performance data before and after system resources are changed

If the system resources of a monitored host are changed, continuity between data before the change and data after the change will be lost. Therefore, performance data before the system resources are changed and performance data after the system resources are changed must be handled separately.

### Record generation result when data cannot be collected

The following explains the record generation result when data stored in a field cannot be collected.

#### Record is not generated

No record is generated in the following case:

- When PFM - RM for Virtual Machine cannot collect the performance data stored in a field defined as an ODBC key field

## Note about virtual machine name for Hyper-V

- If there are multiple virtual machines with the same name in the same Hyper-V system, PFM - RM for Virtual Machine might not be able to collect the correct information. Make sure that each virtual machine has a unique name.

## Notes on collecting KVM and Hyper-V records

For records of the PI record type, there are fields that require performance data to be collected at least twice.

### Causes of the value of a field becoming 0

The value of a field becomes 0 in the following cases:

- The field requires performance data to be collected at least twice, but performance data has been collected only once.
- The field requires performance data to be collected at least twice, but performance data collection order is not chronologically correct.

## List of records

The following table shows the records that can be collected by PFM - RM for Virtual Machine, and the information stored in these records.

Table 5–11: PFM - RM for Virtual Machine record list

Record name	Record ID	Information stored
<i>Host CPU Status</i>	<i>PI_HCI</i>	Performance data on a physical server's physical CPU over a unit of time
<i>Host Logical Disk Status</i>	<i>PI_HLDI</i>	Performance data on a physical server's logical disk over a unit of time
<i>Host Memory Status</i>	<i>PI_HMI</i>	Performance data on a physical server's physical memory over a unit of time
<i>Host Network Status</i>	<i>PI_HNI</i>	Performance data on a physical server's physical NIC over a unit of time
<i>Host Physical Disk Status</i>	<i>PI_HPDI</i>	Performance data on a physical server's physical disk over a unit of time
<i>Host Status Detail</i>	<i>PD</i>	Performance data that indicates the status of a physical server at a given point in time
<i>Host Status</i>	<i>PI</i>	Performance data on a physical server over a unit of time
<i>VM CPU Status</i>	<i>PI_VCI</i>	Performance data on a virtual CPU being used by a virtual machine over a unit of time
<i>VM Logical Disk Status</i>	<i>PI_VLDI</i>	Performance data on a logical disk being used by a virtual machine over a unit of time
<i>VM Memory Status</i>	<i>PI_VMI</i>	Performance data on virtual memory being used by a virtual machine over a unit of time
<i>VM Network Status</i>	<i>PI_VNI</i>	Performance data on a virtual NIC being used by a virtual machine over a unit of time
<i>VM Physical Disk Status</i>	<i>PI_VPDI</i>	Performance data on a physical disk being used by a virtual machine over a unit of time
<i>VM Status Detail</i>	<i>PD_VM</i>	Performance data that indicates the status of a virtual machine at a given point in time
<i>VM Status</i>	<i>PI_VI</i>	Performance data on a virtual machine over a unit of time



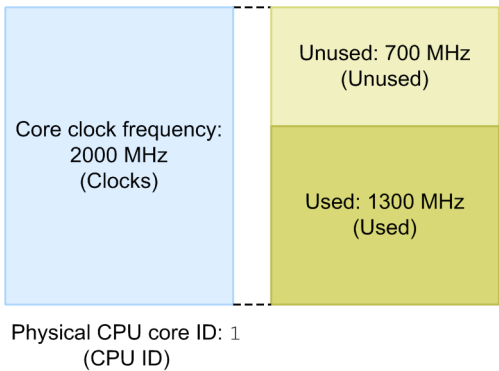
# Host CPU Status (PI\_HCI)

## Function

This record stores performance data on a physical server's physical CPU over a unit of time. This record is a multi-instance record.

In this record, you can collect performance data such as CPU usage for each CPU core. The CPU frequency can be divided into the part of the CPU that is being used and the part of the CPU that is not being used. The following figure shows an example of data that can be collected in this record.

Figure 5–1: Example of collected data



*Note:*

Information cannot be collected if an attempt to connect to the monitored physical server fails.

## Default values and values that can be changed

Item	Default value	Can it be changed?
Collection Interval	300	Yes
Collection Offset	0	Yes
Log	No	Yes
LOGIF	Blank	Yes

## ODBC key field

PI\_HCI\_CPU\_ID

## Lifetime

None

## Record size

- Fixed portion: 937 bytes
- Variable portion: 473 bytes

## Fields

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Record Type (INPUT_RECORD_TYPE)	The record name. This is always "HCI".	COPY	COPY	char (8)	No	--	--
Record Time (RECORD_TIME)	The time when the record was created.	COPY	COPY	time_t	No	--	--
Interval (INTERVAL)	Interval during which the information is collected. [Units: seconds]	COPY	FIXED	ulong	No	--	--
VA DeviceID (VADEVICEID)	The device ID of a monitored host.	COPY	COPY	string(256)	No	--	--
CPU ID (CPU_ID)	ID of the physical CPU.	COPY	FIXED	string (32)	No	No	--
CPU Name (CPU_NAME)	Name of the physical CPU.	COPY	FIXED	string (257)	No	Blank	--
Sampling Time (SAMPLING_TIME)	Sampling time. The time when the performance information is collected on the host machine. Displayed in the following format: <i>yyyy-mm-ddThh:mm [ ± hh:mm ] #1</i>	COPY	FIXED	string (32)	No	Blank	--
Clocks (CLOCKS)	Clock frequency of the physical CPU. [Units: MHz]	COPY	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Used (USED) <sup>#2</sup>	Amount of used physical CPUs. The frequency used by the physical CPUs. [Units: MHz]	HILO	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Unused (UNUSED)	Amount of unused physical CPUs. Unused frequency of the physical CPU. [Units: MHz]	HILO	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Used % (USED_PERCENT) <sup>#2</sup>	Usage rate of physical CPUs. Percentage of physical CPUs that are being used. [Units: %] Expression: "Used" field / "Clocks" field	HILO	AVG	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Unused % (UNUSED_PERCENT)	Non-usage rate of physical CPUs. Percentage of physical CPUs that are not being used. [Units: %]	HILO	AVG	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Unused % (UNUSED_PERCENT)	Expression: "Unused" field / "Clocks" field	HILO	AVG	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--

#1

The value used in [  $\pm hh:mm$  ] varies depending on the time zone of the monitored host. For example, if the monitored virtual environment is operating according to JST, +09:00 is displayed. If the monitored virtual environment is operating according to UTC, Z is displayed.

#2

For Hyper-V or KVM, this field requires performance data to be collected at least twice.

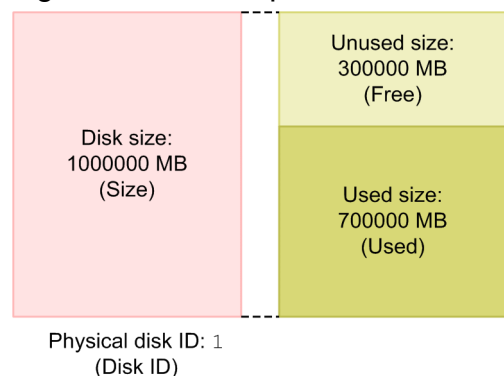
# Host Logical Disk Status (PI\_HLDI)

## Function

This record stores performance data on a physical server's logical disk over a unit of time. This record is a multi-instance record.

In this record you can collect performance data, such as how much of a logical disk on a physical server is used. The disk space can be divided into used space and unused space. The figure below shows an example of data that can be collected in this record.

Figure 5–2: Example of collected data



### Notes:

- Information cannot be collected if an attempt to connect to the monitored physical server fails.
- Returns the data store information.
- For Hyper-V, the record is created and performance data can be collected only if the disk is local disk.
- If the monitoring target uses VMware, the value of the `PI_HLDI` field is updated only when VMware ESX is managed with vCenter. For details, see *Note* in [1.4.5\(1\) Overview](#).

## Default values and values that can be changed

Item	Default value	Can it be changed?
Collection Interval	300	Yes
Collection Offset	0	Yes
Log	No	Yes
LOGIF	Blank	Yes

## ODBC key field

`PI_HLDI_DISK_ID`

## Lifetime

None

## Record size

- Fixed portion: 937 bytes

- Variable portion: 433 bytes

## Fields

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Record Type (INPUT_RECORD_TYPE)	The record name. This is always HLDI.	COPY	COPY	char (8)	No	--	--
Record Time (RECORD_TIME)	The time when the record was created.	COPY	COPY	time_t	No	--	--
Interval (INTERVAL)	Interval during which the information is collected. [Units: seconds]	COPY	FIXED	ulong	No	--	--
VA DeviceID (VADEVICEID)	The device ID of a monitored host.	COPY	COPY	string(256)	No	--	--
Disk ID (DISK_ID)	Disk ID.	COPY	FIXED	string (257)	No	No	--
Sampling Time (SAMPLING_TIME)	Sampling time. The time when the performance information is collected on the host machine. Displayed in the following format: <i>yyyy-mm-ddThh:mm [ ± hh:mm ] #</i>	COPY	FIXED	string (32)	No	0	--
Size (SIZE)	Disk size. [Units: MB]	HILO	ADD	double	No	0	--
Used (USED)	Size of used space. [Units: MB]	HILO	ADD	double	No	0	--
Free (FREE)	Size of free space. [Units: MB]	HILO	ADD	double	No	0	--
Used % (USED_PERCENT)	Usage rate. [Units: %] Expression: "Used" field / "Size" field	HILO	AVG	double	No	0	--

#

The value used in [ ± hh:mm ] varies depending on the time zone of the monitored host. For example, if the monitored virtual environment is operating according to JST, +09:00 is displayed. If the monitored virtual environment is operating according to UTC, Z is displayed.

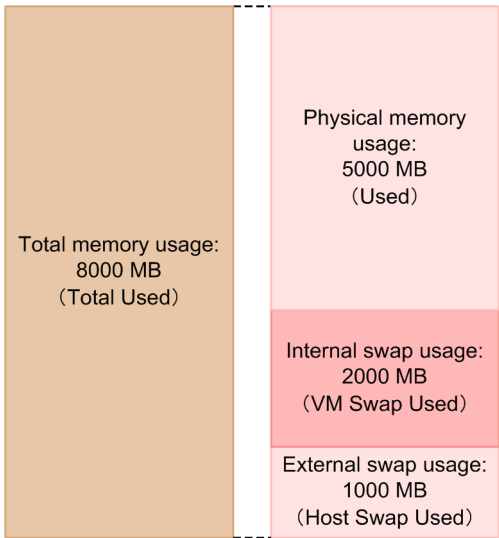
# Host Memory Status (PI\_HMI)

## Function

This record stores performance data on a physical server's physical memory over a unit of time. This record is a single-instance record.

In this record, you can view performance data such as physical memory usage details, usage details by VMM, and swap usage. The figure below shows an example of data that can be collected in this record.

Figure 5–3: Example of collected data



*Note:*

Information cannot be collected if an attempt to connect to the monitored physical server fails.

## Default values and values that can be changed

Item	Default value	Can it be changed?
Collection Interval	300	Yes
Collection Offset	0	Yes
Log	No	Yes
LOGIF	Blank	Yes

## ODBC key field

None

## Lifetime

None

## Record size

- Fixed portion: 1,553 bytes
- Variable portion: 0 bytes

## Fields

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Record Type (INPUT_RECORD_TYPE)	The record name. This is always HMI.	COPY	COPY	char (8)	No	--	--
Record Time (RECORD_TIME)	The time when the record was created.	COPY	COPY	time_t	No	--	--
Interval (INTERVAL)	Interval during which the information is collected. [Units: seconds]	COPY	FIXED	ulong	No	--	--
VA DeviceID (VADEVICEID)	The device ID of a monitored host.	COPY	COPY	string(256)	No	--	--
Size (SIZE)	Memory resource size. Total size of the physical memory on the host. [Units: MB]	COPY	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Sampling Time (SAMPLING_TIME)	Sampling time. The time when the performance information is collected on the host machine. Displayed in the following format: <i>yyyy-mm-ddThh:mm [ ± hh:mm ] #</i>	COPY	FIXED	string (32)	No	Blank	--
Used (USED)	Amount of used memory resources. <ul style="list-style-type: none"> <li>For VMware, Hyper-V and KVM</li> </ul> Amount of memory resources used on the physical server. [Units: MB]	HILO	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
VMM Used (VMM_USED)	Amount of memory resources used by the VMM. <ul style="list-style-type: none"> <li>For VMware and KVM</li> </ul> Amount of memory resources used by VMM. [Units: MB]	HILO	ADD	double	No	VMware: 0 KVM: 0	Hyper-V
VM Used (VM_USED)	Amount of memory resources used by the VM. <ul style="list-style-type: none"> <li>For VMware and KVM</li> </ul> Amount of memory resources used by the virtual machine. [Units: MB]	HILO	ADD	double	No	VMware: 0 KVM: 0	Hyper-V
Unused (UNUSED)	Amount of unused memory resources.	HILO	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Unused (UNUSED)	Memory resources unused by the host. [Units: MB]	HILO	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
VM Swap Used (VM_SWAP_USED)	Amount of internal swap areas usage. Amount of the internal swap area used in the virtual machines. [Units: MB]	HILO	ADD	double	No	0	Hyper-V
Host Swap Used (HOST_SWAP_USED)	Amount of external swap area usage. Total amount of the external swap area used in all virtual machines. [Units: MB]	HILO	ADD	double	No	0	Hyper-V
Total Used (TOTAL_USED)	Total amount of used memory. • For VMware, Hyper-V and KVM Total amount of memory resources used by the physical server added to the amount of used internal and external swap areas. [Units: MB]	HILO	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Used % (USED_PERCENT)	Usage rate of memory resources. • For VMware, Hyper-V and KVM Percentage of memory resources used at the physical server. [Units: %] Expression: "Used" field / "Size" field	HILO	AVG	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
VMM Used % (VMM_USED_PERCENT)	Usage rate of memory resources by the VMM. • For VMware and KVM Percentage of memory resources used by the virtual machine monitor. [Units: %] Expression: "VMM Used" field / "Size" field	HILO	AVG	double	No	VMware: 0 KVM: 0	Hyper-V
VM Used % (VM_USED_PERCENT)	Usage rate of memory resources by the VM. • For VMware and KVM Percentage of memory resources used by the virtual machine. [Units: %] Expression: "VM Used" field / "Size" field	HILO	AVG	double	No	VMware: 0 KVM: 0	Hyper-V



PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
VM Swap Used % (VM_SWAP_USED_PERCENT)	Usage rate of internal swap area. Percentage of the internal swap area, of all virtual machines, that is used. [Units: %] Expression: "VM Swap Used" field / "Size" field	HILO	AVG	double	No	0	Hyper-V
Host Swap Used % (HOST_SWAP_USED_PERCENT)	Usage rate of external swap area. Percentage of the external swap areas, of all virtual machines, that is used. [Units: %] Expression: "Host Swap Used" field / "Size" field	HILO	AVG	double	No	0	Hyper-V
Total Used % (TOTAL_USED_PERCENT)	Usage rate of all memory resources. <ul style="list-style-type: none"> <li>For VMware, Hyper-V and KVM</li> </ul> Percentage of total memory resources used, including memory resources used by the physical server and the amount of internal and external swap areas that were used. [Units: %] "Total Used" field / "Size" field	HILO	AVG	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Swap IO (SWAP_IO)	Host swap I/O. Amount of operations, for swap resources, that were generated by the host machine. [Units: MB]	HILO	ADD	double	No	0	Hyper-V
Swap In IO (SWAP_IN_IO)	Host swap-in I/O. Amount of swap-in operations, for swap resources, that were generated by the host machine. [Units: MB]	HILO	ADD	double	No	0	Hyper-V
Swap Out IO (SWAP_OUT_IO)	Host swap-out I/O. Amount of swap-out operations, for swap resources, that were generated by the host machine. [Units: MB]	HILO	ADD	double	No	0	Hyper-V

#

The value used in [  $\pm hh:mm$  ] varies depending on the time zone of the monitored host. For example, if the monitored virtual environment is operating according to JST, +09:00 is displayed. If the monitored virtual environment is operating according to UTC, Z is displayed.

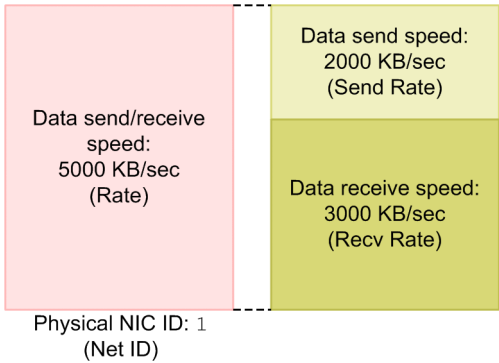
# Host Network Status (PI\_HNI)

## Function

This record stores performance data on a physical server's physical NIC over a unit of time. This record is a multi-instance record.

In this record, you can collect performance data such as data send/receive speed. The data send/receive speed can be divided into data receive speed and data send speed. The figure below shows an example of data that can be collected in this record.

Figure 5–4: Example of collected data



- Note:*
- Information cannot be collected if an attempt to connect to the monitored physical server fails.
  - For Hyper-V, specific symbols included in a network identifier are converted to other symbols when the network identifier is stored in the `Net ID` field. The conversion rules are as follows:

Before conversion	After conversion
/ and \	-
# and *	_
(	[
)	]

## Default values and values that can be changed

Item	Default value	Can it be changed?
Collection Interval	300	Yes
Collection Offset	0	Yes
Log	No	Yes
LOGIF	Blank	Yes

## ODBC key field

PI\_HNI\_NET\_ID

## Lifetime

None

## Record size

- Fixed portion: 937 bytes
- Variable portion: 397 bytes

## Fields

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Record Type (INPUT_RECORD_TYPE)	The record name. This is always HNI.	COPY	COPY	char (8)	No	--	--
Record Time (RECORD_TIME)	The time when the record was created.	COPY	COPY	time_t	No	--	--
Interval (INTERVAL)	Interval during which the information is collected. [Units: seconds]	COPY	FIXED	ulong	No	--	--
VA DeviceID (VADEVICEID)	The device ID of a monitored host.	COPY	COPY	string(256)	No	--	--
Net ID (NET_ID)	Network ID.	COPY	FIXED	string (257)	No	No	--
Sampling Time (SAMPLING_TIME)	Sampling time. The time when the performance information is collected on the host machine. Displayed in the following format: <i>yyyy-mm-ddThh:mm [ ± hh:mm ]</i> <sup>#1</sup>	COPY	FIXED	string (32)	No	Blank	--
Rate (RATE) <sup>#2</sup>	Speed of transmission to and from the network by the host machine. [Units: KBps]	HILO	AVG	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Send Rate (SEND_RATE) <sup>#2</sup>	Speed of sending to the network by the host machine. [Units: KBps]	HILO	AVG	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Recv Rate (RECV_RATE) <sup>#2</sup>	Speed of receiving from the network by the host machine. [Units: KBps]	HILO	AVG	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--

#1

The value used in [ ± hh:mm ] varies depending on the time zone of the monitored host. For example, if the monitored virtual environment is operating according to JST, +09:00 is displayed. If the monitored virtual environment is operating according to UTC, Z is displayed.

#2

For Hyper-V or KVM, this field requires performance data to be collected at least twice.

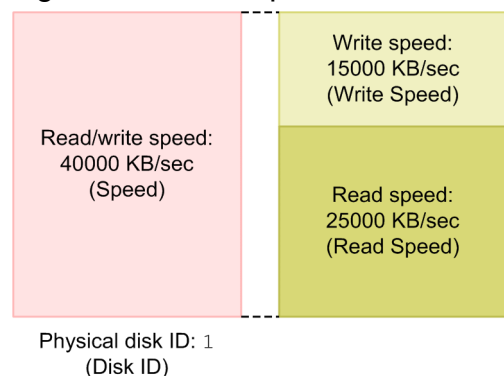
# Host Physical Disk Status (PI\_HPDI)

## Function

This record stores performance data on a physical disk of a physical server over a unit of time. This record is a multi-instance record.

In this record, you can collect performance data such as data read/write speed on a physical disk of a physical server. For the data read/write speed, you can collect further details, that is, data read speed and data write speed. The figure below shows an example of data that can be collected into this record.

Figure 5–5: Example of collected data



### Note:

Information cannot be collected if an attempt to connect to the monitored physical server fails.

## Default values and values that can be changed

Item	Default value	Can it be changed?
Collection Interval	300	Yes
Collection Offset	0	Yes
Log	No	Yes
LOGIF	Blank	Yes

## ODBC key field

PI\_HPDI\_DISK\_ID

## Lifetime

None

## Record size

- Fixed portion: 937 bytes
- Variable portion: 649 bytes

## Field

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Record Type (INPUT_RECORD_TYPE)	The record name. This is always HPDI.	COPY	COPY	char (8)	No	--	--
Record Time (RECORD_TIME)	The time when the record was created.	COPY	COPY	time_t	No	--	--
Interval (INTERVAL)	Interval during which the information is collected. [Units: seconds]	COPY	FIXED	ulong	No	--	--
VA DeviceID (VADEVICEID)	The device ID of a monitored host.	COPY	COPY	string(256)	No	--	--
Disk ID (DISK_ID)	Disk ID. ID of the physical disk connected to the host machine.	COPY	FIXED	string (257)	No	No	--
Sampling Time (SAMPLING_TIME)	Sampling time. The time when the performance information is collected on the host machine. Displayed in the following format: <i>yyyy-mm-ddThh:mm [ ± hh:mm ] #1</i>	COPY	FIXED	string (32)	No	Blank	--
Speed (SPEED)#2	Data transfer speed. Speed of reads from or writes to the physical disk, made by the host machine. [Units: KBps]	HILO	AVG	double	No	0	--
Read Speed (READ_SPEED)#2	Reading data transfer speed. Speed of reads from the physical disk, made by the host machine. [Units: KBps]	HILO	AVG	double	No	0	--
Write Speed (WRITE_SPEED)#2	Writing data transfer speed. Speed of writes to the physical disk, made by the host machine. [Units: KBps]	HILO	AVG	double	No	0	--
Requests (REQUESTS)#2	Number of requests. • For VMware, Hyper-V and KVM Number of times that read/write requests from the physical server to the physical disk are processed.	HILO	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Read Requests (READ_REQUESTS)#2	Number of read requests. Number of times that read requests, made by the host machine to the physical disk, are processed.	HILO	ADD	double	No	0	--

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Write Requests (WRITE_REQUESTS) <sup>#2</sup>	Number of write requests. Number of times that write requests, made by the host machine to the physical disk, are processed.	HILO	ADD	double	No	0	--
Commands (COMMANDS)	Number of issued disk commands. Number of commands issued by the host machine to the physical disk.	HILO	ADD	double	No	0	Hyper-V KVM
Abort Commands (ABORT_COMMANDS)	Number of aborted disk commands. Number of aborted commands made by the host machine to the physical disk.	HILO	ADD	double	No	0	Hyper-V KVM
Abort Commands % (ABORT_COMMANDS_PERCENT)	Aborted disk command rate. Percentage of all commands, made by the host machine to a physical disk, that are aborted. Expression: "Abort Commands" field / "Commands" field	HILO	AVG	double	No	0	Hyper-V KVM
Bus Resets (BUS_RESETS)	Number of bus resets. Number of times the bus was reset for a disk on the host machine.	HILO	ADD	double	No	0	Hyper-V KVM

#1

The value used in [  $\pm hh:mm$  ] varies depending on the time zone of the monitored host. For example, if the monitored virtual environment is operating according to JST, +09:00 is displayed. If the monitored virtual environment is operating according to UTC, Z is displayed.

#2

For Hyper-V only, this field requires performance data to be collected at least twice.

## Host Status Detail (PD)

### Function

This record stores performance data that indicates the status of a physical server at a given point in time. This record is a single-instance record.

#### Notes:

Information, unless it is on one of the following fields, cannot be collected if an attempt to connect to the monitored physical server fails:

- Record Type
- Record Time
- Interval
- Status
- Reason

### Default values and values that can be changed

Item	Default value	Can it be changed?
Collection Interval	300	Yes
Collection Offset	0	Yes
Log	Yes	Yes
LOGIF	Blank	Yes

### ODBC key field

None

### Lifetime

None

### Record size

- Fixed portion: 1,595 bytes
- Variable portion: 0 bytes

### Fields

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Record Type (INPUT_RECORD_TYPE)	The record name. This is always PD.	--	COPY	char (8)	No	--	--
Record Time (RECORD_TIME)	The time when the record was created.	--	COPY	time_t	No	--	--
Interval (INTERVAL)	This is always 0.	--	FIXED	ulong	No	--	--

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
VA DeviceID (VADEVICEID)	The device ID of a monitored host.	--	COPY	string(256)	No	--	--
Status (STATUS)	Connection status. SUCCESS: Now executing ERROR: Connection failed	--	FIXED	string (8)	No	Blank	--
Host Name (HOST_NAME)	Connection destination host name.	--	FIXED	string (257)	No	Blank	--
Reason (REASON)	Cause when the "Status" field is ERROR:  Connection failed: Connection failed.  Authorization failed: Authorization failed.  Response invalid: There was an unintended response from the server.  Timeout: Collection of the performance data did not end within a given time period.  Collection error: Collection failed.  When the "Status" field is SUCCESS, this character string is empty.	--	FIXED	string (128)	No	Blank	--
Product (PRODUCT)	Product name of the virtual environment.	--	FIXED	string (257)	No	Blank	--
VM Count (VM_COUNT)	Number of virtual machines that exist on the connection destination hosts.	--	ADD	long	No	VMware: 0 Hyper-V: 0 KVM: 0	--
VM Active (VM_ACTIVE)	Number of virtual machines starting up on the connection destination hosts.	--	ADD	long	No	VMware: 0 Hyper-V: 0 KVM: 0	--



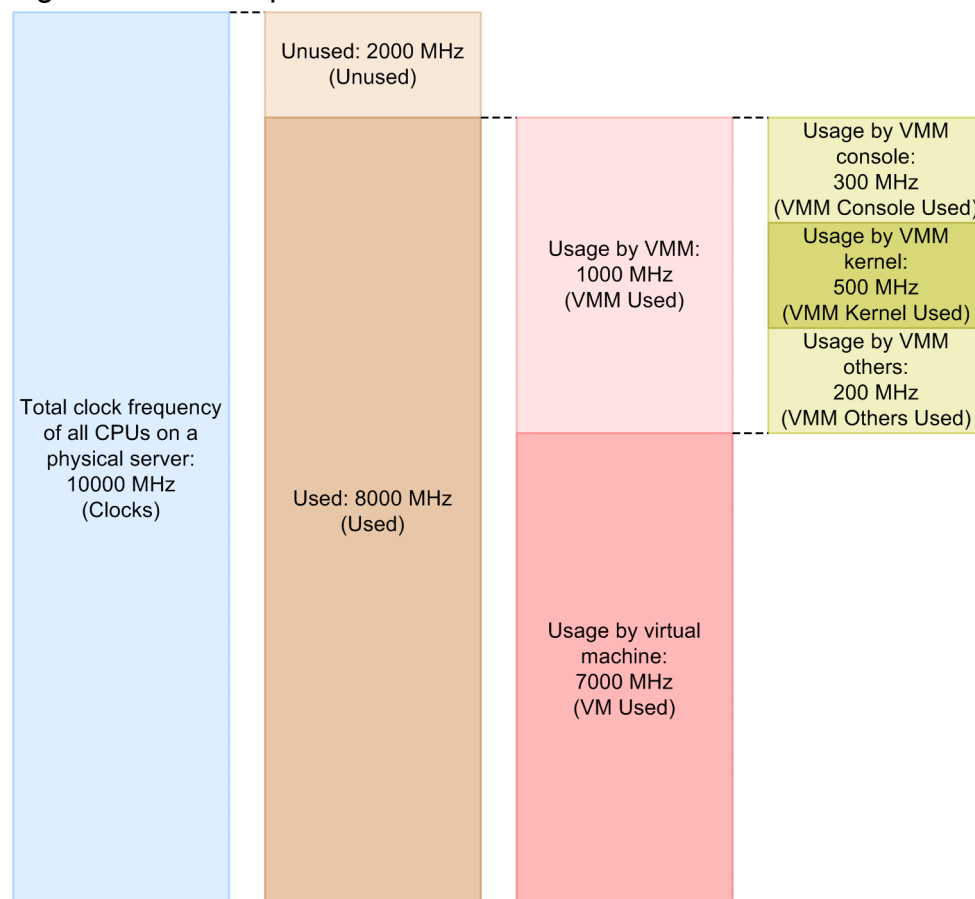
## Host Status (PI)

### Function

This record stores performance data on a physical server over a unit of time. This record is a single-instance record.

In this record, you can collect performance data such as CPU usage and details about a physical server, and CPU usage details by VMM. The figure below shows an example of data that can be collected in this record.

Figure 5–6: Example of collected data



#### Notes:

- Information cannot be collected if an attempt to connect to the monitored physical server fails.
- When VMware information is collected, the timing for collecting the usage, VMM usage, and virtual machine usage differs in VMware, and as a result the following relationship may not hold true in some cases:

Usage (Used) = VMM usage (VMM Used) + virtual machine usage (VM Used)

### Default values and values that can be changed

Item	Default value	Can it be changed?
Collection Interval	300	Yes
Collection Offset	0	Yes
Log	Yes	Yes
LOGIF	Blank	Yes

## ODBC key field

None

## Lifetime

None

## Record size

- Fixed portion: 1,485 bytes
- Variable portion: 0 bytes

## Fields

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Record Type (INPUT_RECORD_ TYPE)	The record name. This is always PI.	COPY	COPY	char (8)	No	--	--
Record Time (RECORD_TIME)	The time when the record was created.	COPY	COPY	time_t	No	--	--
Interval (INTERVAL)	Interval during which the information is collected. [Units: seconds]	COPY	FIXED	ulong	No	--	--
VA DeviceID (VADEVICEID)	The device ID of a monitored host.	COPY	COPY	string(2 56)	No	--	--
Clocks (CLOCKS)	Clock frequency of the CPU resource. The total value of the clock frequencies of the physical CPUs installed on the host machine.	COPY	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Count (COUNT)	Number of physical CPU cores in the CPU resources. Number of physical CPU cores installed on the host machine.	COPY	ADD	long	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Sampling Time (SAMPLING_TIME )	Sampling time. The time when the performance information is collected on the host machine. Displayed in the following format: <i>yyyy-mm-ddThh:mm [ ± hh:mm ] #1</i>	COPY	FIXED	string (32)	No	Blank	--
Used (USED) <sup>#2,#3</sup>	Amount of used CPU resources. Amount of CPU resources used by the host machine. [Units: MHz]	HILO	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
VMM Used (VMM_USED) <sup>#2,#3</sup>	Amount of CPU resources used by the VMM. <ul style="list-style-type: none"><li>• For VMware, Hyper-V and KVM</li></ul>	HILO	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
VMM Used (VMM_USED)#2,#3	Amount of CPU resources used by the virtual machine monitor. [Units: MHz]	HILO	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
VM Used (VM_USED)#2,#3	Amount of CPU resources used by the VM. Amount of CPU resources used by the virtual machine. [Units: MHz]	HILO	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
VMM Console Used (VMM_CONSOLE_USED)#3	Amount of CPU resources used by the VMM console. Amount of CPU resources used by the virtual system console. [Units: MHz]	HILO	ADD	double	No	0	Hyper-V
VMM Kernel Used (VMM_KERNEL_USED)#3	Amount of CPU resources used by the VMM kernel. • For VMware and KVM Amount of CPU resources used by the virtual machine monitor kernel. [Units: MHz]	HILO	ADD	double	No	VMware: 0 KVM: 0	Hyper-V
VMM Others Used (VMM_OTHERS_USED)#3	Amount of CPU resources used by non-VMM processes. • For VMware and KVM Amount of CPU resources used in the virtual machine monitor by something other than the virtual machine monitor console and the virtual machine monitor kernel. [Units: MHz]	HILO	ADD	double	No	VMware: 0 KVM: 0	Hyper-V
Unused (UNUSED)	Amount of unused CPU resources. Amount of unused host CPU resources. [Units: MHz]	HILO	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Used % (USED_PERCENT)#2,#3	Usage rate of CPU resources. Percentage of CPU resources used by the host machine. [Units: %] Expression: "Used" field / "Clocks" field *100	HILO	AVG	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
VMM Used % (VMM_USED_PERCENT)#2,#3	Usage rate of CPU resources by the VMM. • For VMware, Hyper-V and KVM Percentage of CPU resources used by the virtual machine monitor.	HILO	AVG	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
VMM Used % (VMM_USED_PERCENT) <sup>#2,#3</sup>	[Units: %] Expression: "VMM Used" field / "Clocks" field	HILO	AVG	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
VM Used % (VM_USED_PERCENT) <sup>#2,#3</sup>	Usage rate of CPU resources by the VM. Percentage of CPU resources used by virtual machines. [Units: %] Expression: "VM Used" field / "Clocks" field	HILO	AVG	double	No	0	--
VMM Console Used % (VMM_CONSOLE_USED_PERCENT) <sup>#3</sup>	Usage rate of CPU resources by the VMM console. Percentage of CPU resources used by the virtual system console. [Units: %] Expression: "VMM Console Used" field / "Clocks" field	HILO	AVG	double	No	0	Hyper-V
VMM Kernel Used % (VMM_KERNEL_USED_PERCENT) <sup>#3</sup>	Usage rate of CPU resources by the VMM kernel. • For VMware and KVM Percentage of CPU resources used by the virtual machine monitor kernel. [Units: %] Expression: "VMM Kernel Used" field / "Clocks" field	HILO	AVG	double	No	VMware: 0 KVM: 0	Hyper-V
VMM Others Used % (VMM_OTHERS_USED_PERCENT) <sup>#3</sup>	Usage rate of CPU resources by non-VMM processes. • For VMware and KVM Percentage of CPU resources used in the virtual machine monitor by something other than the virtual machine monitor console and the virtual machine monitor kernel. [Units: %] Expression: "VMM Others Used" field / "Clocks" field	HILO	AVG	double	No	VMware: 0 KVM: 0	Hyper-V
Unused % (UNUSED_PERCENT)	Non-usage rate of CPU resources. Percentage of unused CPU resources. [Units: %] Expression: "Unused" field / "Clocks" field	HILO	AVG	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--

#1

The value used in [  $\pm hh:mm$  ] varies depending on the time zone of the monitored host. For example, if the monitored virtual environment is operating according to JST, +09:00 is displayed. If the monitored virtual environment is operating according to UTC, Z is displayed.

#2

For Hyper-V, this field requires performance data to be collected at least twice.

#3

For KVM, this field requires performance data to be collected at least twice.

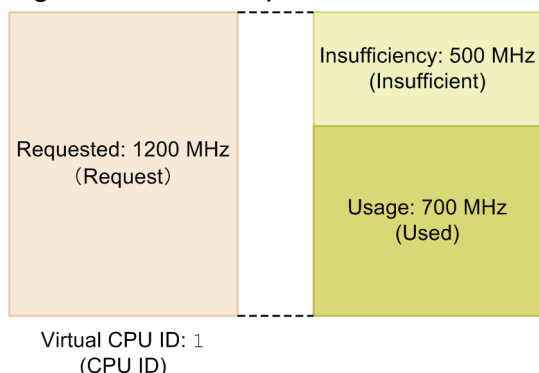
## VM CPU Status (PI\_VCI)

### Function

This record stores performance data on a virtual CPU being used by a virtual machine over a unit of time. This record is a multi-instance record.

In this record, you can collect performance data such as CPU usage by a virtual machine. The CPU usage can be divided into CPU usage and CPU insufficiency. The figure below shows an example of data that can be collected in this record.

Figure 5–7: Example of collected data



#### Note:

- Information cannot be collected if an attempt to connect to the monitored physical server fails.
- For Hyper-V, if there are multiple virtual machines with the same virtual machine name, PFM - RM for Virtual Machine might not be able to collect the correct information.
- For Hyper-V, any special character contained in the virtual machine name is converted to a different character and then stored in the VM Name field. The conversion rules are as follows:

Before conversion	After conversion
/ and \	–
# and *	—
(	[
)	]

### Default values and values that can be changed

Item	Default value	Can it be changed?
Collection Interval	300	Yes
Collection Offset	0	Yes
Log	No	Yes
LOGIF	Blank	Yes

### ODBC key field

PI\_VCI\_VM\_ID

PI\_VCI\_CPU\_ID

## Lifetime

None

## Record size

- Fixed portion: 937 bytes
- Variable portion: 930 bytes

## Fields

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Record Type (INPUT_RECORD_TYPE)	The record name. This is always VCI.	COPY	COPY	char (8)	No	--	--
Record Time (RECORD_TIME)	The time when the record was created.	COPY	COPY	time_t	No	--	--
Interval (INTERVAL)	Interval during which the information is collected. [Units: seconds]	COPY	FIXED	ulong	No	--	--
VA DeviceID (VADEVICEID)	The device ID of a monitored host.	COPY	COPY	string(256)	No	--	--
VM ID (VM_ID)	ID of the virtual machine. For Hyper-V, the root partition is set to Root.	COPY	FIXED	string (64)	No	No	--
CPU ID (CPU_ID)	ID of the virtual CPU.	COPY	FIXED	string (32)	No	No	--
VM Host Name (VM_HOST_NAME)	Host name of the virtual machine.	COPY	FIXED	string(257)	No	--	Hyper-V KVM
VM Name (VM_NAME)	Name of the virtual machine.	COPY	FIXED	string (257)	No	Blank	--
Sampling Time (SAMPLING_TIME)	Sampling time. The time when the performance information is collected on the host machine. Displayed in the following format: <i>yyyy-mm-ddThh:mm [ ± hh:mm ] #1</i>	COPY	FIXED	string (32)	No	Blank	--
Used (USED) <sup>#2</sup>	Amount of used virtual CPU resources. CPU resources that could run a virtual machine on a virtual CPU. [Units: MHz]	HILO	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Insufficient (INSUFFICIENT)	Amount of virtual CPU insufficiency. CPU resources that could not run a virtual machine on a virtual CPU.	HILO	ADD	double	No	VMware: 0	Hyper-V KVM

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Insufficient (INSUFFICIENT)	[Units: MHz]	HILO	ADD	double	No	VMware: 0	Hyper-V KVM
Request (REQUEST)	Amount of virtual CPU requests. Resources required to run virtual machines. (This is the total of the amount of allocated CPUs added to the amount of unallocated CPUs.) [Units: MHz]	HILO	ADD	double	No	VMware: 0	Hyper-V KVM
Used % (USED_PERCENT) <sup>#2</sup>	Usage rate of virtual CPUs. Percentage of CPU resources that are allocated to a virtual CPU. [Units: %] Expression: "Used" field / "Clocks" field of "PD_HCI" record There is no need to set the PI_HCI record to the collection setting (Log=Y).	HILO	AVG	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Insufficient % (INSUFFICIENT_PERCENT)	Insufficiency rate of virtual CPUs. Percentage of CPU resources that are unallocated to a virtual CPU. [Units: %] Expression: "Insufficient" field / "Clocks" field of "PI_HCI" record There is no need to set the PI_HCI record to the collection setting (Log=Y).	HILO	AVG	double	No	VMware: 0	Hyper-V KVM
Request % (REQUEST_PERCENT)	Request rate of virtual CPUs. Percentage of CPU resources for which virtual CPUs are requested. [Units: %] Expression: "Request" field / "Clocks" field of "PD_HCI" record There is no need to set the PI_HCI record to the collection setting (Log=Y).	HILO	AVG	double	No	VMware: 0	Hyper-V KVM
Used Per Request (USED_PER_REQUEST)	Usage ratio of virtual CPUs. Percentage of the CPU resources, required to run a virtual machine, that are CPU resources that could run a virtual machine. [Units: %] Expression: "Used" field / "Request" field	HILO	AVG	double	No	VMware: 0	Hyper-V KVM
Insufficient Per Request	Insufficiency rate for virtual CPUs.	HILO	AVG	double	No	VMware: 0	Hyper-V KVM



PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
(INSUFFICIENT_PER_REQUEST)	Percentage of the CPU resources, required to run a virtual machine, that are CPU resources that could not run a virtual machine. [Units: %] Expression: "Insufficient" field / "Request" field	HILO	AVG	double	No	VMware: 0	Hyper-V KVM

#1

The value used in [  $\pm hh:mm$  ] varies depending on the time zone of the monitored host. For example, if the monitored virtual environment is operating according to JST, +09:00 is displayed. If the monitored virtual environment is operating according to UTC, Z is displayed.

#2

For Hyper-V or KVM, this field requires performance data to be collected at least twice.

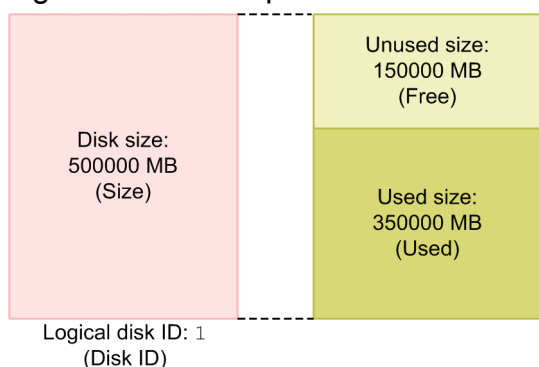
## VM Logical Disk Status (PI\_VLDI)

### Function

This record stores performance data on a logical disk being used by a virtual machine over a unit of time. This record is a multi-instance record.

In this record, you can collect performance data such as the size of the logical disk that can be used by a virtual machine. The disk space can be divided into used space and unused space. The figure below shows an example of data that can be collected in this record.

Figure 5–8: Example of collected data



#### Note:

Information cannot be collected if an attempt to connect to the monitored physical server fails.

### Default values and values that can be changed

Item	Default value	Can it be changed?
Collection Interval	300	Yes
Collection Offset	0	Yes
Log	No	Yes
LOGIF	Blank	Yes

### ODBC key field

PI\_VLDI\_VM\_ID

PI\_VLDI\_DISK\_ID

### Lifetime

None

### Record size

- Fixed portion: 937 bytes
- Variable portion: 1,011 bytes

## Fields

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Record Type (INPUT_RECORD_TYPE)	The record name. This is always VLDI.	COPY	COPY	char (8)	No	--	Hyper-V KVM
Record Time (RECORD_TIME)	The time when the record was created.	COPY	COPY	time_t	No	--	Hyper-V KVM
Interval (INTERVAL)	Interval during which the information is collected. [Units: seconds]	COPY	FIXED	ulong	No	--	Hyper-V KVM
VA DeviceID (VADEVICEID)	The device ID of a monitored host.	COPY	COPY	string(256)	No	--	Hyper-V KVM
VM ID (VM_ID)	ID of the virtual machine.	COPY	FIXED	string (64)	No	No	Hyper-V KVM
Disk_ID (DISK_ID)	Disk ID.	COPY	FIXED	string (257)	No	No	Hyper-V KVM
VM Host Name (VM_HOST_NAME)	Host name of the virtual machine.	COPY	FIXED	string(257)	No	Blank	Hyper-V KVM
VM Name (VM_NAME)	Name of the virtual machine.	COPY	FIXED	string (257)	No	Blank	Hyper-V KVM
Sampling Time (SAMPLING_TIME)	Sampling time. The time when the performance information is collected on the host machine. Displayed in the following format: <i>yyyy-mm-ddThh:mm [ ± hh:mm ] #</i>	COPY	FIXED	string (32)	No	Blank	Hyper-V KVM
Size (SIZE)	Disk size. [Units: MB]	HILO	ADD	double	No	0	Hyper-V KVM
Used (USED)	Size of used space. [Units: MB]	HILO	ADD	double	No	0	Hyper-V KVM
Free (FREE)	Size of free space. [Units: MB]	HILO	ADD	double	No	0	Hyper-V KVM
Used % (USED_PERCENT)	Usage rate. [Units: %] Expression: "Used" field / "Size" field	HILO	AVG	double	No	0	Hyper-V KVM

#

The value used in [ ± hh:mm ] varies depending on the time zone of the monitored host. For example, if the monitored virtual environment is operating according to JST, +09:00 is displayed. If the monitored virtual environment is operating according to UTC, Z is displayed.

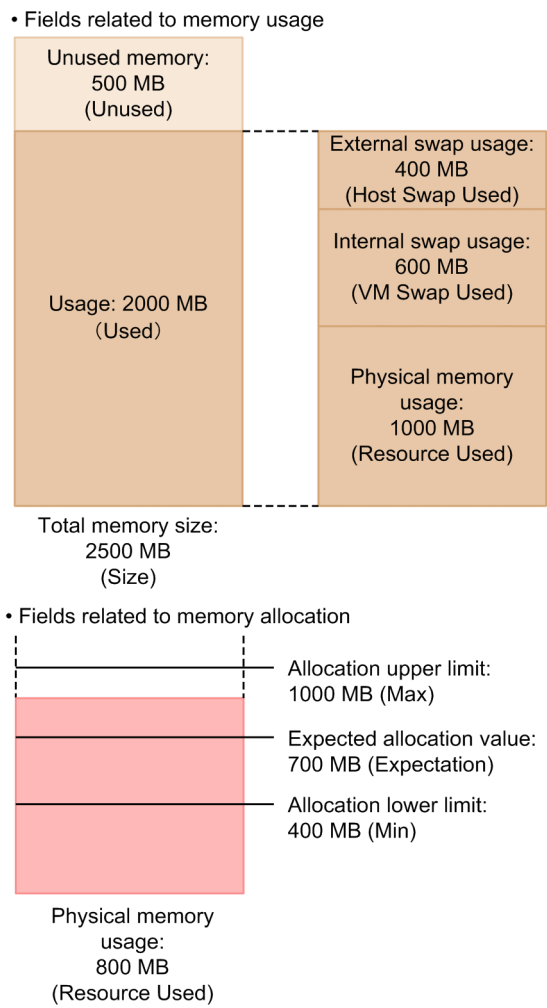
# VM Memory Status (PI\_VMI)

## Function

This record stores performance data on virtual memory being used by a virtual machine over a unit of time. This record is a multi-instance record.

In this record, you can collect performance data such as details about the memory being used by the virtual machine and memory allocation. You can also collect performance data on the swap that the virtual machine is using. The figure below shows an example of data that can be collected in this record.

Figure 5–9: Example of collected data



*Note:*

Information cannot be collected if an attempt to connect to the monitored physical server fails.

## Default values and values that can be changed

Item	Default value	Can it be changed?
Collection Interval	300	Yes
Collection Offset	0	Yes
Log	No	Yes

Item	Default value	Can it be changed?
LOGIF	Blank	Yes

## ODBC key field

PI\_VMI\_VM\_ID

## Lifetime

None

## Record size

- Fixed portion: 937 bytes
- Variable portion: 786 bytes

## Fields

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Record Type (INPUT_RECORD_TYPE)	The record name. This is always VMI.	COPY	COPY	char (8)	No	--	--
Record Time (RECORD_TIME)	The time when the record was created.	COPY	COPY	time_t	No	--	--
Interval (INTERVAL)	Interval during which the information is collected. [Units: seconds]	COPY	FIXED	ulong	No	--	--
VA DeviceID (VADEVICEID)	The device ID of a monitored host.	COPY	COPY	string (256)	No	--	--
VM ID (VM_ID)	ID of the virtual machine.	COPY	FIXED	string (64)	No	No	--
VM Host Name (VM_HOST_NAME)	Host name of the virtual machine.	COPY	FIXED	string (257)	No	Blank	Hyper-V KVM
VM Name (VM_NAME)	Name of the virtual machine.	COPY	FIXED	string (257)	No	Blank	--
Sampling Time (SAMPLING_TIME)	Sampling time. The time when the performance information is collected on the host machine. Displayed in the following format: <i>yyyy-mm-ddThh:mm [ ± hh:mm ]<sup>#</sup></i>	COPY	FIXED	string (32)	No	Blank	--
Size (SIZE)	Memory size. Memory size on the virtual machine. [Units: MB]	COPY	ADD	double	No	0	--
Used (USED)	Amount of used memory.	COPY	ADD	double	No	0	--

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Used (USED)	Amount of memory used by the virtual machine. [Units: MB]	COPY	ADD	double	No	0	--
Resource Used (RESOURCE_USED)	Amount of used memory resources. Memory resources used by the virtual machine. [Units: MB]	COPY	ADD	double	No	0	--
VM Swap Used (VM_SWAP_USED)	Amount of internal swap usage. Amount of swaps used by the virtual machine. [Units: MB]	COPY	ADD	double	No	0	Hyper-V
Host Swap Used (HOST_SWAP_USED)	Amount of used external swaps. Amount of the swap area, on the host machine, used by the virtual machine. [Units: MB]	COPY	ADD	double	No	0	Hyper-V
Unused (UNUSED)	Amount of unused memory. Size of free memory in the virtual machine. [Units: MB] For Hyper-V and KVM, this field is set to 0.	COPY	ADD	double	No	0	--
Used % (USED_PERCENT)	Memory usage rate. Percentage of used memory in the memory of the virtual machine. [Units: %] Expression: "Used" field / "Size" field For Hyper-V and KVM, this field is set to 100.	COPY	AVG	double	No	0	--
Resource Used % (RESOURCE_USED_PERCENT)	Usage rate of memory resources. Percentage of memory resources used in the memory of the virtual machine. [Units: %] Expression: "Resource Used" field / "Size" field For Hyper-V, this field is set to 100.	COPY	AVG	double	No	0	--
VM Swap Used % (VM_SWAP_USED_PERCENT)	Usage rate of internal swaps. Percentage of memory used for internal swaps in the memory of the virtual machine. [Units: %] Expression: "VM Swap Used" field / "Size" field	COPY	AVG	double	No	0	Hyper-V

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Host Swap Used % (HOST_SWAP_USED_PERCENT)	Usage rate of external swaps. Percentage of memory used for external swaps in the memory of the virtual machine. [Units: %] Expression: "Host Swap Used" field / "Size" field	COPY	AVG	double	No	0	Hyper-V
VM Swap IO (VM_SWAP_IO)	Internal swap I/Os. Amount of data internally swapped by the virtual machine. [Units: MB]	COPY	ADD	double	No	0	Hyper-V KVM
VM Swap In (VM_SWAP_IN)	Internal swap-in. Amount of data internally swapped in by the virtual machine. [Units: MB]	COPY	ADD	double	No	0	Hyper-V KVM
VM Swap Out (VM_SWAP_OUT)	Internal swap-out. Amount of data internally swapped out by the virtual machine. [Units: MB]	COPY	ADD	double	No	0	Hyper-V KVM
Working Size (WORKING_SIZE)	Working set size. Amount for statistics about memory recently accessed within the virtual machine. [Units: MB]	COPY	ADD	double	No	0	Hyper-V
Working Size % (WORKING_SIZE_PERCENT)	Working set size rate. Percentage of all memory, on the virtual machine, that was recently accessed. [Units: %] Expression: "Working Size" field / "Size" field	COPY	AVG	double	No	0	Hyper-V
Share (SHARE)	Memory allocation ratio. Reference for the balance point for memory allocation when multiple virtual machines require memory resources at the same time.	COPY	AVG	double	No	0	Hyper-V KVM
Max (MAX)	Maximum value for memory allocation. The maximum value for memory resources allocated to a virtual machine. [Units: MB] -1: No limit.	COPY	ADD	double	No	0	Hyper-V
Min (MIN)	Minimum value for memory allocation.	COPY	ADD	double	No	0	Hyper-V KVM

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Min (MIN)	The minimum value for memory resources allocated to a virtual machine. [Units: MB]	COPY	ADD	double	No	0	Hyper-V KVM
Expectation (EXPECTATION)	Balance value for memory allocation. The memory resources allocated to memory when multiple virtual machines require memory resources at the same time. [Units: MB]	COPY	ADD	double	No	0	Hyper-V KVM
Max % (MAX_PERCENT)	Maximum % for memory allocation. Percentage of the memory size, on the virtual machine, that is the maximum value for memory allocation. [Units: %] Expression: For VMware: "Max" field / "Size" field of <code>PI_VMI</code> record For KVM: "Max" field / "Size" field of <code>PI_HMI</code> record	COPY	AVG	double	No	0	Hyper-V
Min % (MIN_PERCENT)	Minimum % for memory allocation. Percentage of the memory size, on the virtual machine, that is the minimum value for memory allocation. [Units: %] Expression: "Min" field / "Size" field of <code>PI_VMI</code> record	COPY	AVG	double	No	0	Hyper-V KVM
Expectation % (EXPECTATION_PERCENT)	Balance point for memory allocation. Percentage of memory resources that is the balance point for memory allocation when multiple virtual machines require memory resources at the same time. [Units: %] Expression: "Expectation" field / "Size" field of <code>PI_HMI</code> record	COPY	AVG	double	No	0	Hyper-V KVM

#

The value used in [  $\pm hh:mm$  ] varies depending on the time zone of the monitored host. For example, if the monitored virtual environment is operating according to JST, +09:00 is displayed. If the monitored virtual environment is operating according to UTC, Z is displayed.



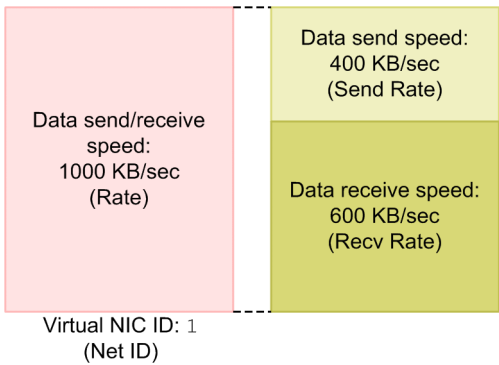
# VM Network Status (PI\_VNI)

## Function

This record stores performance data on a virtual NIC being used by a virtual machine over a unit of time. This record is a multi-instance record.

In this record, you can collect performance data such as the data send/receive speed of the virtual NIC. The data send/receive speed can be divided into data receive speed and data send speed. The figure below shows an example of data that can be collected in this record.

Figure 5–10: Example of collected data



Note:

- Information cannot be collected if an attempt to connect to the monitored physical server fails.
- For Hyper-V, specific symbols included in a network identifier are converted to other symbols when the network identifier is stored in the Net ID field. The conversion rules are as follows:

Before conversion	After conversion
/ and \	-
# and *	_
(	[
)	]

## Default values and values that can be changed

Item	Default value	Can it be changed?
Collection Interval	300	Yes
Collection Offset	0	Yes
Log	No	Yes
LOGIF	Blank	Yes

## ODBC key field

PI\_VNI\_VM\_ID

PI\_VNI\_NET\_ID

## Lifetime

None

## Record size

- Fixed portion: 937 bytes
- Variable portion: 975 bytes

## Fields

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Record Type (INPUT_RECORD_TYPE)	The record name. This is always VNI.	COPY	COPY	char (8)	No	--	--
Record Time (RECORD_TIME)	The time when the record was created.	COPY	COPY	time_t	No	--	--
Interval (INTERVAL)	Interval during which the information is collected. [Units: seconds]	COPY	FIXED	ulong	No	--	--
VA DeviceID (VADEVICEID)	The device ID of a monitored host.	COPY	COPY	string (256)	No	--	--
VM ID (VM_ID)	ID of the virtual machine. For Hyper-V, the root partition is set to Root.	COPY	FIXED	string (64)	No	No	--
Net ID (NET_ID)	Network ID.	COPY	FIXED	string (257)	No	No	--
VM Host Name (VM_HOST_NAME)	Host name of the virtual machine.	COPY	FIXED	string (257)	No	Blank	Hyper-V KVM
VM Name (VM_NAME)	Name of the virtual machine.	COPY	FIXED	string (257)	No	Blank	--
Sampling Time (SAMPLING_TIME)	Sampling time. The time when the performance information is collected on the host machine. Displayed in the following format: <i>yyyy-mm-ddThh:mm [ ± hh:mm ] #1</i>	COPY	FIXED	string (32)	No	Blank	--
Rate (RATE) <sup>#2</sup>	Speed of transmission to and from the network by a virtual machine. [Units: KBps]	HILO	AVG	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Send Rate (SEND_RATE) <sup>#2</sup>	Speed of sending to the network by a virtual machine. [Units: KBps]	HILO	AVG	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Recv Rate (RECV_RATE) <sup>#2</sup>	Speed of receiving from the network by a virtual machine. [Units: KBps]	HILO	AVG	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--

#1

The value used in [  $\pm hh:mm$  ] varies depending on the time zone of the monitored host. For example, if the monitored virtual environment is operating according to JST, +09:00 is displayed. If the monitored virtual environment is operating according to UTC, Z is displayed.

#2

For Hyper-V or KVM, this field requires performance data to be collected at least twice.

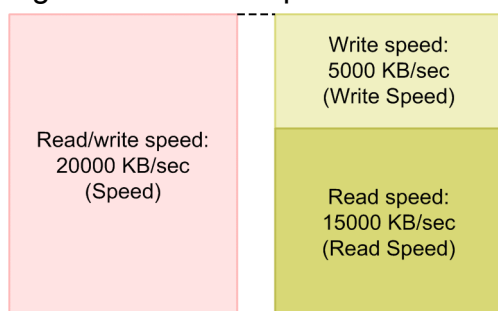
## VM Physical Disk Status (PI\_VPDI)

### Function

This record stores performance data on a physical disk being used by a virtual machine over a unit of time. This record is a multi-instance record.

In this record, you can collect performance data such as the data read/write speed of the physical disk being used by the virtual machine. For the data read/write speed, you can collect further details, that is, data write speed and data read speed. The figure below shows an example of data that can be collected in this record.

Figure 5–11: Example of collected data



Physical disk ID: 1  
(Disk ID)

*Note:*

- Information cannot be collected if an attempt to connect to the monitored physical server fails.
- For Hyper-V, any special character contained in the disk name is converted to a different character and then stored in the Disk ID field. The conversion rules are as follows:

Before conversion	After conversion
# and \	—
(	[
)	]

### Default values and values that can be changed

Item	Default value	Can it be changed?
Collection Interval	300	Yes
Collection Offset	0	Yes
Log	No	Yes
LOGIF	Blank	Yes

### ODBC key field

PI\_VPDI\_VM\_ID

PI\_VPDI\_DISK\_ID

## Lifetime

None

## Record size

- Fixed portion: 937 bytes
- Variable portion: 1,227 bytes

## Fields

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Record Type (INPUT_RECORD_TYPE)	The record name. This is always VPDI.	COPY	COPY	char (8)	No	--	--
Record Time (RECORD_TIME)	The time when the record was created.	COPY	COPY	time_t	No	--	--
Interval (INTERVAL)	Interval during which the information is collected. [Units: seconds]	COPY	FIXED	ulong	No	--	--
VA DeviceID (VADEVICEID)	The device ID of a monitored host.	COPY	COPY	string (256)	No	--	--
VM ID (VM_ID)	ID of the virtual machine.	COPY	FIXED	string (64)	No	No	--
Disk ID (DISK_ID)	ID of the physical disk (or file) used by the virtual machine.	COPY	FIXED	string (257)	No	No	--
VM Host Name (VM_HOST_NAME)	Host name of the virtual machine.	COPY	FIXED	string (257)	No	Blank	Hyper-V KVM
VM Name (VM_NAME)	Name of the virtual machine.	COPY	FIXED	string (257)	No	Blank	--
Sampling Time (SAMPLING_TIME)	Sampling time. The time when the performance information is collected on the host machine. Displayed in the following format: <i>yyyy-mm-ddThh:mm [ ± hh:mm ] #1</i>	COPY	FIXED	string (32)	No	Blank	--
Speed (SPEED) <sup>#2,#3</sup>	Data transfer speed. Speed of reads from or writes to the physical disk, made by the virtual machine. [Units: KBps]	HILO	AVG	double	No	0	--
Read Speed (READ_SPEED) <sup>#2,#3</sup>	Reading data transfer speed. Speed of reads from the physical disk, made by the virtual machine. [Units: KBps]	HILO	AVG	double	No	0	--

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Write Speed (WRITE_SPEED) <sup>#2, #3</sup>	Writing data transfer speed. Speed of writes to the physical disk, made by the virtual machine. [Units: KBps]	HILO	AVG	double	No	0	--
Requests (REQUESTS) <sup>#3</sup>	Number of requests. <ul style="list-style-type: none"> <li>For VMware and KVM Number of times that read/write requests from the virtual machine to the physical disk are processed.</li> </ul>	HILO	ADD	double	No	VMware: 0 KVM: 0	Hyper-V
Read Requests (READ_REQUESTS) <sup>#3</sup>	Number of read requests. Number of times that read requests, made by the virtual machine to the physical disk, are processed.	HILO	ADD	double	No	0	Hyper-V
Write Requests (WRITE_REQUESTS) <sup>#3</sup>	Number of write requests. Number of times that write requests, made by the virtual machine to the physical disk, are processed.	HILO	ADD	double	No	0	Hyper-V
Commands (COMMANDS)	Number of issued disk commands. Number of commands issued by the virtual machine to the physical disk.	HILO	ADD	double	No	0	Hyper-V KVM
Abort Commands (ABORT_COMMANDS)	Number of aborted disk commands. Number of aborted commands made by the virtual machine to the physical disk.	HILO	ADD	double	No	0	Hyper-V KVM
Abort Commands % (ABORT_COMMANDS_PERCENT)	Aborted disk command rate. Percentage of all commands, made by the virtual machine to a physical disk, that are aborted. Expression: "Abort Commands" field / "Commands" field	HILO	AVG	double	No	0	Hyper-V KVM
Bus Resets (BUS_RESETS)	Number of bus resets. Number of times the bus was reset for a disk on the virtual machine.	HILO	ADD	double	No	0	Hyper-V KVM

#1

The value used in [ ± hh:mm ] varies depending on the time zone of the monitored host. For example, if the monitored virtual environment is operating according to JST, +09:00 is displayed. If the monitored virtual environment is operating according to UTC, Z is displayed.

#2

For Hyper-V, this field requires performance data to be collected at least twice.

#3

For KVM, this field requires performance data to be collected at least twice.

## VM Status Detail (PD\_VM)

### Function

This record stores performance data that indicates the status of a virtual machine at a given point in time. This record is a multi-instance record.

#### Note:

Information cannot be collected if an attempt to connect to the monitored physical server fails.

### Default values and values that can be changed

Item	Default value	Can it be changed?
Collection Interval	300	Yes
Collection Offset	0	Yes
Log	No	Yes
LOGIF	Blank	Yes

### ODBC key field

PD\_VM\_VM\_ID

### Lifetime

None

### Record size

- Fixed portion: 937 bytes
- Variable portion: 658 bytes

### Fields

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Record Type (INPUT_RECORD_TYPE)	The record name. This is always VM.	--	COPY	char (8)	No	--	--
Record Time (RECORD_TIME)	The time when the record was created.	--	COPY	time_t	No	--	--
Interval (INTERVAL)	This is always 0.	--	FIXED	ulong	No	--	--
VA DeviceID (VADEVICEID)	The device ID of a monitored host.	--	COPY	string (256)	No	--	--
VM ID (VM_ID)	ID of the virtual machine. For Hyper-V, the root partition is set to Root.	--	FIXED	string (64)	No	No	--
VM Host Name	Host name of the virtual machine.	--	FIXED	string (257)	No	Blank	Hyper-V

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
(VM_HOST_NAME)	Host name of the virtual machine.	--	FIXED	string (257)	No	Blank	KVM
VM Name (VM_NAME)	Name of the virtual machine.	--	FIXED	string (257)	No	Blank	--
Information (INFORMATION)	Information about the virtual machine.	--	FIXED	string (64)	No	Blank	Hyper-V
Status (STATUS)	<p>Connection status</p> <p>For VMware:</p> <ul style="list-style-type: none"> <li>• ON: Running</li> <li>• OFF: Stopped</li> <li>• SUSPENDED: Stopped temporarily</li> <li>• UNKNOWN: Unknown status</li> </ul> <p>For Hyper-V:</p> <ul style="list-style-type: none"> <li>• ON: Running</li> <li>• OFF: Stopped</li> <li>• PAUSED: Paused</li> <li>• SUSPENDED: Stopped temporarily</li> <li>• STARTING: Under start processing</li> <li>• SNAPSHOTTING: Obtaining a snapshot</li> <li>• SAVING: Save processing underway</li> <li>• STOPPING: Stop processing underway</li> <li>• PAUSING: Paused</li> <li>• RESUMING: Resuming</li> <li>• UNKNOWN: Unknown status</li> </ul> <p>For KVM:</p> <ul style="list-style-type: none"> <li>• ON: Running</li> <li>• OFF: Stopped</li> <li>• PAUSED: Paused</li> <li>• STOPPING: Stop processing underway</li> <li>• CRASHED: Faulty</li> <li>• UNKNOWN: Unknown status</li> </ul>	--	FIXED	string (16)	No	Blank	--



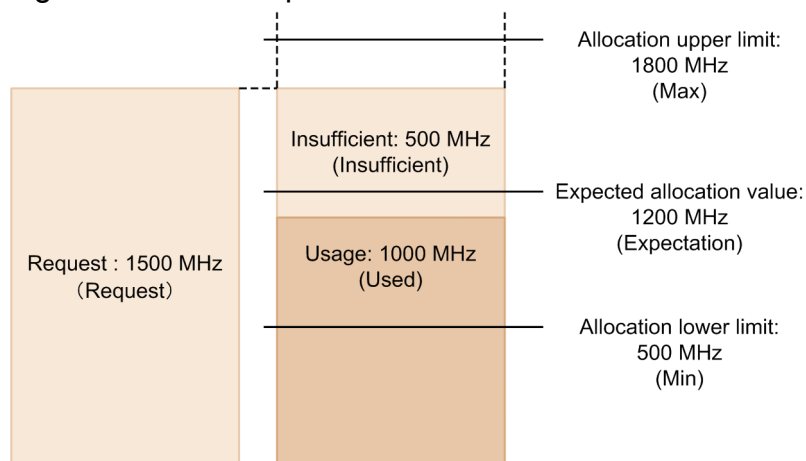
## VM Status (PI\_VI)

### Function

This record stores performance data on a virtual machine over a unit of time. This record is a multi-instance record.

In this record, you can collect performance data such as CPU usage by the virtual machine, CPU insufficiency, and CPU allocation. The figure below shows an example of data that can be collected in this record.

Figure 5–12: Example of collected data



*Note:*

Information cannot be collected if an attempt to connect to the monitored physical server fails.

### Default values and values that can be changed

Item	Default value	Can it be changed?
Collection Interval	300	Yes
Collection Offset	0	Yes
Log	Yes	Yes
LOGIF	Blank	Yes

### ODBC key field

PI\_VI\_VM\_ID

### Lifetime

None

### Record size

- Fixed portion: 937 bytes
- Variable portion: 1,146 bytes

## Fields

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Record Type (INPUT_RECORD_TYPE)	The record name. This is always VI.	COPY	COPY	char (8)	No	--	--
Record Time (RECORD_TIME)	The time when the record was created.	COPY	COPY	time_t	No	--	--
Interval (INTERVAL)	Interval during which the information is collected. [Units: seconds]	COPY	FIXED	ulong	No	--	--
VA DeviceID (VADEVICEID)	The device ID of a monitored host.	COPY	COPY	string (256)	No	--	--
VM ID (VM_ID)	ID of the virtual machine. For Hyper-V, the root partition is set to Root.	COPY	FIXED	string (64)	No	No	--
Clocks (CLOCKS) <sup>#1</sup>	Clock frequency of the CPU resources. The value that is the total of the clock frequencies of the physical CPUs allocated to the virtual machine. [Units: MHz]	COPY	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Count (COUNT)	Number of physical CPU cores in the CPU resources. The number of cores of the physical CPUs allocated to the virtual machine.	COPY	ADD	long	No	VMware: 0 Hyper-V: 0 KVM: 0	--
VM Host Name (VM_HOST_NAME)	Host name of the virtual machine.	COPY	FIXED	string(257)	No	Blank	Hyper-V KVM
VM Name (VM_NAME)	Name of the virtual machine.	COPY	FIXED	string (257)	No	Blank	--
Sampling Time (SAMPLING_TIME)	Sampling time. The time when the performance information is collected on the host machine. Displayed in the following format: <i>yyyy-mm-ddThh:mm [ ± hh:mm ]<sup>#2</sup></i>	COPY	FIXED	string (32)	No	Blank	--
Used (USED) <sup>#3</sup>	CPU usage amount. CPU resources that could run a virtual machine on a physical CPU. [Units: MHz]	HILO	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Insufficient (INSUFFICIENT)	Amount of CPU insufficiency. CPU resources that could not run a virtual machine on a physical CPU. [Units: MHz]	HILO	ADD	double	No	VMware: 0	Hyper-V KVM

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Request (REQUEST)	Amount of CPU requests. The amount of CPU resources required to run a virtual machine. (This is the total allocated resources added to the total unallocated resources.) [Units: MHz]	HILO	ADD	double	No	VMware: 0	Hyper-V KVM
Host Used % (HOST_USED_PERCENT)	Usage rate of host CPUs. Percentage of total physical CPU resources that were executed on a physical CPU. [Units: %] Expression: "Used" field / "Clocks" field of PI record	HILO	AVG	double	No	VMware: 0 KVM: 0	Hyper-V
Used % (USED_PERCENT) <sup>#1, #3</sup>	CPU usage rate. Percentage of CPU resources that could run a virtual machine on a physical CPU. [Units: %] Expression: "Used" field / "Clocks" field	HILO	AVG	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Insufficient % (INSUFFICIENT_PERCENT) <sup>#1</sup>	CPU insufficiency rate. Percentage of CPU resources that could not run a virtual machine on a physical CPU. [Units: %] Expression: "Insufficient" field / "Clocks" field	HILO	AVG	double	No	VMware: 0	Hyper-V KVM
Request % (REQUEST_PERCENT) <sup>#1</sup>	CPU request rate. Percentage of CPU resources required to run a virtual machine. (This is the total of the CPU allocation rate added to the CPU unallocation rate.) [Units: %] Expression: "Request" field / "Clocks" field	HILO	AVG	double	No	VMware: 0	Hyper-V KVM
Used Per Request (USED_PER_REQUEST)	% of allocatable CPU resources (= amount of CPU usage/amount of CPU requests). Percentage of the CPU resources required to run a virtual machine, that could run a virtual machine. [Units: %] Expression: "Used" field / "Request" field	HILO	AVG	double	No	VMware: 0	Hyper-V KVM
Insufficient Per Request (INSUFFICIENT_PER_REQUEST)	Rate of unallocated CPUs (= amount of CPU insufficiency/amount of CPU requests). Percentage of the CPU resources required to run a virtual machine,	HILO	AVG	double	No	VMware: 0	Hyper-V KVM

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Insufficient Per Request (INSUFFICIENT_PER_REQUEST)	that could not run a virtual machine. [Units: %] Expression: "Insufficient" field / "Request" field	HILO	AVG	double	No	VMware: 0	Hyper-V KVM
Affinity (AFFINITY)	Physical CPU that can be moved. The Affinity setting specifies that a physical CPU can be allocated to an individual virtual machine. (Ex: If a virtual machine can be allocated to physical CPU 1 and 2, the value of this field is 1, 2.)	COPY	FIXED	string (32)	No	Blank	Hyper-V
Share (SHARE)	CPU allocation ratio. A value used to request the CPU resources to be allocated to virtual machines. If two or more virtual machines require a large amount of CPU resources at the same time, the CPU resources are allocated according to this ratio. For Hyper-V, the root partition information cannot be obtained.	COPY	AVG	double	No	VMware: 0 Hyper-V: 0	KVM
Max (MAX)	Maximum value for CPU allocation. The maximum value for CPUs allocatable to a virtual machine. [Units: MHz] -1: No limit. For Hyper-V, the root partition information cannot be obtained.	COPY	ADD	double	No	VMware: 0 Hyper-V: 0 KVM: 0	--
Min (MIN)	Minimum value for CPU allocation. The minimum value for CPUs allocatable to a virtual machine. [Units: MHz] For Hyper-V, the root partition information cannot be obtained.	COPY	ADD	double	No	0	KVM
Expectation (EXPECTATION)	Balance value for CPU allocation. If two or more virtual machines require a large amount of resources at the same time, this value estimates what CPU resources can be expected to be available for the virtual machines. [Units: MHz]	HILO	ADD	double	No	VMware: 0	Hyper-V KVM
Max % (MAX_PERCENT)	Maximum % for CPU allocation. Percentage of CPU resources that is the maximum allocatable to a virtual machine. [Units: %]	HILO	AVG	double	No	VMware: 0 Hyper-V: 0	KVM

PFM - View name (PFM - Manager name)	Explanation	Summary	Grouping	Format	Delta	When not collected	Unsupported
Max % (MAX_PERCENT)	Expression: "Max" field / "Clocks" field For Hyper-V, the root partition information cannot be obtained.	HILO	AVG	double	No	VMware: 0 Hyper-V: 0	KVM
Min % (MIN_PERCENT)	Minimum % for CPU allocation. The minimum percentage of CPU resources that are allocatable to a virtual machine. [Units: %] Expression: "Min" field / "Clocks" field For Hyper-V, the root partition information cannot be obtained.	HILO	AVG	double	No	0	KVM
Expectation % (EXPECTATION_PERCENT)	Balance point rate for CPU allocation. Percentage of CPU resources that can be expected to be used for virtual machines. [Units: %] Expression: "Share" field / total of "Share" field	HILO	AVG	double	No	VMware: 0	Hyper-V KVM

#1

The value changes in accordance with the UseVcpuMax value set as instance information as follows:

N: Clock frequency of the physical CPU x number of cores

Y: Clock frequency of the CPU allocated to the virtual machine

#2

The value used in [ ± hh:mm ] varies depending on the time zone of the monitored host. For example, if the monitored virtual environment is operating according to JST, +09:00 is displayed. If the monitored virtual environment is operating according to UTC, Z is displayed.

#3

For Hyper-V or KVM, this field requires performance data to be collected at least twice.

# 6

## Messages

This chapter explains the format of PFM - RM for Virtual Machine messages, the output list, the Windows event log list, and the message list.

## 6.1 Message format

---

This section explains the format of the messages that are output by PFM - RM for Virtual Machine, and the format this manual uses to describe them.

### 6.1.1 Message output format

The following explains the format of the messages that are output by PFM - RM for Virtual Machine. A message consists of a message ID followed by message text. The format is shown below.

`KAVLnnnnn-Y message-text`

The parts of the message ID indicate the following:

**K**

Indicates a system identifier.

**AVL**

Indicates a PFM - RM message.

**nnnnn**

Message serial number. The message number for PFM - RM for Virtual Machine has the 20xxx format.

**Y**

Indicates a message type.

- **E**: Error  
Processing is interrupted.
- **W**: Warning  
Following the message output, processing continues.
- **I**: Information  
Indicates information for the user.
- **Q**: Response  
Prompts the user to respond.

The correspondence between message type and Windows Event Log type is shown below.

**-E**

- Level: Error
- Meaning: Error message

**-W**

- Level: Warning
- Meaning: Warning message

**-I**

- Level: Information
- Meaning: Additional information message

(Not output)

## 6.1.2 Message description format

This subsection explains the message description format used in this manual. The bolded area within message text means that the content to be displayed varies depending on the situation in which the message is issued. Messages are listed in numerical order by message ID. A description format example follows.

### Message ID

Message text

Message explanation

(S)

Indicates an action taken by the system.

(O)

Indicates the action to be taken by the operator when the message is displayed.



### Reference note

When notified by an operator, the system administrator must collect log information by referencing [7. Error Handling Procedures](#), and must perform an initial investigation.

During an initial investigation of the problem cause, refer to the OS log information (Windows Event Log) and the various types of log information that are output by PFM - RM for Virtual Machine. Use this log information to view the details for the time period in which the problem occurred, and then take action to solve the problem or avoid its recurrence. Also record the operating procedures that led to the problem. At the same time, check for reproducibility as much as possible.

The < > symbols within the message text indicate embedded characters. For example, if the host name is hostA and the message text shows `host=<host-name>`, `host= hostA` is output.



## 6.2 Message output destinations

This section lists the output destinations of the messages that are output by PFM - RM for Virtual Machine.

The following legend applies to the table below:

Legend:

stdout: Standard output

stderr: Standard error

Y: The message is output.

N: The message is not output.

Table 6–1: List of output destinations for PFM - RM for Virtual Machine messages

Message ID	Output destination					
	Windows Event Log	Common message log	stdout	stderr	JP1 system event <sup>#1</sup>	Agent event <sup>#2</sup>
KAVL20000-I	Y	Y	N	N	N	N
KAVL20001-E	Y	Y	N	N	N	N
KAVL20002-I	Y	Y	N	N	N	N
KAVL20004-E	Y	Y	N	N	N	N
KAVL20005-E	Y	Y	N	N	N	N
KAVL20006-E	Y	Y	N	N	Y	Y
KAVL20007-W	N	Y	N	N	Y	Y
KAVL20008-W	N	Y	N	N	Y	Y
KAVL20009-W	N	Y	N	N	Y	Y
KAVL20010-E	N	Y	N	N	N	N
KAVL20011-W	N	Y	N	N	Y	Y
KAVL20013-W	N	Y	N	N	Y	Y
KAVL20014-W	N	Y	N	N	Y	Y
KAVL20015-I	N	N	N	N	N	N
KAVL20016-W	N	Y	N	N	Y	Y
KAVL20017-W	N	Y	N	N	Y	Y
KAVL20018-W	N	Y	N	N	Y	Y
KAVL20201-W	N	Y	N	N	Y	Y
KAVL20202-W	N	Y	N	N	Y	Y
KAVL20203-W	N	Y	N	N	Y	Y
KAVL20204-W	N	Y	N	N	Y	Y
KAVL20205-W	N	Y	N	N	Y	Y
KAVL20300-W	N	Y	N	N	N	N
KAVL20301-W	N	Y	N	N	N	N

Message ID	Output destination					
	Windows Event Log	Common message log	stdout	stderr	JP1 system event <sup>#1</sup>	Agent event <sup>#2</sup>
KAVL20400-I	N	N	Y	N	N	N
KAVL20401-I	N	N	Y	N	N	N
KAVL20402-I	N	N	Y	N	N	N
KAVL20403-I	N	N	Y	N	N	N
KAVL20404-I	N	N	Y	N	N	N
KAVL20405-I	N	N	Y	N	N	N
KAVL20406-I	N	N	Y	N	N	N
KAVL20407-I	N	N	Y	N	N	N
KAVL20409-E	N	N	Y	N	N	N
KAVL20410-E	N	N	Y	N	N	N
KAVL20411-E	N	N	Y	N	N	N
KAVL20412-E	N	N	Y	N	N	N
KAVL20413-E	N	N	Y	N	N	N
KAVL20414-E	N	N	Y	N	N	N
KAVL20415-E	N	N	Y	N	N	N
KAVL20416-E	N	N	Y	N	N	N
KAVL20417-E	N	N	Y	N	N	N
KAVL20418-E	N	N	Y	N	N	N
KAVL20419-E	N	N	Y	N	N	N
KAVL20421-E	N	N	Y	N	N	N
KAVL20422-E	N	N	Y	N	N	N
KAVL20423-E	N	N	Y	N	N	N
KAVL20424-E	N	N	Y	N	N	N
KAVL20425-E	N	N	Y	N	N	N
KAVL20426-E	N	N	Y	N	N	N
KAVL20427-E	N	N	Y	N	N	N
KAVL20428-E	N	N	Y	N	N	N
KAVL20429-E	N	N	Y	N	N	N
KAVL20430-E	N	N	Y	N	N	N
KAVL20431-E	N	N	Y	N	N	N
KAVL20432-E	N	N	Y	N	N	N
KAVL20433-E	N	N	Y	N	N	N
KAVL20434-E	N	N	Y	N	N	N
KAVL20435-E	N	N	Y	N	N	N

Message ID	Output destination					
	Windows Event Log	Common message log	stdout	stderr	JP1 system event <sup>#1</sup>	Agent event <sup>#2</sup>
KAVL20436-E	N	N	Y	N	N	N
KAVL20437-E	N	N	Y	N	N	N
KAVL20438-E	N	N	Y	N	N	N
KAVL20439-E	N	N	Y	N	N	N
KAVL20440-E	N	N	Y	N	N	N
KAVL20441-E	N	N	Y	N	N	N
KAVL20443-E	N	N	Y	N	N	N
KAVL20444-E	N	N	Y	N	N	N
KAVL20445-I	N	N	Y	N	N	N
KAVL20446-I	N	N	Y	N	N	N
KAVL20447-I	N	N	Y	N	N	N
KAVL20448-E	N	N	Y	N	N	N
KAVL20449-I	N	N	Y	N	N	N
KAVL20450-I	N	N	Y	N	N	N
KAVL20451-E	N	N	Y	N	N	N
KAVL20452-I	N	N	Y	N	N	N
KAVL20453-I	N	N	Y	N	N	N
KAVL20462-E	N	N	Y	N	N	N
KAVL20463-E	N	N	Y	N	N	N
KAVL20464-E	N	N	Y	N	N	N
KAVL20465-E	N	N	Y	N	N	N
KAVL20466-E	N	N	Y	N	N	N
KAVL20467-E	N	N	Y	N	N	N
KAVL20468-E	N	N	Y	N	N	N
KAVL20471-E	N	N	Y	N	N	N
KAVL20472-E	N	N	Y	N	N	N
KAVL20473-E	N	N	Y	N	N	N
KAVL20474-E	N	N	Y	N	N	N
KAVL20475-E	N	N	Y	N	N	N
KAVL20477-I	N	N	Y	N	N	N
KAVL20478-I	N	N	Y	N	N	N
KAVL20479-E	N	N	Y	N	N	N
KAVL20480-W	N	N	Y	N	N	N
KAVL20481-E	N	N	Y	N	N	N

Message ID	Output destination					
	Windows Event Log	Common message log	stdout	stderr	JP1 system event <sup>#1</sup>	Agent event <sup>#2</sup>
KAVL20482-E	N	N	Y	N	N	N
KAVL20483-E	N	N	Y	N	N	N
KAVL20484-I	N	N	Y	N	N	N
KAVL20485-E	N	N	Y	N	N	N
KAVL20486-I	N	N	Y	N	N	N
KAVL20487-I	N	N	Y	N	N	N
KAVL20488-E	N	N	Y	N	N	N
KAVL20505-E	Y	Y	N	N	N	N
KAVL20513-W	N	Y	N	N	N	N
KAVL20516-W	N	Y	N	N	N	N
KAVL20517-W	N	Y	N	N	N	N
KAVL20521-I	N	Y	N	N	N	N
KAVL20524-W	N	Y	N	N	N	N
KAVL20526-W	N	Y	N	N	N	N

#1

A *JP1 system event* is an event for notifying JP1/Integrated Management about a change in the agent's status. For details about JP1 system events, see the chapter that explains operation monitoring via linkage to the integrated management product JP1/Integrated Management in the *Job Management Partner 1/Performance Management User's Guide*.

Note that when a message is issued as a JP1 system event, only the first 255 bytes of the message text are output. Beginning with the 256th character, the text is not output.

The table below shows the prerequisite programs for issuing JP1 system events.

**Table 6–2: Prerequisite programs for issuing JP1 system events**

Host type	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 Virtual Machine	10-00 or later
	PFM - Manager or PFM - Base	09-00 or later
	JP1/Base	08-50 or later

#2

An *agent event* is an event for notifying PFM - Manager about a change in the agent's status. For details about agent events, see the chapter that explains event display in the *Job Management Partner 1/Performance Management User's Guide*.

The table below shows the prerequisite programs for issuing agent events.

Table 6–3: Prerequisite programs for issuing agent events

Host type	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 Virtual Machine	10-00 or later
	PFM - Manager or PFM - Base	09-00 or later

## 6.3 List of messages output to the Windows event log

---

This section lists the message information that is output by PFM - RM for Virtual Machine to the Windows Event Log.

The Windows Event Log is displayed in the Application Log in the Event Viewer window.

To open the Event Viewer window, from the **Start** menu in Windows, choose **Administrative Tools**, and then **Event Viewer**.

For an event that is output by PFM - RM for Virtual Machine, the identifier PFM-Virtual Machine is displayed under **Source** in the Event Viewer window.

The table below lists the message information that is output by PFM - RM for Virtual Machine to the Windows Event Log.

Table 6–4: List of Windows Event Log output message information

Message ID	Windows Event Log	
	Event ID	Type
KAVL20000-I	20000	Information
KAVL20001-E	20001	Error
KAVL20002-I	20002	Information
KAVL20004-E	20004	Error
KAVL20005-E	20005	Error
KAVL20006-E	20006	Error
KAVL20505-E	20505	Error

## 6.4 Messages

---

This section explains the messages that are output by PFM - RM for Virtual Machine and the action to be taken by the user. The list of PFM - RM for Virtual Machine messages follows.

### KAVL20000-I

Remote Monitor Collector has stopped. (host=<*host-name*>, service=<*service-ID*>)

The Remote Monitor Collector service terminated normally.

(S)

Terminates processing of the Remote Monitor Collector service.

### KAVL20001-E

Remote Monitor Collector failed to start.

The Remote Monitor Collector service failed to start.

(S)

Terminates processing of the Remote Monitor Collector service.

(O)

Check the previous message that was output to the common message log, and take the action indicated in that message.

### KAVL20002-I

Remote Monitor Collector started. (host=<*host-name*>, service=<*service-ID*>)

Startup of the Remote Monitor Collector service is complete.

(S)

Starts the performance data collection process of the Remote Monitor Collector service.

### KAVL20004-E

An attempt to read the service startup information file has failed.

During startup processing of the Remote Monitor Collector service, the service startup initialization file could not be loaded.

(S)

Terminates processing of the Remote Monitor Collector service.

(O)

If this message is output repeatedly, delete the instance environment and then re-create the instance. If the cause cannot be determined, collect maintenance data and contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

## KAVL20005-E

Remote Monitor Collector will now stop because an error occurred.

The Remote Monitor Collector service is about to stop because an error has occurred.

(S)

Terminates processing of the Remote Monitor Collector service.

(O)

Check the previous message that was output to the common message log, and take the action indicated in that message. If the cause cannot be determined, collect maintenance data and contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

## KAVL20006-E

Memory allocation failed.

Memory allocation failed.

(S)

Terminates processing of the Remote Monitor Collector service.

(O)

Increase the amount of free memory.

## KAVL20007-W

Memory allocation failed. (RecordType=<record-type>)

Memory allocation failed. If UNKNOWN is output in *record-type*, this means that memory allocation failed for multiple record IDs.

(S)

Continues processing of the Remote Monitor Collector service.

(O)

Increase the amount of free memory.

## KAVL20008-W

An attempt to collect the record failed. (Instance=<instance-name>, Target=<monitoring-target-name>, RecordType=<record-type>)

The record indicated by *record-type* could not be collected.

(S)

Continues processing of the Remote Monitor Collector service.

(O)

Collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.



## KAVL20009-W

An invalid value or a value outside the range was specified for the property of the Remote Monitor Collector service. (Instance=<instance-name>, Target=<monitoring-target-name>, property=<property-name>, value=<range-value>)

An invalid value or a value outside the range was specified for a property of the Remote Monitor Collector service.

(S)

Invalidates the specified value and continues processing of the Remote Monitor Collector service. The item value remains unchanged.

(O)

Check whether the value that is specified is acceptable. If not, specify an appropriate value.

## KAVL20010-E

An error occurred in the function. (function=<function-name>, en=<error-code>, arg1=<argument-1>, arg2=<argument-2>, arg3=<argument-3>)

An error occurred during execution of the function indicated by *function-name*.

(S)

Terminates processing of the Remote Monitor Collector service.

(O)

Collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

## KAVL20011-W

The collector process failed to start.

A collection process failed to start.

(S)

Continues processing of the Remote Monitor Collector service.

(O)

Collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

## KAVL20013-W

A performance data file is invalid. (Instance=<instance-name>, Target=<monitoring-target-name>)

The content of a performance data storage file is invalid.

(S)

Continues processing of the Remote Monitor Collector service.

(O)

Collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

## KAVL20014-W

A collector process was forcefully terminated because performance data collection did not end in the specified period of time. (Instance=<instance-name>, Target=<monitoring-target-name>)

A collection process was forcibly terminated because performance data collection did not end within the specified period of time.

(S)

Continues processing of the Remote Monitor Collector service.

(O)

Check the following items:

- Whether the monitoring-target host has started
- Whether the connection settings on the virtualization system side are correct
- Whether the PFM - RM host and the virtualization system are in a temporary high load state
- Whether the following settings (specified during setup of the monitoring target) are correct

If the monitoring target uses VMware:

- Whether the host name (specified for Target Host and VM\_Host) can resolve to an IP address
- Whether a certificate has been installed (if Security = 1)
- Whether the Port value is correct
- Whether the UserID and Password values are correct
- Set Security = 1, and if the default certificate of VMware is used, confirm whether the Update Root Certificate functions affect the operation. For details, see [2.5.1 For VMware](#).

If the monitoring target uses Hyper-V:

- Whether the host name (specified for Target Host and VM\_Host) can resolve to an IP address
- Whether the WMI service has started on the monitoring-target host
- Whether the WMI connection setup procedure has been performed correctly
- Whether the UserID, Password, and Domain values are correct

If the monitoring target uses KVM:

- Whether the host name (specified for Target Host and VM\_Host) can resolve to an IP address
- Whether the SSH server is started on the monitoring-target host
- Whether the SSH connection setup procedure has been performed correctly
- Whether the Port value is correct
- Whether the UserID and Private\_Key\_File values are correct

If the cause cannot be determined, collect maintenance data and contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

## KAVL20015-I

The records were successfully saved onto the Store database. (Instance=<instance-name>, RecordType=<record-type>, count=<record-count>)

The process of saving the record(s) indicated by *record-type* in the Store database is complete.

(S)

Continues processing of the Remote Monitor Collector service.

## KAVL20016-W

The initialization of interprocess communication failed. (Instance=<instance-name>)

Initialization of communications between the Remote Monitor Collector service and a collection process failed.

(S)

Continues processing of the Remote Monitor Collector service.

(O)

Opening of or writing to a work file may have failed. Check to make sure that there is no disk space shortage.

If disk space is not a problem, collect maintenance data and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

## KAVL20017-W

An error occurred during collection of the record. (Instance=<instance-name>, Target=<monitoring-target-name>)

An error occurred during collection of the record.

(S)

Continues processing of the Remote Monitor Collector service.

(O)

Collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

## KAVL20018-W

Account authentication failed. (Instance=<instance-name>)

Account authentication failed.

(S)

Continues processing of the Remote Monitor Collector service.

(O)

Check whether the following items that were specified during setup of the instance environment are correct:

- HostUserID
- HostPassword

- HostDomain

## KAVL20201-W

The system could not connect to the monitored virtual environment. (Instance=<instance-name>, Target=<monitoring-target-name>, datetime=<date-time>, message=<message>)

The system could not connect to the monitored virtual environment.

(S)

Continues processing of the Remote Monitor Collector service.

(O)

Check the following items:

- Whether the monitoring-target host has started
- Whether the connection settings on the virtualization system side are correct
- Whether the PFM - RM host and the virtualization system are in a temporary high load state
- (If there is a firewall between PFM - RM for Virtual Machine and the monitoring-target host) Whether the ports used for communication are properly set in the firewall
- Whether the following settings (specified during setup of the monitoring target) are correct

If the monitoring target uses VMware:

- Whether the host name (specified for Target Host and VM\_Host) can resolve to an IP address
- Whether a certificate has been installed (if Security = 1)
- Whether the Port value is correct
- Whether the UserID and Password values are correct

If the monitoring target uses Hyper-V:

- Whether the host name (specified for Target Host and VM\_Host) can resolve to an IP address
- Whether the WMI service has started on the monitoring-target host
- Whether the WMI connection setup procedure has been performed correctly
- Whether the UserID, Password, and Domain values are correct

If the monitoring target uses KVM:

- Whether the host name (specified for Target Host and VM\_Host) can resolve to an IP address
- Whether the SSH server is started on the monitoring-target host
- Whether the SSH connection setup procedure has been performed correctly
- Whether the Port value is correct
- Whether the UserID and Private\_Key\_File values are correct

If the cause cannot be determined, collect maintenance data and contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/ Performance Management User's Guide*.

## KAVL20202-W

An attempt to authenticate the monitored virtual environment has failed. (Instance=<instance-name>, Target=<monitoring-target-name>, datetime=<date-time>, message=<message>)

The monitored virtual environment could not be authenticated.

(S)

Continues processing of the Remote Monitor Collector service.

(O)

Make sure that the host of the virtual environment is active. Furthermore, make sure that the following items, which were specified during setup of the monitoring-target, are correct:

- UserID
- Password

#### KAVL20203-W

Initialization of the collector process log file failed. (Instance=<instance-name>, Target=<monitoring-target-name>, datetime=<date-time>, message=<message>)

Initialization of a collection process log failed.

(S)

Continues processing of the Remote Monitor Collector service.

(O)

Opening of or writing to a work file may have failed. Check to make sure there is no disk space shortage.

If disk space is not a problem, collect maintenance data and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

#### KAVL20204-W

Initialization of the collector process failed. (Instance=<instance-name>, Target=<monitoring-target-name>, datetime=<date-time>, message=<message>)

Initialization of a collection process failed.

(S)

Continues processing of the Remote Monitor Collector service.

(O)

Collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

#### KAVL20205-W

A certificate is not installed or a certificate is not correct. (Instance=<instance-name>, Target=<monitoring-target-name>, datetime=<date-time>, message=<message>)

No certificate is installed or an incorrect certificate is installed.

(S)

Continues processing of the Remote Monitor Collector service.

(O)

Install a CA-signed certificate.

If the problem is not resolved even after a CA-signed certificate is installed, check the following items in the installed certificate:

- Effective period
- Issuing destination (whether it is the same as the host name)
- Validity of the certificate (has verification been completed successfully?)

If there is a problem with the certificate, re-create a certificate and then re-install it. For details about how to create a certificate, see the VMware documentation.

If the default certificate of VMware is used for operation, ignore this message.

For details about a certificate, see [2.5.1 For VMware](#).

## KAVL20300-W

It failed to occur JP1 system event or Agent event.

A JP1 system event or agent event could not be issued.

(S)

Continues processing of the Remote Monitor Collector service.

(O)

Collect maintenance data and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

## KAVL20301-W

It failed to issue JP1 system event or Agent event, because Memory is insufficient.

A JP1 system event or agent event could not be issued.

(S)

Continues processing of the Remote Monitor Collector.

(O)

Increase the amount of free memory.

## KAVL20400-I

The instance was successfully transitioned. (<PFM-Agent-for-Virtual-Machine-instance-name>-><PFM-RM-for-Virtual-Machine-instance-name> / <PFM-RM-for-Virtual-Machine-target-name>)

Migration terminated normally.

(S)

Terminates migration.

## KAVL20401-I

If you are changing location of the performance data, JP1 Event and PFM service automatic restart in the source environment, please review the target environment.

Migration terminated normally. If the performance data storage location, JP1 event, and PFM service automatic restart settings have been changed from the default settings in the migration source environment, review these settings in the destination environment.

(S)

Terminates migration.

#### KAVL20402-I

If you set the some targets to one instance, please review the value of 'Collection Interval'.

If you set multiple monitoring targets for one instance, review the value of the `Collection Interval` property.

(S)

Terminates migration.

#### KAVL20403-I

Start the migration process.

Migration started.

(S)

Performs migration.

#### KAVL20404-I

Be calculating of the size of post-migration Store database (*<PFM-Agent-for-Virtual-Machine-instance-name>-><PFM-RM-for-Virtual-Machine-instance-name>*)

The command is calculating the size that the Store database will have after migration.

(S)

The command is calculating the size that the Store database will be after migration.

#### KAVL20405-I

You can do the migration because the specified instance is a new one.

Migration is possible because the specified PFM - RM for Virtual Machine instance is a new instance.

(S)

Stops calculating the size that the Store database will be after migration.

#### KAVL20406-I

Finished to calculate size of the Store database. You can do the migration because Store database capacity after migration is less than maximum migration capacity.

Calculation of the size that the Store database will be after migration finished. Migration is possible because the calculated size does not exceed the upper limit.

(S)

Terminates calculating the size of post-migration Store database.

#### KAVL20407-I

Finished to calculate size of the Store database. You cannot do the migration because Store database capacity after migration is more than maximum migration capacity. As destination, please specify a new instance or another instance with spare Store database.

Calculation of the size of that the Store database will be after migration finished. Migration is impossible because the calculated size exceeds the upper limit. Specify a new instance as the migration destination, or another instance whose Store database has sufficient free space.

(S)

Terminates calculating the size of post-migration Store database.

(O)

Specify a new instance as the migration destination, or another instance whose Store database has sufficient free space.

#### KAVL20409-E

The migration operation failed, because the error occurred.

Migration failed due to an error.

(S)

Stops command execution.

(O)

Check the error details, and then re-execute the command.

#### KAVL20410-E

Specified arguments are incorrect.

Invalid arguments are specified.

(S)

Stops command execution.

(O)

Review the format of the command line, and then re-execute the command.

#### KAVL20411-E

The instance name specified by the `-rminst` option is incorrect.

The PFM - RM for Virtual Machine instance name specified by the `-rminst` option is incorrect.

(S)

Stops command execution.



(O)

Make sure that, for the `-rminst` option, you specify a PFM - RM for Virtual Machine instance name that is 1 through 32 bytes long and consists of single-byte alphanumeric characters.

#### KAVL20412-E

The target name specified by the `-target` option is incorrect.

The PFM - RM for Virtual Machine target name specified by the `-target` option is incorrect.

(S)

Stops command execution.

(O)

Make sure that, for the `-target` option, you specify a PFM - RM for Virtual Machine target name that is 1 through 32 bytes long and consists of single-byte alphanumeric characters and/or hyphens (-). You cannot specify a string that begins with a hyphen (-) or the string `ALL`.

#### KAVL20413-E

The logical hostname specified by the `-aolhost` option is incorrect.

The PFM - Agent for Virtual Machine logical host name specified by the `-aolhost` option is incorrect.

(S)

Stops command execution.

(O)

Make sure that, for the `-aolhost` option, you specify a PFM - Agent for Virtual Machine logical host name that is 1 through 32 bytes long and consists of single-byte alphanumeric characters without spaces or periods (.). You cannot specify the string `localhost`, an IP address, or a host name that begins with a hyphen (-).

#### KAVL20414-E

The logical hostname specified by the `-rmlhost` option is incorrect.

The PFM - RM for Virtual Machine logical host name specified by the `-rmlhost` option is incorrect.

(S)

Stops command execution.

(O)

Make sure that, for the `-rmlhost` option, you specify a PFM - RM for Virtual Machine logical host name that is 1 through 32 bytes long and consists of single-byte alphanumeric characters without spaces or periods (.). You cannot specify the string `localhost`, an IP address, or a host name that begins with a hyphen (-).

#### KAVL20415-E

You do not have permission to execute the command.

You do not have permission to execute the migration command.

(S)

Stops command execution.

(O)

Execute the command as a member of the Administrators group.

#### KAVL20416-E

The specified PFM - Agent for Virtual Machine service is running.

The service of the specified PFM - Agent for Virtual Machine instance is running.

(S)

Stops command execution.

(O)

Stop the service of the migration-source PFM - Agent for Virtual Machine instance.

#### KAVL20417-E

PFM - Agent for Virtual Machine service or PFM - RM for Virtual Machine service is not installed or is not set up.

The PFM - Agent for Virtual Machine service or the PFM - RM for Virtual Machine service has not been installed or set up.

(S)

Stops command execution.

(O)

Make sure that the PFM - Agent for Virtual Machine service or the PFM - RM for Virtual Machine service has been installed and set up.

#### KAVL20418-E

The PFM - Manager environment is invalid.

The PFM - Manager environment is invalid.

(S)

Stops command execution.

(O)

Collect the information about PFM - Manager, and then contact the system administrator or the support service.

#### KAVL20419-E

Specified logical hostname is not set up. (lhost=<logical-host-name>)

The specified logical host has not been set up.

(S)

Stops command execution.

(O)

The logical host name specified by the `-aolhost` or `-rmlhost` option is incorrect. Alternatively, the specified logical host has not been set up. If the `-rmlhost` option is omitted, the logical host name specified by the `-`

`aolhost` option is used. When you re-execute the command, make sure that you specify a correct logical host name.

#### KAVL20421-E

An attempt to notify to Remote Monitor service was failed. (inst=<instance-name>)

An attempt to notify the Remote Monitor service that a monitoring target was created failed. It might take time for the changes to be applied to the Remote Monitor service.

(S)

Stops command execution.

(O)

Confirm that the changes have been applied by checking the properties of the Remote Monitor service of the relevant instance from PFM - Web Console.

#### KAVL20422-E

The number of monitoring targets had already reached the maximum limit. (inst=<instance-name>)

The number of monitoring targets that have been set in the instance has already reached the maximum.

(S)

Stops command execution.

(O)

Delete unnecessary monitoring targets from the instance or specify another instance as the migration destination. Then, re-execute the command.

#### KAVL20423-E

Memory is insufficient.

Memory could not be secured because available memory was insufficient.

(S)

Stops command execution.

(O)

Terminate any unnecessary applications or increase the amount of memory.

#### KAVL20424-E

The disk capacity is insufficient.

File access failed because the amount of free disk space was insufficient.

(S)

Stops command execution.

(O)

Delete unnecessary files or increase the disk capacity.

## KAVL20425-E

An attempt to access the file failed. (file=<file-name>)

An attempt to access the specified file failed.

(S)

Stops command execution.

(O)

Remove the cause of the error, and then re-execute the command. Possible causes are as follows:

- Memory is insufficient.
- Disk space is insufficient.
- Permission to access files or directories is insufficient.
- A conflict occurred when an attempt was made to access a file (for example, a database file).
- Files such as database files are corrupted.

If this error occurs again after the cause of the error is removed, collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

## KAVL20426-E

An internal command cannot be executed. (<command-line>)

A command internally called by the migration command could not be executed. There are problems with the system environment.

(S)

Stops command execution.

(O)

Make sure that the executable file of the command indicated by *command-line* exists and that you have permission to execute the command. Report the string indicated by *command-line* to the system administrator or the support service.

## KAVL20427-E

An attempt to register a Windows service failed.

An unexpected error occurred while a Windows service was being registered. This error might occur if there are inconsistencies with the status of that service or if there are not sufficient resources.

(S)

Stops command execution.

(O)

Restart the system, and then re-execute the command. If the same error occurs again, the system might be corrupted. Collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

## KAVL20428-E

The specified instance of PFM - Agent for Virtual Machine does not exist. (<instance-name>)

The specified PFM - Agent for Virtual Machine instance does not exist.

- (S) Stops command execution.
- (O) Review the name of the PFM - Agent for Virtual Machine instance, and then re-execute the command.

## KAVL20429-E

The specified instance of PFM - RM for Virtual Machine does not exist. (<instance-name>)

The specified PFM - RM for Virtual Machine instance does not exist.

- (S) Stops command execution.
- (O) Review the name of the PFM - RM for Virtual Machine instance, and then re-execute the command. If you want to create a new PFM - RM for Virtual Machine instance, do not specify the `-targetadd` option.

## KAVL20430-E

An instance of PFM - RM for Virtual Machine with the specified name already exists. (<instance-name>)

The specified PFM - RM for Virtual Machine instance already exists.

- (S) Stops command execution.
- (O) Review the name of the PFM - RM for Virtual Machine instance, and then re-execute the command. If you want to perform migration to an existing PFM - RM for Virtual Machine instance, specify the `-targetadd` option.

## KAVL20431-E

The instance of PFM - Agent for Virtual Machine and PFM - RM for Virtual Machine specified are different. (<VM\_Type>)

Different values are specified for the `VM_Type` properties of the specified instances of PFM - Agent for Virtual Machine and PFM - RM for Virtual Machine.

- (S) Stops command execution.
- (O) Make sure that you specify migration sources and destination instances whose `VM_Type` properties are set to the same value. Alternatively, create a new instance without specifying the `-targetadd` option.

## KAVL20432-E

The `-targethost` option is omitted and the value of 'VM\_Host' of the instance specified by the `-aoinst` option is not 1 to 32 bytes of character, or alphanumeric and '-'.  
The `-targethost` option is not specified. In addition, the `VM_Host` value of the instance specified by the `-aoinst` option is not 1 through 32 bytes long or includes characters that are not single-byte alphanumeric characters or hyphens (-).

(S)

Stops command execution.

(O)

Specify a new monitoring target name for the `-targethost` option.

## KAVL20433-E

The specified target of PFM - RM for Virtual Machine does not exist. (instance=<instance-name>, target=<monitoring-target-name>)

The specified monitoring target of the PFM - RM for Virtual Machine instance does not exist.

(S)

Stops command execution.

(O)

Check the names of the monitoring targets set up in the PFM - RM for Virtual Machine instance, and then re-execute the command.

## KAVL20434-E

A target of PFM - RM for Virtual Machine with the specified name already exists. (instance=<instance-name>, target=<monitoring-target-name>)

The specified monitoring target of the PFM - RM for Virtual Machine instance already exists.

(S)

Stops command execution.

(O)

Re-execute the command by specifying the name of a monitoring target that has not been set up in the PFM - RM for Virtual Machine instance.

## KAVL20435-E

The specified PFM - Agent for Virtual Machine is not 09-01 or later versions. (version=<version>)

The version of the PFM - Agent for Virtual Machine instance is not 09-01 or later.

(S)

Stops command execution.

(O)

Update PFM - Agent for Virtual Machine to version 09-01 or later.

## KAVL20436-E

The Store version of the specified instance is not 2.0 or the data model version is not 4.0.

The Store version of the specified PFM - Agent for Virtual Machine instance environment is not 2.0. Alternatively, the data model version is not 4.0.

(S)

Stops command execution.

(O)

Convert the PFM - Agent for Virtual Machine instance environment. The data model version of any instance environment created with PFM - Agent for Virtual Machine 09-00 or earlier is 3.0. To convert the data model version to 4.0, use the `jpctool db dmconvert` command. To update the Store database version to 2.0, use the `jpccconf db vrset` command.

## KAVL20437-E

The capacity of the specified Store database of the PFM - RM for Virtual Machine exceeds the maximum migration capacity.

The size that the Store database of the specified PFM - RM for Virtual Machine instance will be after migration exceeds the maximum size.

(S)

Stops command execution.

(O)

Specify a new instance as the migration destination, or another instance whose Store database has sufficient free space.

## KAVL20438-E

The specified backup path of PFM - Agent for Virtual Machine does not exist.

The specified backup directory of the Store database of PFM - Agent for Virtual Machine does not exist.

(S)

Stops command execution.

(O)

Make sure that you specify the correct path for the backup directory of the Store database of PFM - Agent for Virtual Machine.

## KAVL20439-E

The specified backup path of PFM - RM for Virtual Machine does not exist.

The specified backup directory of the Store database of PFM - RM for Virtual Machine does not exist.

(S)

Stops command execution.

(O)

Make sure that you specify the correct path for the backup directory of the Store database of PFM - RM for Virtual Machine.

#### KAVL20440-E

The specified backup path of PFM - RM for Virtual Machine is not empty.

The specified backup directory of the Store database of PFM - RM for Virtual Machine is not empty.

(S)

Stops command execution.

(O)

Make sure that you specify an empty directory as the backup directory for the Store database of PFM - RM for Virtual Machine.

#### KAVL20441-E

The analysis of the migration files failed, because the error occurred.

The files to be migrated could not be analyzed due to an error.

(S)

Stops command execution.

(O)

Remove the cause of the error, and then re-execute the command. Possible causes of the file migration error are as follows:

- Memory is insufficient.
- The migration destination does not have sufficient free disk space.
- Permission to access files or directories is insufficient.
- Contention occurred when an attempt was made to access a file (for example, a database file).
- Files such as database files are corrupted.

If this error occurs again after the cause of the error is removed, collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

#### KAVL20443-E

An unexpected exception has occurred. (rc=<maintenance-code>)

An unexpected error occurred.

(S)

Stops command execution.

(O)

Wait a while, and then re-execute the migration command. If this error occurs again, collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.



## KAVL20444-E

The host name specified by the `-targethost` option is incorrect.

The monitoring-target host name specified by the `-targethost` option is incorrect.

(S)

Stops command execution.

(O)

Make sure that the name of the PFM - RM for Virtual Machine monitoring target you specify for the `-targethost` option is 1 through 32 bytes long and consists of only single-byte alphanumeric characters and/or hyphens (-). You cannot specify a name that begins with a hyphen (-).

## KAVL20445-I

If the instance is created in the destination, please delete the instance.

Migration failed due to an error. If the instance was created at the migration destination, delete the instance.

(S)

Stops command execution.

(O)

If the PFM - RM for Virtual Machine instance was created, delete it.

## KAVL20446-I

Start to restore the Store database of the specified PFM - RM for Virtual Machine.

Restoration of the Store database of the specified PFM - RM for Virtual Machine instance started.

(S)

Restores the Store database of the specified PFM - RM for Virtual Machine instance.

## KAVL20447-I

End to restore the Store database of the specified PFM - RM for Virtual Machine.

Restoration of the Store database of the specified PFM - RM for Virtual Machine instance was completed.

## KAVL20448-E

Failed to restore the Store database of the specified PFM - RM for Virtual Machine.

Restoration of the Store database of the specified PFM - RM for Virtual Machine instance failed.

(S)

Stops command execution.

(O)

The Store database of PFM - RM for Virtual Machine might be in an incorrect state. Collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

#### KAVL20449-I

Start to backup the Store database of the specified PFM - RM for Virtual Machine.

Backup processing of the Store database of the specified PFM - RM for Virtual Machine instance started.

(S)

Backs up the Store database of the specified PFM - RM for Virtual Machine instance.

#### KAVL20450-I

End to backup the Store database of the specified PFM - RM for Virtual Machine.

Backup processing of the Store database of the specified PFM - RM for Virtual Machine instance was completed.

#### KAVL20451-E

Failed to backup the Store database of the specified PFM - RM for Virtual Machine.

Backup processing of the Store database of the specified PFM - RM for Virtual Machine instance failed.

(S)

Stops command execution.

(O)

Remove the cause of the error, and then re-execute the command. Possible causes of the Store database backup error are as follows:

- The migration destination does not have sufficient free disk space.
- Permission to access files or directories is insufficient.
- A conflict occurred when an attempt was made to access a file (for example, a database file).
- Files such as database files are corrupted.

If this error occurs again after removing the cause, collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

#### KAVL20452-I

Start to migrate the Store database.

Migration of a Store database started.

(S)

Migrates a Store database.

#### KAVL20453-I

End to migrate the Store database.

Migration of a Store database was completed.

## KAVL20462-E

The specified dictionary file was not found. (dict=<dictionary-file-name>)

The specified dictionary file does not exist.

(S)

Stops command execution.

(O)

There are problems with the PFM - Agent for Virtual Machine or PFM - RM for Virtual Machine environment. Collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

## KAVL20463-E

The specified dictionary file is invalid. (dict=<dictionary-file-name>, line=<line-number>, errmsg=<message>)

The contents of the dictionary file are incorrect.

(S)

Stops command execution.

(O)

There are problems with the PFM - Agent for Virtual Machine or PFM - RM for Virtual Machine environment. Collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

## KAVL20464-E

A datatype cannot be converted. (dict=<dictionary-file-name>, line=<line-number>)

The data type cannot be converted.

(S)

Stops command execution.

(O)

There are problems with the PFM - Agent for Virtual Machine or PFM - RM for Virtual Machine environment. Collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

## KAVL20465-E

A rule cannot be converted. (dict=<dictionary-file-name>, line=<line-number>)

Consolidation rules cannot be converted.

(S)

Stops command execution.

(O)

There are problems with the PFM - Agent for Virtual Machine or PFM - RM for Virtual Machine environment. Collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

#### KAVL20466-E

The specified directory was not found. (dir=<directory>)

The specified directory does not exist.

(S)

Stops command execution.

(O)

Check whether the indicated directory can be created. If it cannot be created, remove the cause of the obstacle, and then re-execute the command.

#### KAVL20467-E

The specified Store database is invalid. (db=<database>, errmsg=<message>)

The contents of the Store database are incorrect.

(S)

Stops command execution.

(O)

There are problems with the PFM - Agent for Virtual Machine or PFM - RM for Virtual Machine environment. Collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

#### KAVL20468-E

The Store database directory cannot be specified as the work directory. (wkdir=<work-directory>, stdir=<database-directory>)

The Store database directory cannot be specified as the work directory.

(S)

Stops command execution.

(O)

Check whether the work directory is a symbolic link to the database directory. If so, delete the symbolic link, and then re-execute the command.

#### KAVL20471-E

An attempt to access a file failed. (file=<file-name>, api=<API-name>, en=<error-code>, errmsg=<message>)

An attempt to access the specified file failed.

(S)

Stops command execution.

(O)

Check whether you can access the file. If you cannot, remove the cause of the obstacle, and then re-execute the command.

#### KAVL20472-E

An attempt to access a directory failed. (dir=<directory-name>, api=<API-name>, en=<error-code>, errmsg=<message>)

An attempt to access the specified directory failed.

(S)

Stops command execution.

(O)

Check whether you can access the directory. If you cannot, remove the cause of the obstacle, and then re-execute the command.

#### KAVL20473-E

The system environment is incorrect. (rc=<maintenance-code>)

There are problems with the system environment. Necessary system files have been deleted or access permission settings have been changed.

(S)

Stops command execution.

(O)

If this message is output during command execution, see the message that was output before this one in the common message log. If no message was output before this one, re-install Performance Management.

#### KAVL20474-E

An attempt to access a file or directory (<path>) failed.

When a general access operation (for example, a create, delete, read, or write operation) was attempted, an error that was not due to insufficient free disk space occurred. Possible causes of this error are as follows:

- Access permission was insufficient.
- The file system was unmounted.
- The specified path was a directory path rather than a file path.

(S)

Stops command execution.

(O)

Check the status of the file at the indicated path, remove the cause of the error, and then re-execute the command. If the specified path is a directory path, files with names that begin with PFM might remain after occurrence of the error. Change the access permission settings, and then delete the files with names that begin with PFM.

## KAVL20475-E

Conversion of a database has failed. (db=<database-name>)

Processing stops because the target database could not be converted.

(S)

Stops command execution.

(O)

Remove the cause of the error, and then re-execute the command. Possible causes of the file migration error are as follows:

- Memory is insufficient.
- The migration destination does not have sufficient free disk space.
- Permission to access files or directories is insufficient.
- Contention occurred when an attempt was made to access a file (for example, a database file).
- Files such as database files are corrupted.
- An attempt was made to create a monitoring target with the same name as the monitoring target deleted by using the `jpcconf target unsetup` command.

See the notes on using the migration command in the chapter on the migration command in the manual.

If this error occurs again after the cause of the error is removed, collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

## KAVL20477-I

Start to check the store DB size. (Number of files=<file-number>)

Size checking starts.

(S)

Checks the size that the database will have.

## KAVL20478-I

End to check the store DB size.

Size checking was completed.

(S)

Size checking was completed.

## KAVL20479-E

An error has occurred during the migration of the Store database.

An error occurred during migration of the Store database.

(S)

Stops command execution.

(O)

Remove the cause of the error, and then re-execute the command. Possible causes of the file migration error are as follows:

- Memory is insufficient.
- The migration destination does not have sufficient free disk space.
- Permission to access files or directories is insufficient.
- Contention occurred when an attempt was made to access a file (for example, a database file).
- Files such as database files are corrupted.
- An attempt was made to create a monitoring target with the same name as the monitoring target deleted by using the `jpcconf target unsetup` command.

See the notes on using the migration command in the chapter on the migration command in the manual.

If this error occurs again after the cause of the error is removed, collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

#### KAVL20480-W

The migration process was cancelled.

Migration was canceled by a user.

(S)

Stops command execution.

(O)

Delete the instance or monitoring target that was created at the destination, and then re-execute the command.

#### KAVL20481-E

The instance name specified by the `-aoinst` option is incorrect.

The PFM - Agent for Virtual Machine instance name specified by the `-aoinst` option is incorrect.

(S)

Stops command execution.

(O)

Make sure that the PFM - Agent for Virtual Machine instance name specified by the `-aoinst` option is 1 through 32 bytes long and consists of only single-byte alphanumeric characters.

#### KAVL20482-E

The backup path specified by the `-aobkpath` option is incorrect.

The backup directory name specified by the `-aobkpath` option is incorrect.

(S)

Stops command execution.

(O)

Make sure that the backup directory name specified by the `-aobkpath` option is 1 through 214 bytes long.

#### KAVL20483-E

The backup path specified by the `-rmbkpath` option is incorrect.

The backup directory name specified by the `-rmbkpath` option is incorrect.

- (S) Stops command execution.
- (O) Make sure that the backup directory name specified by the `-rmbkpath` option is 1 through 214 bytes long.

#### KAVL20484-I

If the target is created in the destination, please delete the target.

Migration failed due to an error. If the monitoring target has been created at the destination, delete the monitoring target.

- (S) Stops command execution.
- (O) If the monitoring target has been created at the migration-destination PFM - RM for Virtual Machine instance, delete the monitoring target.

#### KAVL20485-E

The specified PFM - RM for Virtual Machine service is running.

The service of the specified PFM - RM for Virtual Machine instance is running.

- (S) Stops command execution.
- (O) Stop the service of the migration-destination PFM - RM for Virtual Machine instance.

#### KAVL20486-I

Start to analyze the migration files. (Number of files=<*file-number*>)

Analysis of the files to be migrated started.

- (S) Analyzes the files to be migrated.

#### KAVL20487-I

End to analyze the migration files.

Analysis of the files to be migrated ended.

- (S) Analysis of the files to be migrated ended.



## KAVL20488-E

An error has occurred in the internal command. (cmd=<command-line>, rc=<maintenance-code>)

A command internally called from the migration command could not be executed. Check whether the called command is currently being executed by another command.

- (S)  
Stops command execution.
- (O)  
When you execute the migration command, make sure that other commands, such as `jpcconf`, `jpcctrl`, `jpcspm`, `jpcstart`, and `jpcstop`, are not running.

## KAVL20505-E

An attempt to read the target information file has failed. (Target=<monitoring-target-name>)

The monitoring target information file could not be loaded while the Remote Monitor Collector service was being started.

- (S)  
Stops the Remote Monitor Collector service.
- (O)  
Delete the relevant monitoring target, and then re-create it.

## KAVL20513-W

The collector process failed to start.

The collection process could not be started.

- (S)  
Continues processing of the Remote Monitor Collector service.
- (O)  
Collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

## KAVL20516-W

Performance data was not saved to the Store database because it is the same as previous performance data. (Instance=<instance-name>, Target=<monitoring-target-name>, RecordType=<record-type>)

Performance data was not saved in the Store database because the data was the same as the previously collected data.

- (S)  
Continues processing of the Remote Monitor Collector service.
- (O)  
Make sure that the collection process execution interval does not exceed the record collection interval.

If this problem frequently occurs when the collection process execution interval does not exceed the record collection interval, increase the value of the record collection interval or decrease the number of hosts monitored in the instance environment.

## KAVL20517-W

The record build failed because there is no performance data. (Instance=<instance-name>, Target=<monitoring-target-name>)

An attempt to build records failed because there was no performance data.

(S)

Continues processing of the Remote Monitor Collector service.

(O)

This alert might occur immediately after startup because no performance data has been collected.

If this alert continues to occur after the first collection finishes, check the following items:

- Whether the monitoring-target host has started
- Whether the following settings (specified during setup of the monitoring target) are correct
  - If the monitoring target uses VMware:
    - Whether the host name (specified for `Target Host` and `VM_Host`) can resolve to an IP address
    - Whether a certificate has been installed (if `Security = 1`)
    - Whether the `Port` value is correct
    - Whether the `UserID` and `Password` values are correct
  - If the monitoring target uses Hyper-V:
    - Whether the host name (specified for `Target Host` and `VM_Host`) can resolve to an IP address
    - Whether the WMI service is started on the monitoring-target host
    - Whether the WMI connection setup procedure has been performed correctly
    - Whether the `UserID`, `Password`, and `Domain` values are correct
  - If the monitoring target uses KVM:
    - Whether the host name (specified for `Target Host` and `VM_Host`) can resolve to an IP address
    - Whether the SSH server is started on the monitoring-target host
    - Whether the SSH connection setup procedure has been performed correctly
    - Whether the `Port` value is correct
    - Whether the `UserID` and `Private_Key_File` values are correct
    - Whether the `SSH_Client` value specified during instance setup is correct

If the cause cannot be determined, collect maintenance data and contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

## KAVL20521-I

A collector process will restart because the system detected that it stopped. (Instance=<instance-name>)

The collection process will be restarted because its stoppage was detected.

(S)

Continues processing of the Remote Monitor Collector service.

## KAVL20524-W

There are no SSH client execution modules. (Instance=<*instance-name*>)

The value set as the SSH client execution module (`SSH_Client`) is incorrect. Make sure that you specify a correct value when monitoring KVM.

(S)

Continues processing of the Remote Monitor Collector service.

(O)

Check whether the value of the following property that was set during setup of the instance environment is correct:

- `SSH_Client`

## KAVL20526-W

There are no private keys. (Instance=<*instance-name*>, Target=<*monitoring-target-name*>)

The private key file to be used for SSH public key encryption is not correctly set (`Private_Key_File`). Make sure that you specify a correct value when monitoring KVM.

(S)

Continues processing of the Remote Monitor Collector service.

(O)

Check whether the value of the following property that was set during setup of the monitoring target is correct:

- `Private_Key_File`

# 7

## Error Handling Procedures

This chapter explains the actions that you can take when problems occur during Performance Management operations, especially with regard to PFM - RM for Virtual Machine. For details about troubleshooting for the entire Performance Management system, see the chapter that explains error detection in the *Job Management Partner 1/Performance Management User's Guide*.

## 7.1 Error handling procedures

---

This section describes the procedure to follow when a problem occurs in Performance Management.

### *Checking the event*

Check the following details:

- What was happening when the problem occurred
- Message content (if a message has been output)
- Log information, such as the common message log

For the cause of each message and the action to take, see [6. Messages](#). For details about the log information that is output by Performance Management, see [7.3 Log information](#).

### *Collecting data*

You need to collect data to investigate the cause of the problem. See [7.4 Data collected when a problem occurs](#) and [7.5 How to collect data](#), and collect the necessary data.

### *Investigating the problem*

Based on the collected data, investigate the cause of the problem, and identify the area where the problem occurred and its scope.

## 7.2 Troubleshooting

This section describes troubleshooting related to the use of Performance Management. If a problem occurs when you are using Performance Management, first check whether any of the events explained in this section has occurred.

The table below describes the main problems that can occur in Performance Management.

Table 7–1: Troubleshooting

Classification	Problem description	Described in
Setup and service startup	<ul style="list-style-type: none"><li>• A Performance Management program service does not start.</li><li>• It takes a long time for a service to start after a service startup request is issued.</li><li>• When another program begins a service after a Performance Management program service has stopped, communication cannot be established correctly.</li><li>• After an <code>The disk capacity is insufficient</code> message is output, the Master Store service or Remote Monitor Store service stops.</li><li>• The Remote Monitor Collector service of PFM - RM does not start.</li></ul>	<a href="#">7.2.1</a>
Command execution	<ul style="list-style-type: none"><li>• When the <code>jpctool service list</code> command is executed, a service name that is not active is output.</li><li>• When the <code>jpctool db dump</code> command is executed, data that is not from the specified Store database is output.</li></ul>	<a href="#">7.2.2</a>
Report definition	<ul style="list-style-type: none"><li>• Some time bands are not displayed in the historical report.</li></ul>	<a href="#">7.2.3</a>
Alarm definition	<ul style="list-style-type: none"><li>• A program defined in the action definition is not running correctly.</li><li>• No alarm event is displayed.</li></ul>	<a href="#">7.2.4</a>
Performance data collection and management	<ul style="list-style-type: none"><li>• Even though a short data retention period was set, the size of the PFM - RM for Virtual Machine Store database is not reduced.</li><li>• The message <code>Illegal data was detected in the Store database</code> is output to the common message log.</li><li>• Even though PFM - RM for Virtual Machine has started, no performance data is being collected.</li><li>• There is a large time difference between Record Time and Sampling Time.</li></ul>	<a href="#">7.2.5</a>

### 7.2.1 Setup and service startup

This subsection describes troubleshooting related to setup and service startup.

#### (1) If a Performance Management program service does not start

Factors that may be preventing the service of a Performance Management program from starting and the actions that can be taken are described below.

- PFM - Manager is stopped

When PFM - Manager and PFM - RM for Virtual Machine are on the same host, the PFM - RM for Virtual Machine service cannot start if PFM - Manager is stopped. Check whether PFM - Manager is active. If it is not, start it. For details about how to start a service, see the chapter that explains startup and termination of Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

- The same port number is set for multiple services of a Performance Management program

If the same port number is set for multiple services of a Performance Management program, a Performance Management service cannot start. By default, port numbers are automatically assigned, and thus will not be duplicated. If you set fixed port numbers for Performance Management program services during setup of Performance Management, check the port number settings. If the same port number is set up for multiple services of a Performance Management program, specify different port numbers. For details about how to set port numbers, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

- The storage folder settings in the Store database are invalid

If any of the folders listed below is located in an inaccessible or nonexistent folder, a Remote Monitor Store service cannot start. Check the folder name and attribute settings, and correct them if they are invalid.

- Store database storage folder
- Store database backup folder
- Store database partial backup folder
- Store database export folder
- Store database import folder

Additionally, if any of these folders is set up for multiple Remote Monitor Store services, a Remote Monitor Store service cannot start. Check the folder settings and correct them if they are invalid.

- The machine's host name was changed using a method other than the specified method

For details about how to change a machine's host name, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*. If the host name was changed using a method other than the specified method, the services of a Performance Management program may not start in some cases.

- An error occurred in the service control manager

When the `jpcspm start` command is executed in Windows, the message `An error occurred in the Windows service control manager` may be output and service startup may fail. If this occurs, re-execute the `jpcspm start` command. If the same event occurs frequently, change the interval and count for retrying service startup during execution of the `jpcspm start` command by editing the `jpccomm.ini` file. For details about how to change the retry interval and count, see the chapter that explains startup and termination of Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

## (2) It takes a long time for a service to start after a service startup request is issued

After you have executed the `jpcspm start` command or have started a service using the **Services** icon, it may take a while before the service actually starts. If any of the factors listed below is delaying startup, the service startup time will be shorter when the service is started the second time and thereafter.

- When a service is being started in stand-alone mode, it may take a while to start.
- If you have not set the system to automatically stop services when the system stops, and if you restart the system and try to start a service, the Store database index is rebuilt in some cases. In such cases, service startup may take a while.
- If you start a service after having added a new instance, the Store database index is created during the initial startup only. Consequently, service startup may take a while.
- If the Store service could not perform normal termination processing because of a power outage or other such problem, the Store database index is rebuilt during a restart, with the consequence that it might take a while for a Store service to start.

### **(3) When another program begins a service after a Performance Management program service has stopped, communication cannot be established correctly**

Immediately after a Performance Management program service has stopped, if another program starts a service using the port number that was being used by the first service, communication may not be established correctly. To prevent this from happening, take one of the following actions:

- Assign fixed port numbers to the services of Performance Management programs  
Assign fixed port numbers to the services of Performance Management programs. For details about how to assign port numbers, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.
- Set the TCP\_TIMEWAIT value  
Set the connection wait time of the TCP\_TIMEWAIT value to the default. The default is as follows:
  - In Windows Server 2003, Windows Server 2008 and Windows Server 2012: 2 minutes

### **(4) After an "The disk capacity is insufficient" message is output, the Master Store service or Remote Monitor Store service stops**

If the disk being used by the Store database has insufficient free space, the operation of storing data in the Store database stops. In this case, after the message `The disk capacity is insufficient` is output, the Master Store service or Remote Monitor Store service stops.

If this message is displayed, take either of the following actions:

- Secure sufficient disk capacity  
Estimate the amount of disk space the Store database is using, and then switch the Store database storage destination to a disk that has sufficient capacity. For details about how to estimate the amount of disk space the Store database is using, see [A. Estimating System Requirements](#). For details about how to switch the Store database storage destination, see [2.4.1 Changing the performance data storage destination](#).
- Change the data retention condition for the Store database  
Change the data retention condition for the Store database and adjust the upper limit for the Store database data volume. For details about how to change the data retention condition for the Store database, see the chapter that explains management of operation monitoring data in the *Job Management Partner 1/Performance Management User's Guide*.

If a Master Store service or Remote Monitor Store service still does not start even after these actions have been taken, a non-recoverable logical conflict has occurred in the Store database. In this case, restore the Store database from a backup, and then start the Master Store service or Remote Monitor Store service. If there is no backup data that can be used, initialize the Store database, and then start the Master Store service or Remote Monitor Store service. To initialize the Store database, delete all of the following files from the Store database storage folder:

- Files with the `.DB` extension
- Files with the `.IDX` extension

For details about the Store database storage folder, see [2.4.1 Changing the performance data storage destination](#).



## (5) The Remote Monitor Collector service of PFM - RM does not start

On a PFM - RM host whose OS is Windows, if the Remote Monitor Collector service cannot start at startup of PFM - RM, either of the following messages might be output to the Windows event log when Windows restarts:

- The *service-name* service stops at the startup.
- The *service-name* service is hung up at the start.

This problem is due to a timeout of the Windows service control manager. It is likely to occur when busy communications cause PFM - Manager to become non-responsive. This problem occurs if all of the following conditions exist:

- JP1/PFM - Manager is busy with communication.  
This condition applies when, for example, many PFM - RM instances are being started.
- The startup type of each PFM - RM service is set to **Automatic** in the **Services** Windows applet.
- The OS is restarted.

To avoid this problem, perform either of the following operations:

- If you want the service to start when the OS is restarted, make sure that the service is started by the `jpccspm start` command rather than from the Windows service control manager.
- Reduce the time required to start PFM - RM by specifying the setting described below on the PFM - RM host.  
When the PFM - RM service is started, if the service cannot connect to PFM - Manager, the service tries to reconnect. This setting can reduce the reconnection time. In this case, the PFM - RM service is often started in standalone mode. To reduce the time required to start PFM - RM, open the `jpccomm.ini` startup initialization file. Then, under `Agent Collector x Section#` and `Agent Store x Section#`, change the setting of the `NS Init Retry Count` label from `NS Init Retry Count =2` to `NS Init Retry Count =1`.

#  
The variable *x* is replaced with a PFM - RM product ID. For details about product IDs, see [B. List of Identifiers](#). If multiple instances of PFM - RM are installed on the same host, specify the setting of the `NS Init Retry Count` label for the product ID of each instance.

The location of the `jpccomm.ini` startup initialization file is as follows.

If the PFM - RM host is a physical host:

`installation-folder\jpccomm.ini`

If the PFM - RM host is a logical host:

`environment-directory#\jp1pc\jpccomm.ini`

#  
This is a directory on the shared disk that was specified when the logical host was created.

## 7.2.2 Command execution

This subsection describes troubleshooting related to Performance Management command execution.

### (1) When the `jpctool service list` command is executed, a service name that is not active is output

The following describes possible factors and the actions that can be taken.

- A Performance Management program was uninstalled without deleting its service information  
Even after a Performance Management program is uninstalled, the service information of the Performance Management program still remains in the database. Delete the service information of the Performance Management program by executing the `jpctool service delete` command. For details about how to delete service information, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.
- The machine host name was changed without deleting the service information of a Performance Management program  
If you change the host name of a machine without deleting the service information of a Performance Management program, the service information of the service ID to which the previous host name is attached remains in the database that is being managed by the Master Manager service. Delete the service information of the Performance Management program by executing the `jpctool service delete` command. For details about how to delete service information and change the host name, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

## **(2) When the `jpctool db dump` command is executed, data that is not from the specified Store database is output**

If you specify the same export file name for the same Master Store service or Remote Monitor Store service and then execute the `jpctool db dump` command multiple times, the output result from the earlier execution is overwritten with the output result from the later execution. Therefore, when you are executing the `jpctool db dump` command multiple times for the same Master Store service or Remote Monitor Store service, specify export files having different names. For details about how to export the Store database, see the chapter that explains management of operation monitoring data in the *Job Management Partner 1/Performance Management User's Guide*.

### **7.2.3 Report definition**

Factors related to report definition problems in Performance Management are described below.

#### **(1) Some time bands are not displayed in the historical report**

If you change the current time of the computer on which PFM - RM for Virtual Machine is installed to a time in the future, historical information is not saved for the period from the time at which the change was made until the new time that was specified.

### **7.2.4 Alarm definitions**

This subsection explains troubleshooting related to Performance Management alarm definitions.

#### **(1) A program defined in the action definitions does not run correctly**

Possible factors and the actions that can be taken are described below.

- PFM - Manager or the Action Handler service of the action execution host has not been started  
If PFM - Manager or the Action Handler service of the action execution host is stopped, no action can be executed. Before executing an action, start PFM - Manager or the Action Handler service of the action execution host.

## (2) No alarm event is displayed

Possible factors and the actions that can be taken are described below.

- PFM - Manager is not active  
If PFM - Manager is stopped, alarm events from PFM - RM for Virtual Machine cannot be issued correctly. To monitor alarm events, you must first start PFM - Manager.

## 7.2.5 Performance data collection and management

This subsection describes troubleshooting related to performance data collection and management procedures of Performance Management.

### (1) Even though a short data retention period was set, the size of the PFM - RM for Virtual Machine Store database is not reduced

If the file capacity of the Store database has already reached its limit, setting a shorter data retention period will not reduce the file size. In this case, set a shorter retention period first, back up the Store database, and then restore it.

For details about how to set the data retention period, see the chapter that explains 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 that explains backup and restoration in the *Job Management Partner 1/Performance Management User's Guide*.

### (2) The message "Illegal data was detected in the Store database" is output to the common message log

It is suspected that an unexpected service stoppage or machine shutdown generated invalid data in the Store database. Take the following actions:

- If the Store database has been backed up, restore it.
- If the Store database has not been backed up, first stop Remote Monitor Store, delete the corresponding database files (\*.DB and \*.IDX files), and then restart the service.

### (3) No performance data is collected even when PFM - RM for Virtual Machine is started

The items to check and the actions to be taken are described below for each monitored virtual environment.

#### (a) For VMware

- If you are monitoring information of a virtual machine running on VMware, check the following items:
  - Make sure that VMware Tools is running on the monitored virtual machine.
  - If you change the time on a physical server on which VMware is running, performance data may not be collected in some cases. In such cases, start the mgmt-vmware service.
- If the Status field value of a PD record shows ERROR, take an action based on the value in the Reason field. The table below shows the actions to be taken.

Table 7–2: Reason field value and actions to be taken

Reason field value	Explanation	Action
Connection failed	An attempt to connect to the target virtual environment failed.	<ul style="list-style-type: none"> <li>• Check whether the host of the virtual environment is active.</li> <li>• Check whether the following items, which were specified during setup of the instance environment, are valid: # <ul style="list-style-type: none"> <li>- VM_Type</li> </ul> </li> <li>• Check whether the following items, which were specified during setup of the monitoring target, are valid: # <ul style="list-style-type: none"> <li>- Target_Host</li> <li>- VM_Host</li> <li>- Security</li> <li>- Port</li> <li>- UserID</li> <li>- Password</li> </ul> </li> <li>• Check whether the host name (Target_Host or VM_Host), which was specified during setup of the monitoring target, can be resolved.</li> <li>• If SSL is used for communication with the virtual environment (1 is set in Security), check whether a certificate has been embedded. For PFM - RM for Virtual Machine, a certificate must be installed for each monitoring target.</li> <li>• Check whether the communication method that was specified for Security during setup of the monitoring target is permitted on the virtual environment side. For example, if Security=1 (to use SSL) is specified, HTTPS connection must be permitted on the virtual environment side. In some cases, the virtual environment side can be set to redirect HTTP connection to HTTPS connection (httpsWithRedirect for VMware). If redirecting is enabled, HTTPS connection will succeed, but HTTP connection will fail. Therefore, specify Security=1 (use SSL) in the monitoring target settings to use an HTTPS connection. For details about how to set a communication method for a virtual environment, see the VMware documentation.</li> <li>• Make sure that the user ID that was specified for UserID during setup of the monitoring target has at least read-only permissions for VMware roles. For details about how to check permissions, see the VMware documentation.</li> </ul>
Authorization failed	Authorization failed at the target virtual environment.	<ul style="list-style-type: none"> <li>• Check whether the host of the virtual environment is active.</li> <li>• Check whether the following items, which were specified during setup of the monitoring target, are valid: # <ul style="list-style-type: none"> <li>- UserID</li> <li>- Password</li> <li>- Domain</li> </ul> </li> </ul>
Timeout	Performance data collection did not end within the specified time.	<ul style="list-style-type: none"> <li>• Check whether the host of the virtual environment is active.</li> <li>• Check whether the following items, which were specified during setup of the instance environment, are valid: # <ul style="list-style-type: none"> <li>- VM_Type</li> </ul> </li> <li>• Check whether the following items, which were specified during setup of the monitoring target, are valid: # <ul style="list-style-type: none"> <li>- Target_Host</li> <li>- VM_Host</li> <li>- Security</li> <li>- Port</li> <li>- UserID</li> <li>- Password</li> </ul> </li> </ul>

Reason field value	Explanation	Action
Timeout	Performance data collection did not end within the specified time.	<ul style="list-style-type: none"> <li>• Check whether the host name (<code>Target Host</code> or <code>VM_Host</code>) which was specified during setup of the monitoring target, can be resolved.</li> <li>• If SSL is being used for communication with the virtual environment (1 is set in <i>Security</i>), make sure that a certificate has been embedded. For PFM - RM for Virtual Machine, a certificate must be installed for each monitoring target.</li> <li>• If the cause cannot be determined, collect maintenance data and contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the <i>Job Management Partner 1/ Performance Management User's Guide</i>.</li> </ul>
Collection Error	A collection error occurred.	<ul style="list-style-type: none"> <li>• Check whether the following items that were specified during setup of the instance environment are correct: # <ul style="list-style-type: none"> <li>- <code>HostUserID</code></li> <li>- <code>HostPassword</code></li> <li>- <code>HostDomain</code></li> </ul> </li> <li>• If the cause cannot be determined, collect maintenance data and contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the <i>Job Management Partner 1/ Performance Management User's Guide</i>.</li> </ul>

#  
To check an item that has been set, execute the `jpccconf` command. Alternatively, on PFM - Web Console, view the Remote Monitor Configuration properties from the Remote Monitor Collector service of PFM - RM for Virtual Machine.

- In all other cases, collect maintenance data and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/ Performance Management User's Guide*.
- If the OS of the monitoring-target host is Windows, take action by checking the application event log.

## (b) For Hyper-V

- If the Status field value of a PD record shows `ERROR`, take action as indicated by the value in the Reason field. The table below shows the actions to be taken.

Table 7–3: Reason field value and actions to be taken

Reason field value	Explanation	Action
Connection failed	Attempt to connect to the target virtual environment failed.	<ul style="list-style-type: none"> <li>• Check whether the host of the virtual environment is active.</li> <li>• Check whether the following items that were specified during setup of the instance environment are correct: # <ul style="list-style-type: none"> <li>- <code>VM_Type</code></li> </ul> </li> <li>• Check whether the following items, which were specified during setup of the monitoring target, are valid: # <ul style="list-style-type: none"> <li>- <code>Target Host</code></li> <li>- <code>VM_Host</code></li> <li>- <code>UserID</code></li> <li>- <code>Password</code></li> <li>- <code>Domain</code></li> </ul> </li> <li>• Check whether the host name (<code>Target Host</code> or <code>VM_Host</code>) that was specified during setup of the monitoring target can be resolved.</li> <li>• Check whether the WMI connection has been set up correctly. For PFM - RM for Virtual Machine, WMI connection settings must be specified for each monitoring target.</li> </ul>

Reason field value	Explanation	Action
Authorization failed	Authorization failed at the target virtual environment.	<ul style="list-style-type: none"> <li>• Check whether the host of the virtual environment is active.</li> <li>• Check whether the following items that were specified during setup of the monitoring target are correct: # <ul style="list-style-type: none"> <li>- UserID</li> <li>- Password</li> <li>- Domain</li> </ul> </li> </ul>
Timeout	Performance data collection did not end within the specified time.	<ul style="list-style-type: none"> <li>• Check whether the host of the virtual environment is active.</li> <li>• Check whether the following items that were specified during setup of the instance environment are correct: # <ul style="list-style-type: none"> <li>- VM_Type</li> </ul> </li> <li>• Check whether the following items, which were specified during setup of the monitoring target, are valid: # <ul style="list-style-type: none"> <li>- Target Host</li> <li>- VM_Host</li> <li>- UserID</li> <li>- Password</li> <li>- Domain</li> </ul> </li> <li>• Check whether the host name (Target Host or VM_Host) that was specified during setup of the monitoring target can be resolved.</li> <li>• Check whether the WMI connection has been set up correctly. For PFM - RM for Virtual Machine, WMI connection settings must be specified for each monitoring target.</li> <li>• If the cause cannot be determined, collect maintenance data and contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the <i>Job Management Partner 1/ Performance Management User's Guide</i>.</li> </ul>
Collection Error	A collection error occurred.	<ul style="list-style-type: none"> <li>• Check whether the following items that were specified during setup of the instance environment are correct: # <ul style="list-style-type: none"> <li>- HostUserID</li> <li>- HostPassword</li> <li>- HostDomain</li> </ul> </li> <li>• If the cause cannot be determined, collect maintenance data and contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the <i>Job Management Partner 1/ Performance Management User's Guide</i>.</li> </ul>

#  
Use the `jpccconf` command to check what has been set for an item. Alternatively, the Remote Monitor Configuration properties from the Remote Monitor Collector service of PFM - RM for Virtual Machine can be viewed on PFM - Web Console.

- In all other cases, collect maintenance data and then contact the system administrator. For details about how to collect maintenance data, see the chapter that explains troubleshooting in the *Job Management Partner 1/ Performance Management User's Guide*.
- If the OS of the monitoring-target host is Windows, check the application event log.

### (c) For KVM

- If the `Status` field of the PD record stores the value `ERROR`, take action according to the value of the `Reason` field. The following table lists the values of the `Reason` field and describes the action to be taken for each value.

Table 7–4: Action to be taken according to the value of the Reason field

Reason field value	Explanation	Action
Connection failed	Connection to the destination virtual environment failed.	<p>Check whether the host in the virtual environment has started.</p> <p>Make sure that the following settings specified during instance environment setup are correct.:#</p> <ul style="list-style-type: none"> <li>- VM_Type</li> <li>- SSH_Client</li> </ul> <p>Make sure that the following settings specified during monitoring target setup are correct.:#</p> <ul style="list-style-type: none"> <li>- Target Host</li> <li>- VM_Host</li> <li>- Port</li> <li>- UserID</li> <li>- Private_Key_File</li> </ul> <p>Make sure that the host name specified (for Target Host and VM_Host) during monitoring target setup can resolve to an IP address.</p> <p>Make sure that the SSH connection settings are specified. For PFM - RM for Virtual Machine, these settings must be specified for each monitoring target.</p>
Authorization failed	Authentication failed in the destination virtual environment.	<p>Check whether the host in the virtual environment has started.</p> <p>Make sure that the following settings specified during instance environment setup are correct.:#</p> <ul style="list-style-type: none"> <li>- HostUserID</li> <li>- HostPassword</li> <li>- HostDomain</li> </ul> <p>Make sure that the following settings specified during monitoring target setup are correct.:#</p> <ul style="list-style-type: none"> <li>- UserID</li> </ul>
Timeout	Performance data collection did not end within the specified length of time.	<p>Check whether the host in the virtual environment has started.</p> <p>Make sure that the following settings specified during instance environment setup are correct.:#</p> <ul style="list-style-type: none"> <li>- VM_Type</li> <li>- HostUserID</li> <li>- HostPassword</li> <li>- HostDomain</li> </ul> <p>Make sure that the following settings specified during monitoring target setup are correct.:#</p> <ul style="list-style-type: none"> <li>- Target Host</li> <li>- VM_Host</li> <li>- Port</li> <li>- UserID</li> <li>- Private_Key_File</li> </ul> <p>Make sure that the host name specified (for Target Host and VM_Host) during monitoring target setup can resolve to an IP address.</p> <p>Make sure that the SSH connection settings are specified. For PFM - RM for Virtual Machine, these settings must be specified for each monitoring target.</p> <p>If the cause of the problem cannot be determined, collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter on troubleshooting in the <i>Job Management Partner 1/Performance Management User's Guide</i>.</p>
Collection Error	A collection error occurred.	<p>Make sure that the following settings specified during instance environment setup are correct.:#</p>

Reason field value	Explanation	Action
Collection Error	A collection error occurred.	<ul style="list-style-type: none"> <li>- HostUserID</li> <li>- HostPassword</li> <li>- HostDomain</li> </ul> <p>If the cause of the problem cannot be determined, collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter on troubleshooting in the <i>Job Management Partner 1/Performance Management User's Guide</i>.</p>

#

To check the settings that have been specified, execute the `jpccconf` command. You can also check them from PFM - Web Console by referencing the Remote Monitor Configuration properties of the Remote Monitor Collector service of PFM - RM for Virtual Machine.

- In any conditions other than the above condition, collect maintenance data, and then contact the system administrator. For details about how to collect maintenance data, see the chapter on troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.
- If the OS of the monitoring-target host is Windows, check the application event log.

## (4) There is a large time difference between Record Time and Sampling Time

Because Sampling Time is the time in the monitored virtual environment, a slight time deviation may occur in normal operations. If the time deviation is large enough to cause an operational problem, check the following items:

- Is the time set on the RM host different from that set in the monitored virtual environment?  
If they are different, they need to be synchronized. Before changing the time settings, carefully read the notes related to the OS of the RM host and the virtual environment software.
- If SSL is being used for communication with the virtual environment, has a certificate been embedded?  
If a certificate has not been embedded correctly, information collection may be delayed. See [2.5.1 For VMware](#), and correctly embed a certificate in the RM host. For details about how to embed a certificate in a monitored virtual environment, see the documentation for the virtual environment software.

## 7.2.6 Other problems

Check what was happening when the problem occurred. If a message was output, check its content. For details about the log information that is output by Performance Management, see [7.3 Log information](#).

If the problem cannot be solved even after you have taken the actions prescribed in [7.2.1 Setup and service startup](#) through [7.2.5 Performance data collection and management](#), or if other problems occur, collect data for the purpose of investigating the cause of the problems, and then contact the system administrator.

For details about the data that must be collected and how to collect it, see [7.4 Data collected when a problem occurs](#) and [7.5 How to collect data](#).



## 7.3 Log information

---

When a problem occurs in Performance Management, check the log information to determine which corrective action to take. The following five types of log information are output when Performance Management is operating:

- System log
- Common message log
- Operation status log
- Trace log
- Collected log

Each of these types of log information is explained below.

### 7.3.1 Log information types

#### (1) System log

The system log contains information that indicates the system status and reports problems. In Windows, this information is output to the event log file.

For details about the output format, see the chapter that explains log information in the manual *Job Management Partner 1/Performance Management Reference*.

*Note about operations in a logical host environment*

In addition to the system log of Performance Management, you need the cluster software's log in order to check the control of Performance Management by the cluster software.

#### (2) Common message log

The common message log contains information that indicates the system status and reports problems. This log contains more detailed information than the system log. For details about the name of the output destination file for the common message log and the file size, see [7.3.2 Log file and folder list](#). For details about the output format, see the chapter that explains log information in the manual *Job Management Partner 1/Performance Management Reference*.

*Note about operations in a logical host environment*

When Performance Management is running on a logical host, the common message log is output to a shared disk. Because log files located on the shared disk are inherited along with the system when a failover occurs, messages are recorded in the same log file. If you want to check a history of operations on Performance Management performed from the cluster software in addition to the Performance Management system log, the log of the cluster software is required.

#### (3) Operation status log

The operation status log contains the log information that is output by PFM - Web Console. For details about the name of the output destination file for the operation status log and the file size, see the chapter that explains error detection in the *Job Management Partner 1/Performance Management User's Guide*. For details about the output format, see the chapter that explains log information in the manual *Job Management Partner 1/Performance Management Reference*.

## (4) Trace log

The trace log is used to collect log information that can be used for investigating a problem's history, and for measuring the processing time each process uses.

The trace log is output to the log file that each service of the Performance Management program has.

### *Note about operations in a logical host environment*

When Performance Management is running on a logical host, the trace log is output to a shared disk. Because log files located on the shared disk are inherited along with the system when a failover occurs, messages are recorded in the same log file.

## (5) Collected logs

Collected logs contain log information about processes related to record collection, and are output by PFM - RM for Virtual Machine. Logs are collected for the purpose of obtaining detailed information about these processes when a problem occurs. For details about the output destination, see [7.3.2\(3\) Collected log](#).

## 7.3.2 Log file and folder list

This subsection explains the log information that is output by Performance Management programs. For details about the name of the output destination file for the operation status log and the file size, see the chapter that explains error detection in the *Job Management Partner 1/Performance Management User's Guide*.

### (1) Common message log

For the common message log, which is one of Performance Management's log information types, the following table lists the service name or control name of the program that outputs the log, the file name of the log, and the disk space used by the log.

Table 7–5: Common message log file name

Log information type	Output source	File name	Disk usage <sup>#1</sup> (kilobytes)
Common message log	Performance Management	<i>installation-folder</i> \log\jpclog{01 02} <sup>#2</sup>	2,048 (2)
		<i>installation-folder</i> \log\jpclogw{01 02} <sup>#2</sup>	2,048 (2)
Common message log (in logical host environment)	Performance Management running on logical host	<i>environment-folder</i> <sup>#3</sup> \jplpc\log\jpclog{01 02} <sup>#2</sup>	2,048 (2)
		<i>environment-folder</i> <sup>#3</sup> \jplpc\log\jpclogw{01 02} <sup>#2</sup>	2,048 (2)

#1

Numbers in parentheses indicate the maximum number of log files that are created for each service. For example, "2,048 (2)" means a maximum of two log files, each with a size of 2.048 kilobytes, can be created. In this case, the total disk usage is 4,096 kilobytes.

#2

The file name of the common message log has a suffix of either 01 or 02.

### *When the sequential file (jpclog) method is used*

Log information is first output to a log file with the 01 suffix. When the log file size reaches its upper limit, the log file name suffix is changed from 01 to 02 and a new log file with the 01 suffix is created. From this point on, log information is output to the log file with the 01 suffix. If a log file with the 02 suffix already exists, it is overwritten. The latest log is always output to the log file with the 01 suffix.

### *When the wrap-around file (jpclogw) method is used*

Log information is first output to a log file with the 01 suffix. When the log file size reaches its upper limit, a new log file with the 02 suffix is created. From this point on, log information is output to the log file with the 02 suffix. If a log file with the 02 suffix already exists, all of its data is deleted first and then logs are output to this log file, beginning at the first line. Thereafter, the log output destination is alternated.

For details about log file output methods, see the chapter that explains error detection in the *Job Management Partner 1/Performance Management User's Guide*.

#3

The environment folder is a folder that was specified on the shared disk when the logical host was created.

## **(2) Trace log**

Of the five types of log information that are output by Performance Management, the table below shows the service name or control name that outputs the trace log of PFM - RM for Virtual Machine, and the folder name at the destination where the log is saved.

**Table 7–6: Trace log storage folder name**

Log information type	Output source	Folder name
Trace log	Action Handler service	<i>installation-folder</i> \bin\action\log\
	Performance Management command	<i>installation-folder</i> \tools\log\
	Remote Monitor Collector service	<i>installation-folder</i> \agt8\agent\instance-name\log\
	Remote Monitor Store service	<i>installation-folder</i> \agt8\store\instance-name\log\
	Migration command	<i>installation-folder</i> \agt8\tools\log\
	Status Server service	<i>installation-folder</i> \bin\statsvr\log\
Trace log (in logical host environment)	Action Handler service	<i>environment-folder</i> #\jp1pc\bin\action\log\
	Performance Management command	<i>environment-folder</i> #\jp1pc\tools\log\
	Remote Monitor Collector service	<i>environment-folder</i> #\jp1pc\agt8\agent\instance-name\log\
	Remote Monitor Store service	<i>environment-folder</i> #\jp1pc\agt8\store\instance-name\log\

#

The environment folder is a folder that was specified on the shared disk when the logical host was created.

(3) Collected log

Of the five types of log information that are output by Performance Management, the table below shows log file names, disk usage, and the service name or control name that outputs the collected log of PFM - RM for Virtual Machine.

A collected log is created for each monitoring target.

Table 7–7: Collected log files

Log information type	Output source	Output destination	File name	Default disk usage <sup>#1</sup> (megabytes)
Regular log	PFM - RM for Virtual Machine	<i>installation-folder</i> \agt8\agent\instance-name\log\	<i>VM_Type_monitoring-target-name</i> {1 2 3 4 5 6 7 8}.log <sup>#2</sup>	128
Regular log (in logical host environment)	PFM - RM for Virtual Machine	<i>environment-folder</i> <sup>#3</sup> \jpc\pc\agt8\agent\instance-name\log\	<i>VM_Type_monitoring-target-name</i> {1 2 3 4 5 6 7 8}.log <sup>#2</sup>	128

#1

The maximum file size of the collected log can be checked or modified using the following procedures:

- Execute the `jpcconf inst setup` command.
- View the Remote Monitor Configuration property in the PFM - Web Console window.

For details about the procedure that uses the `jpcconf inst setup` command, see [2.4.2 Updating an instance environment](#).

#2

The collected log uses the wrap-around file method. This method adds data to the latest log, without deleting the existing log. When the file size of a log exceeds the specified size, a new file with the log file number incremented by one is created. When the maximum number of logs that can be generated is reached (fixed at 8), the first file is overwritten.

#3

The environment folder is a folder that was specified on the shared disk when the logical host was created.

## 7.4 Data collected when a problem occurs

If a problem cannot be solved even after you have taken the actions prescribed in [7.2 Troubleshooting](#), you need to collect data to investigate the cause of the problem, and then contact the system administrator. This section explains the data that needs to be collected when a problem occurs.

Performance Management provides a command for batch-collecting the necessary data. To collect PFM - RM for Virtual Machine data, use the `jpcras` command. Data that can be collected using the `jpcras` command is indicated in the tables below.

*Note:*

Data that can be collected using the `jpcras` command differs depending on the option specified for command execution. For details about the options that can be specified for the command and the types of data that can be collected, see the chapter that explains commands in the manual *Job Management Partner 1/Performance Management Reference*.

*Notes about operations in a logical host environment*

Note the following points when Performance Management is running on a logical host:

- When Performance Management is running on a logical host, the Performance Management logs are output to a shared disk. If the shared disk is online, you can use the `jpcras` command to batch-collect the logs from the shared disk.
- To investigate a problem that occurred during a failover, you need the data that was present before and after the failover. Therefore, you need data from both the active server and the standby server.
- To investigate Performance Management when it is running on a logical host, you need data from the cluster software. Because the operations of starting and stopping Performance Management are controlled by the cluster software in this case, you need to compare the behavior of the cluster software with that of Performance Management.

### 7.4.1 In Windows

#### (1) OS log information

The table below shows the types of OS log information that need to be collected.

Table 7–8: OS log information

Information type	Overview	Default file name	Collectable using the <code>jpcras</code> command?
System log	Windows event log	N/A	Y
	WMI log	<code>system-folder\system32\WBEM\Logs\* #</code>	Y
Process information	Process list	N/A	Y
System file	hosts file	<code>system-folder\system32\drivers\etc\hosts</code>	Y
	services file	<code>system-folder\system32\drivers\etc\services</code>	Y
OS information	System information	N/A	Y
	Network status	N/A	Y

Information type	Overview	Default file name	Collectable using the jpcras command?
OS information	Host name	N/A	Y
	Windows Firewall information	N/A	Y
Dump information (For Windows Server 2003)	Dr. Watson file	<i>system-drive</i> \Documents and Settings\All Users\Application Data\Microsoft\Dr Watson\drwtsn32.log# <i>system-drive</i> \Documents and Settings\All Users\Application Data\Microsoft\Dr Watson\user.dump#	Y
Dump information (For Windows Server 2008 and Windows Server 2012)	Log file for problem reports and solutions	<div><i>user-mode-process-dump-output-folder</i> <i>program-name.process-ID.dmp</i></div> Example: jpcagt8.exe.2420.dmp	N

Legend:

Y: Can be collected

N: Cannot be collected

N/A: Not applicable

#

If log files are set to be output to a different folder, collect data from the applicable folder.

## (2) Performance Management information

The following types of information related to Performance Management need to be collected. If a problem occurred with a network connection, you also need to collect files from the target machine. The table below shows the Performance Management information.

Table 7–9: Performance Management information

Information type	Overview	Default file name	Collectable using the jpcras command?
Common message log	Message log output by Performance Management (Sequential file method)	<i>installation-folder</i> \log\jpclog{01 02}#1	Y
	Message log output by Performance Management (Wrap-around file method)	<i>installation-folder</i> \log\jpclogw{01 02}#1	Y
Configuration information	Each configuration information file	N/A	Y
	jpc tool service list (jpcctrl list)	N/A	Y

Information type	Overview	Default file name	Collectable using the jpcras command?
Configuration information	command output result	N/A	Y
Version information	Product version	N/A	Y
	History information	N/A	Y
Database information	Remote Monitor Store service	*.DB and *.IDX files in the following folders: <i>installation-folder\agt8\store\instance-name\STPD</i> <i>installation-folder\agt8\store\instance-name\STPI</i>	Y
Trace log	Trace information of each Performance Management program service	N/A <sup>#2</sup>	Y
Collected log	Information when performance information was collected	<i>installation-folder\agt8\agent\instance-name\log\VM_Type_monitoring-target-name*.log</i>	Y
Work data	Work data when performance information was collected	<i>installation-folder\agt8\agent\instance-name\targets\monitoring-target-name\work\*</i> <i>installation-folder\agt8\agent\instance-name\targets\monitoring-target-name\data\*</i>	Y
Collector plug-in data	Data for each collector plug-in	<i>installation-folder\agt8\plugin\jpcagt5*.d\*</i> <i>installation-folder\agt8\plugin\jpcagt8*.d\*</i>	Y
Migration command data <sup>#3</sup>	Data about execution of the migration command	<i>installation-folder\agt8\tools\log\*</i>	Y
Installation log <sup>#4</sup>	Message log during installation	<i>system-folder\TEMP\HCDINST\*.LOG</i>	N

#### Legend:

Y: Can be collected

N: Cannot be collected

N/A: Not applicable

#1

For the log file output method, see the chapter that explains error detection in the *Job Management Partner 1/Performance Management User's Guide*.

#2

For the trace log storage folder, see [7.3.2\(2\) Trace log](#).

#3

For details about the data about execution of the migration command, see [G. Migration from PFM - Agent for Virtual Machine to PFM - Remote Monitor for Virtual Machine](#).

#4

Collect this information if installation fails.

### (3) Registry information

Collect registry information related to HNTRLib2. The table below shows the information to collect.

Table 7–10: HNTRLib2 information (in Windows)

Information type	Overview	Registry key name	Collectable using the jpcras command?
Configuration information	Each type of configuration information	HKEY_LOCAL_MACHINE\SOFTWARE\HITACHI\HNTRLIB2\HNTR1 (other than the x64 environment) HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432NODE\HITACHI\HNTRLIB2\HNTR1 (in the x64 environment)	Y

Legend:

Y: Can be collected

### (4) Operation content

You need the following types of information about the operation that was taking place when the problem occurred:

- Detailed operation content
- Time at which the problem occurred
- Machine configuration (including the version of each OS, host name, and configuration of PFM - Manager and PFM - RM for Virtual Machine)
- Whether the problem is reproducible
- If the user logged on from PFM - Web Console, the Performance Management user name used for the logon

### (5) Error information on the screen

Collect hard copies of the following:

- Operation window if an application error occurred
- Error message dialog box (including the description displayed when the **Details** button is clicked, if available)
- The Command Prompt window if the problem occurred during command execution

### (6) User dump (in Windows Server 2008 or Windows Server 2012)

In Windows Server 2008 or Windows Server 2012, if a Performance Management process stops due to an application error, obtain a user dump.

### (7) Collecting problem reports (in Windows Server 2008 or Windows Server 2012)

In Windows Server 2008 or Windows Server 2012, if a Performance Management process stops due to an application error, obtain a problem report.

### (8) Other information

In addition to the information described above, the following types of information are needed:



- Contents displayed for the **System** and **Application** items in Windows Event Viewer (For Windows Server 2003)
- Contents displayed for **System Information** under **System Tools** in **Accessories** (For Windows Server 2003)
- Argument specified for a command if the problem occurred during command execution

## 7.5 How to collect data

---

This section explains how to collect data when a problem occurs.

### 7.5.1 In Windows

#### (1) Collecting dump information (in Windows Server 2008 or Windows Server 2012)

To collect dump information in a Windows Server 2008 or a Windows Server 2012 environment:

1. Open Task Manager.
2. Select the **Processes** 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) Executing the data collection command

To collect data for troubleshooting, use the `jpcras` command. The procedure for executing the data collection command follows. The operations described here must be executed by an OS user who has Administrator permissions.

To execute the data collection command:

1. Log on to the host on which the service is installed whose data you want to collect.
2. At the command prompt, execute the following command to enable the command extension function of the command interpreter:

```
cmd /E:ON
```

3. Specify the data you want to collect and the storage folder, and then execute the `jpcras` command.  
In the following command specification example, all information that can be collected using the `jpcras` command is saved in the `c:\tmp\jpc\agt` folder:

```
jpcras c:\tmp\jpc\agt all all
```

When the `jpcras` command is executed, the `jpctool service list -id * -host *` command is internally executed in order to obtain a PFM service list and check the startup status. If a firewall is installed between the command execution host and the host of another Performance Management system, or if the system configuration is large, execution of the `jpctool service list -id * -host *` command may take a long time. In such a case, by setting the environment variable `JPC_COLCTRLNOHOST` to 1, you can suppress the processing of the `jpctool service list -id * -host *` command, thereby shortening the command execution time.

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

*Note on executing the command in a Windows Server 2008 or a Windows Server 2012 environment*

If the user account control functionality (UAC) is enabled in the operating system, 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) Executing the data collection command (in a logical host environment)

When Performance Management is running on a logical host, data is stored on a shared disk, and must therefore be collected from both the active server and the standby server.

To collect data for troubleshooting, use the `jpcras` command. The procedure for executing the data collection command follows. The operations described here must be executed by an OS user who has Administrator permissions.

To execute the data collection command in a logical host operation environment:

1. Bring the shared disk online.

The data of the logical host is stored on the shared disk. On the executing node, make sure that the shared disk is online and then collect the data.

2. On both the active server and standby server, specify the data you want to collect and the storage folder, and then execute the `jpcras` command.

In the following command specification example, all information that can be collected using the `jpcras` command is saved in the `c:\tmp\jpc\agt` folder:

```
jpcras c:\tmp\jpc\agt all all
```

If you execute the `jpcras` command without specifying the `lhost` argument, all Performance Management data is collected from the node's physical host and logical host. If a Performance Management instance is running in a logical host environment, log files on the shared disk are collected.

If you execute the `jpcras` command on a node at which the shared disk is offline, files on the shared disk cannot be collected, but the process terminates normally without causing an error.

*Note:*

Collect data from both the executing node and the standby node by executing the data collection command. To investigate what happened before and after a failover, you need data from both the active server and the standby server.

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

3. Collect cluster software data.

This data is required in order to determine whether the problem occurred in the cluster software or in Performance Management. Collect data that can be used to investigate start, stop, and other control requests issued by the cluster software to Performance Management, and the results.

### (4) Collecting a Windows event log

In the Windows Event Viewer window, collect the content of **System** and **Applications**.

## (5) Checking the operation content

Check the operational details having to do with the problem and record them. You need to check the following types of information:

- Detailed operation content
- Time at which the problem occurred
- Machine configuration (including the version of each OS, host name, and configuration of PFM - Manager and PFM - RM for Virtual Machine)
- Whether the problem is reproducible
- If the user logged on from PFM - Web Console, the Performance Management user name used for the logon

## (6) Collecting error information from windows

Obtain a hardcopy of the following information:

- The window operation when the application error occurred
- The error message dialog box

If there is detailed information, also make a hardcopy of that information.

- The Command Prompt window or the Administrator Console window, if the error occurred during command execution

To print the Command Prompt window or the Administrator Console window, specify the following settings for the Command Prompt Properties window:

- **Edit options** on the **Options** page  
Select **Quick Edit Mode**.
- **Layout** page  
For **Screen buffer size**, set **Height** to 500.

## (7) Collecting other information

Collect other necessary information.

- Content of **Accessories > System Tools > System Information**

## 7.6 Detecting problems within Performance Management

---

Using the health check function, Performance Management can detect errors that occur in Performance Management itself. The health check function monitors the operating status of the monitoring agent and the host on which the monitoring agent is running, and displays the monitoring result on PFM - Web Console as changes in the operating status of the monitoring agent.

Furthermore, using the PFM service automatic restart function, Performance Management can automatically restart a PFM service if it abnormally terminates due to a problem, and it can restart a PFM service at regular intervals.

To have the health check function monitor the operating status of the monitoring agent or to have the PFM service automatic restart function automatically restart a PFM service, you use the status management function, which checks the detailed status of Performance Management services. Therefore, the monitoring agent to be monitored must be a version that is compatible with the status management function, and this function must be enabled. To monitor the operating status of a host, there are no prerequisite conditions.

Errors in Performance Management can also be detected using JP1/Base, which is an integrated system monitoring product, to monitor Performance Management log files. Using these monitoring results, the system administrator can detect problems when they occur, identify their causes, and take the necessary corrective actions.

For details about how to detect errors in Performance Management, see the chapter that explains error detection in Performance Management in the *Job Management Partner 1/Performance Management User's Guide*.

## 7.7 Recovering from Performance Management system errors

---

When an error occurs on the Performance Management server, you need to restore it to the normal state that existed before the error occurred, based on backup files.

For details about how to restore the Performance Management server to the state that existed before the error, see the chapter that explains troubleshooting in the *Job Management Partner 1/Performance Management User's Guide*.

# Appendixes

## A. Estimating System Requirements

---

Before you create a system that uses PFM - RM for Virtual Machine, confirm that the machine on which that system will be created is capable of running PFM - RM for Virtual Machine.

### A.1 Memory requirement

Memory requirements depend on how PFM - RM for Virtual Machine is set up and used. For details about the formula for estimating memory requirements, see the *Release Notes*.

### A.2 Disk occupancy

Disk space requirements depend on the number of records used to collect performance data.

To estimate how much disk space PFM - RM for Virtual Machine requires, you must estimate the disk space requirements for either the entire system or for the Store database. For the estimation formulas for these disk space requirements, see the *Release Notes*.



## B. List of Identifiers

When you operate PFM - RM for Virtual Machine or extract performance data from the Store database of PFM - RM for Virtual Machine, an identifier indicating PFM - RM for Virtual Machine is required in some cases. The table below shows the PFM - RM for Virtual Machine identifiers.

Table B–1: List of identifiers for PFM - RM for Virtual Machine

Application	Name	Identifier	Explanation
Commands, etc.	Product ID	8	A product ID is part of a service ID. A service ID is required when you use a command to check the system configuration of Performance Management or to back up performance data. For details about the service ID, see the chapter that explains the functions of Performance Management in the <i>Job Management Partner 1/Performance Management Planning and Configuration Guide</i> .
	Service key	RMVM	A service key is required when you use a command to start or stop PFM - RM for Virtual Machine. For details about the service key, see the chapter that explains the functions of Performance Management in the <i>Job Management Partner 1/Performance Management Planning and Configuration Guide</i> .
ODBC	Product type identifier	RMVIRTMACHINE	A product type identifier is required when you use an SQL statement to extract data. For details, see the chapter that explains linkage to ODBC-compatible application programs in the <i>Job Management Partner 1/Performance Management User's Guide</i> .
Help	Help ID	pca8	Help ID indicates a help item for PFM - RM for Virtual Machine.

## C. List of Processes

This appendix lists the PFM - RM for Virtual Machine processes.

The PFM - RM for Virtual Machine processes are listed in the table below. The value following the process name indicates the number of processes that can run concurrently.

*Note:*

The processes that can run and the number of processes that can run concurrently also apply to PFM - RM running on a logical host.

**Table C–1: PFM - RM for Virtual Machine process list**

Process name (process count)	Function
jpcagt8.exe (n)	Remote Monitor Collector service process. This process starts for each instance of PFM - RM for Virtual Machine.
jpc8collect.exe (n) <sup>#1</sup>	Remote Monitor Collector collection process. This process starts for each instance of PFM - RM for Virtual Machine. This process runs as a subprogram of jpcagt8.exe.
jpcagt8hyperv.exe (n) <sup>#2</sup>	Collection process for Hyper-V. This process starts during collection for each instance of PFM - RM for Virtual Machine that monitors Hyper-V, and stops when collection is completed.
jpcagt8kvm.exe (n) <sup>#2</sup>	Collection process for KVM. This process starts during collection for each instance of PFM - RM for Virtual Machine that monitors KVM, and stops when collection is completed.
jpcsto.exe (n)	Remote Monitor Store service process. This process starts for each instance of PFM - RM for Virtual Machine.
stpqlpr.exe (1) <sup>#3</sup>	Store database backup/export execution process
hntr2srv.exe (1) <sup>#4</sup>	Integrated trace startup service
hntr2mon.exe (1) <sup>#4</sup>	Integrated trace service

#1

This is a child process of the jpcagt8 process.

#2

This is a child process of the jpc8collect process.

#3

This is a child process of the jpcsto process.

#4

This process is shared by programs that are installed on the same machine and that use the integrated trace log.

## D. List of Port Numbers

This appendix describes the port numbers used by PFM - RM for Virtual Machine.

For details about the port numbers of PFM - Manager and PFM - Base, and the firewall passage direction, see the appendix section of the manual *Job Management Partner 1/Performance Management Reference*.

You can also change the port numbers to the desired numbers according to the user environment.

For details about how to change port numbers, see the chapter that explains installation and setup in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*. The protocol used is TCP/IP.

*Note:*

Performance Management supports static NAT (Basic NAT), in which addresses are translated on a 1-to-1 basis.

Performance Management does not support dynamic NAT or NATP (IP Masquerade or NAT+) that includes a port translation function.

### D.1 Port numbers of PFM - RM for Virtual Machine

The following table shows the port numbers used by PFM - RM for Virtual Machine.

Table D–1: Port numbers used by PFM - RM for Virtual Machine

Port number	Service name	Parameter	Application
Automatic <sup>#1</sup>	Remote Monitor Store service	jplpcsto8[ <i>nnn</i> ] <sup>#2</sup>	Used for recording performance data and acquiring historical reports
Automatic <sup>#1</sup>	Remote Monitor Collector service	jplpcagt8[ <i>nnn</i> ] <sup>#2</sup>	Used for binding alarms and acquiring real-time reports

<sup>#1</sup>

Each time the service is restarted, a port number not being used by the system is automatically assigned.

<sup>#2</sup>

When multiple instances are created, serial numbers (*nnn*) are added to the second and subsequent instances. No serial number is added to the first instance created.

### D.2 Firewall passage direction

#### (1) Setting up the firewall passage direction

When PFM - Manager and PFM - RM for Virtual Machine are installed across a firewall, set up fixed port numbers for all services of PFM - Manager and PFM - RM for Virtual Machine. Furthermore, set up each port number in the direction shown in the table below to allow all services to pass through the firewall.

Table D–2: Firewall passage direction (between PFM - Manager and PFM - RM for Virtual Machine)

Service name	Parameter	Passage direction
Remote Monitor Store service	jplpcsto8[ <i>nnn</i> ] <sup>#</sup>	RM ← Manager

Service name	Parameter	Passage direction
Remote Monitor Collector service	jp1pcagt8[ <i>nnn</i> ] <sup>#</sup>	RM ← Manager

Legend:

Manager: PFM - Manager host

RM: PFM - RM host

← : Direction for starting communication (connection) from the item on the right to the item on the left

#

When multiple instances are created, serial numbers (*nnn*) are added to the second and subsequent instances. No serial number is added to the first instance created.

When communication (connection) is started, the side receiving the connection (the side to which the arrow points) uses the port number in Table D-1 as the receiving port. The connecting side uses a free port number assigned by the OS. The range of port numbers used in this case varies according to the OS.

For RM ← Manager in the above table, set up the firewall such that the sending port temporarily used by Manager can pass through the receiving port of RM.

Note:

To execute the `jpctool db dump` command or the `jpctool service list` command on the PFM - RM host, use either of the following methods:

- In the `jpctool db dump` command or `jpctool service list` command, specify the `proxy` option such that communication takes place via PFM - Manager. For details about the `proxy` option of the `jpctool db dump` command or `jpctool service list` command, see the chapter that explains commands in the manual *Job Management Partner 1/Performance Management Reference*.
- Set port numbers between PFM - RM hosts in the directions shown in the table below to allow them to pass through the firewall.

Table D–3: Firewall passage direction (between PFM - RM hosts)

Service name	Parameter	Passage direction
Remote Monitor Store service	jp1pcsto8[ <i>nnn</i> ] <sup>#</sup>	RM ← → RM
Remote Monitor Collector service	jp1pcagt8[ <i>nnn</i> ] <sup>#</sup>	RM ← → RM

Legend:

RM: PFM - RM host

← → : Direction for starting communication (connection) from the item on the left to the item on the right, and from the item on the right to the item on the left

#

When multiple instances are created, serial numbers (*nnn*) are added to the second and subsequent instances. No serial number is added to the first instance created.

## (2) Setting up the firewall passage direction (in a logical host operation)

When PFM - Manager and PFM - RM for Virtual Machine are installed across a firewall, set fixed port numbers for all services of PFM - Manager and PFM - RM for Virtual Machine. Furthermore, set each port number in the direction shown in the table below to allow all services to pass through the firewall.

**Table D–4: Firewall passage direction (between PFM - Manager and PFM - RM for Virtual Machine (in a logical host operation))**

Service name	Parameter	Passage direction
Remote Monitor Store service (logical host)	jp1pcsto8[ <i>nnn</i> ] <sup>#</sup>	RM (logical host) ← Manager
Remote Monitor Collector service (logical host)	jp1pcagt8[ <i>nnn</i> ] <sup>#</sup>	RM (logical host) ← Manager

Legend:

Manager: PFM - Manager host

RM (logical host): PFM - RM host

← : Direction for starting communication (connection) from the item on the right to the item on the left

#

When multiple instances are created, serial numbers (*nnn*) are added to the second and subsequent instances. No serial number is added to the first instance created.

When communication (connection) is started, the side receiving the connection (the side to which the arrow points) uses the port number in Table D-1 as the receiving port. The connecting side uses a free port number assigned by the OS. The range of port numbers used in this case varies according to the OS.

For RM (logical host) ← Manager, set up the firewall such that the sending port temporarily used by Manager can pass through the receiving port of the logical host of RM.

### (3) Firewall passage direction during communication between PFM - RM for Virtual Machine and VMware

To collect VMware information, PFM - RM for Virtual Machine needs to communicate with VMware. Therefore, if there is a firewall between PFM - RM for Virtual Machine and VMware, set the firewall to permit communication over the port of the monitoring target set on the PFM - RM for Virtual Machine host. The communication direction between PFM - RM for Virtual Machine and VMware is shown below.

Passage direction
PFM - RM for Virtual Machine (Remote Monitor Collector service) → VMware

Legend:

→ : Direction for starting communication (connection) from the item on the left to the item on the right

The table below shows port numbers that can be used for communication with a monitoring target. For details, see [2.1.4\(4\) Setting up monitoring targets](#).

**Table D–5: Port numbers that can be used for communication with a monitoring target**

Description	Setting item	Value that can be set	Default
VMware target port number	Port	0-65,535	Port = 0 <sup>#</sup>

#

When Port = 0, use the following port number according to the Security value:

- When the Security value is 0:  
Port = 80
- When the Security value is 1:

Port = 443

## (4) Firewall passage direction during communication between PFM - RM for Virtual Machine and Hyper-V

To collect Hyper-V information, it is necessary for PFM - RM for Virtual Machine to use WMI to communicate with Hyper-V. Therefore, when PFM - RM for Virtual Machine and Hyper-V are installed across a firewall, passage through the firewall must be enabled.

Passage direction
PFM - RM for Virtual Machine (Remote Monitor Collector service) → Hyper-V

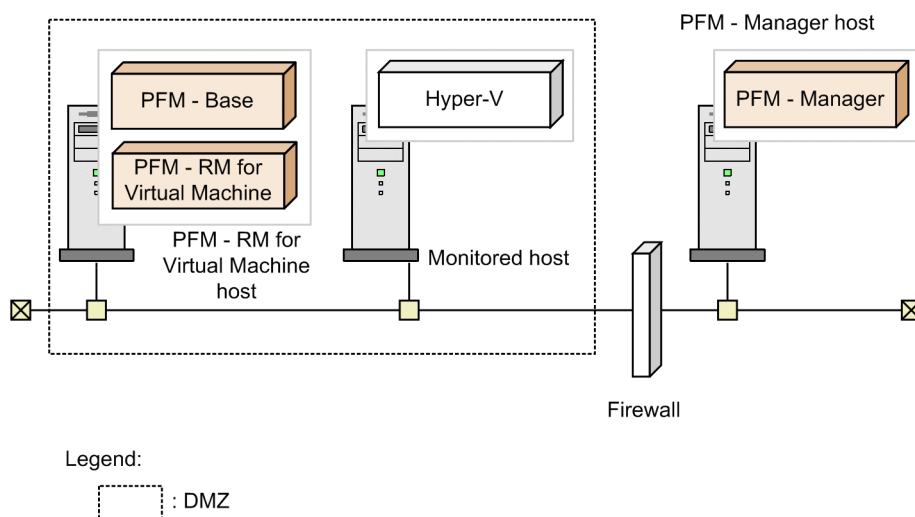
Legend:

→ : Direction for starting communication (for connecting) from the item on the left to the item on the right

WMI uses DCOM. Because DCOM uses dynamic port allocation, the port used for DCOM must pass through the firewall. For details about the setup method, see the firewall product's documentation or check with the firewall product's developer.

Operation via a firewall is not suitable because individual WMI and DCOM requests cannot be separated. The following figure shows a recommended configuration.

Figure D-1: Example of configuration where the port used for DCOM passes through a firewall



## (5) Firewall passage direction during communication between PFM - RM for Virtual Machine and KVM

To collect KVM information, it is necessary for PFM - RM for Virtual Machine to communicate via SSH. Therefore, when PFM - RM for Virtual Machine and KVM are installed across a firewall, set the firewall to permit communication over the port of the monitoring target set on the PFM - RM for Virtual Machine host. The communication direction between PFM - RM for Virtual Machine and KVM is shown below.

Passage direction
PFM - RM for Virtual Machine (Remote Monitor Collector service) → KVM

Legend:

→ : Direction for starting communication (for connecting) from the item on the left to the item on the right

The table below shows port numbers that can be used for communication with a monitoring target. For details, see [2.1.4\(4\) Setting up monitoring targets](#).

Table D–6: Port numbers that can be used for communication with a monitoring target

Description	Setting item	Value that can be set	Default
KVM port number for an SSH connection	Port	0-65,535	Port = 0 <sup>#</sup>

#

When Port = 0, the system will actually use port number 22, which is the default port number for SSH communication.

## E. Properties of PFM - RM for Virtual Machine

This appendix describes the Remote Monitor Store service property list and Remote Monitor Collector service property list of PFM - RM for Virtual Machine. These lists are displayed on PFM - Web Console.

### E.1 Remote Monitor Store service property list

The table below shows the Remote Monitor Store service property list of PFM - RM for Virtual Machine.

Table E–1: Remote Monitor Store service property list of PFM - RM for Virtual Machine

Folder name	Property name	Explanation
--	First Registration Date	Shows the first date/time on which the service was recognized by PFM - Manager.
	Last Registration Date	Shows the last date/time on which the service was recognized by PFM - Manager.
General	--	Stores information such as host names and folder names. The properties stored in this folder cannot be modified.
	Directory	Shows the name of the current folder in which the service is running.
	Host Name	Shows the name of the host on which the service is running.
	Process ID	Shows the process ID of the service.
	Physical Address	Shows the IP address and port number of the host on which the service runs if IPv6 communication is disabled.
	Physical Address (IPv4)	Shows the IPv4-format IP address of the host on which the service runs if IPv6 communication is enabled.
	Physical Address (IPv6)	Shows the IPv6-format IP address of the host on which the service runs if IPv6 communication is enabled.
	Port Number	Shows the number of the port that is used by the service if IPv6 communication is enabled.
	User Name	Shows the name of the user that executed the service process.
	Time Zone	Shows the time zone used by the service.
System	--	Stores information on the OS under which the service was started. The properties stored in this folder cannot be modified.
	CPU Type	Shows the CPU type.
	Hardware ID	Shows the hardware ID.
	OS Type	Shows the OS type.
	OS Name	Shows the OS name.
	OS Version	Shows the OS version.
Network Services	--	Stores information about the communication common library of Performance Management. The properties stored in this folder cannot be modified.



Folder name		Property name	Explanation
Network Services		Build Date	Shows the Remote Monitor Store service creation date.
		INI File	Shows the name of the folder that stores the <code>jpcns.ini</code> file.
Network Services	Service	--	Stores information about the service. The properties stored in this folder cannot be modified.
		Description	Shows additional service information, such as the host name and service type.  Shows the host name in the following format: <i>instance-name_host-name</i>
		Local Service Name	Shows the service ID.
		Remote Service Name	Shows the service ID of the Master Manager service of the PFM - Manager host at the connection destination.
		EP Service Name	Shows the service ID of the Correlator service of the PFM - Manager host at the connection destination.
RetentionEx		--	When the Store version is 2.0, a data retention period is set in this folder. For details, see the chapter that explains management of operation monitoring data in the <i>Job Management Partner 1/Performance Management User's Guide</i> .
RetentionEx	Product Interval - <i>record-ID-of-PI-record-type</i>	--	Specifies the PI record type record retention period.
		Period - Minute Drawer (Day)	Specifies the minute-by-minute PI record type record retention period. The value that can be specified is 0-366 days, in 1-day increments.
		Period - Hour Drawer (Day)	Specifies the hourly PI record type record retention period. The value that can be specified is 0-366 days, in 1-day increments.
		Period - Day Drawer (Week)	Specifies the daily PI record type record retention period. The value that can be specified is 0-522 weeks, in 1-week increments.
		Period - Week Drawer (Week)	Specifies the weekly PI record type record retention period. The value that can be specified is 0-522 weeks, in 1-week increments.
		Period - Month Drawer (Month)	Specifies the monthly PI record type record retention period. The value that can be specified is 0-120 months, in 1-month increments.
		Period - Year Drawer (Year)	Specifies the yearly PI record type record retention period. Although 10 will be displayed as the fixed value, there is no limit.
	Product Detail - <i>record-ID-of-PD-record-type</i>	Period (Day)	Specifies a performance data retention period for each PD record type record ID.  Specify an integer between 0 and 366 for the retention period (number of days).
Disk Usage		--	Stores the disk size being used by each database. The properties stored in this folder show the disk usage when the properties are displayed. The properties stored in this folder cannot be modified.

Folder name	Property name	Explanation
Disk Usage	Product Interval	Shows the disk size being used by PI record type records.
	Product Detail	Shows the disk size being used by PD record type records.
	Product Alarm	Shows the disk size being used by PA record type records. This property is not used by PFM - RM for Virtual Machine.
	Product Log	Shows the disk size being used by PL record type records. This property is not used by PFM - RM for Virtual Machine.
	Total Disk Usage	Shows the disk size being used in the entire database.

Legend:

--: Not applicable

## E.2 Remote Monitor Collector service property list

The table below shows the Remote Monitor Collector service property list of PFM - RM for Virtual Machine.

Table E–2: Remote Monitor Collector service property list of PFM - RM for Virtual Machine

Folder name	Property name	Explanation
--	First Registration Date	Shows the first date/time on which the service was recognized by PFM - Manager.
	Last Registration Date	Shows the last date/time on which the service was recognized by PFM - Manager.
	Data Model Version	Shows the data model version.
General	--	Stores information such as host names and folder names. The properties stored in this folder cannot be modified.
	Directory	Shows the name of the current folder in which the service is running.
	Host Name	Shows the name of the host on which the service is running.
	Process ID	Shows the process ID of the service.
	Physical Address	Shows the IP address and port number of the host on which the service runs if IPv6 communication is disabled.
	Physical Address (IPv4)	Shows the IPv4-format IP address of the host on which the service runs if IPv6 communication is enabled.
	Physical Address (IPv6)	Shows the IPv6-format IP address of the host on which the service runs if IPv6 communication is enabled.
	Port Number	Shows the number of the port that is used by the service if IPv6 communication is enabled.
	User Name	Shows the name of the user that executed the service process.
	Time Zone	Shows the time zone used by the service.

Folder name		Property name	Explanation
System		--	Stores information on the OS under which the service was started. The properties stored in this folder cannot be modified.
		CPU Type	Shows the CPU type.
		Hardware ID	Shows the hardware ID.
		OS Type	Shows the OS type.
		OS Name	Shows the OS name.
		OS Version	Shows the OS version.
Network Services		--	Stores information about the communication common library of Performance Management. The properties stored in this folder cannot be modified.
		Build Date	Shows the Remote Monitor Collector service creation date.
		INI File	Shows the name of the folder that stores the <code>jpcns.ini</code> file.
Network Services	Service	--	Stores information about the service. The properties stored in this folder cannot be modified.
		Description	Shows the host name in the following format: <i>instance-name_host-name</i>
		Local Service Name	Shows the service ID.
		Remote Service Name	Shows the service ID of the Remote Monitor Store service to which Remote Monitor Collector service connects.
		EP Service Name	Shows the service ID of the Correlator service of the PFM - Manager host at the connection destination.
		AH Service Name	Shows the service ID of the Action Handler service that is on the same host.
JP1 Event Configurations		--	Stores the properties of JP1 event generation conditions.
		Each service	From the list items in the Remote Monitor Collector service, Remote Monitor Store service, Action Handler service, and Status Server service, select <code>Yes</code> or <code>No</code> to specify whether each service should generate JP1 system events.
		JP1 Event Send Host	Specifies the target event server name for JP1/Base. You can specify only an event server that is running on the logical or physical host on the same machine as the Action Handler service. The values that can be specified are alphanumeric characters, the period (.), and the dash (–) for a total of between 0 and 255 bytes. If a value outside the range is specified, it is assumed that no value is specified. If value specification is omitted, the host on which the Action Handler service is running is used as the event-generation source host. If <code>localhost</code> is specified, it is assumed that the physical host is specified.
		Monitoring Console Host	When the browser of PFM - Web Console is to be started during the startup of the monitor of JP1/IM - Manager, this property specifies the PFM - Web Console host to be started. The values that can be specified are alphanumeric characters, the period (.), and the dash (–) for a total of between 0 and 255 bytes. If a value outside the range is specified, it is

Folder name		Property name	Explanation
JP1 Event Configurations		Monitoring Console Host	assumed that no value is specified. If value specification is omitted, the PFM - Manager host at the connection destination is assumed.
		Monitoring Console Port	Specifies the port number (HTTP request port number) of PFM - Web Console to be started. A value between 1 and 65,535 can be specified. If a value outside the range is specified, it is assumed that no value is specified. If value specification is omitted, 20,358 is set.
JP1 Event Configurations	Alarm	JP1 Event Mode	Specifies whether a JP1 system event or JP1 user event will be generated when an alarm status changes. <ul style="list-style-type: none"><li>JP1 User Event: Generates a JP1 user event.</li><li>JP1 System Event: Generates a JP1 system event.</li></ul>
Detail Records		--	Stores PD record type record properties. The record IDs of collected records are shown in bold characters.
Detail Records	record-ID <sup>#</sup>	--	Stores record properties.
		Description	Shows record descriptions. This property cannot be modified.
		Log	From the list items, select Yes or No to specify whether to record records in the Remote Monitor Store database. If this value is Yes and Collection Interval is greater than 0, records are recorded in the database.
		Log (ITSLM)	Shows Yes or No to indicate whether records are to be saved in the Store database of PFM - RM for Virtual Machine from JP1/ITSLM - Manager. This value is fixed to No.
		Monitoring (ITSLM)	Shows the value (Yes or No) that was set in JP1/ITSLM - Manager to indicate whether records are to be sent to JP1/ITSLM - Manager. This value is fixed to No.
		Collection Interval	Specifies the data collection interval. The value that can be specified is 0-2,147,483,647 seconds, in 1-second increments. If 0 is specified, no data is collected.
		Collection Offset	Specifies the offset for starting data collection. The value that can be specified is 0-32,767 seconds, in 1-second increments, and must be within the value range specified in Collection Interval. The data collection recording time is the same as Collection Interval and does not depend on the Collection Offset value.
		LOGIF	Specifies the condition for recording records in the database. Only those records that satisfy the condition are recorded in the database. Shows the conditional expression (character string) created in the LOGIF Expression Editor window, which opens when <b>LOGIF</b> is clicked in the lower frame of the Properties window of the service displayed from the <b>Services</b> page of PFM - Web Console.
Interval Records		--	Stores PI record type record properties. The record IDs of collected records are shown in bold characters.
Interval Records	record-ID <sup>#</sup>	--	Stores record properties.
		Description	Shows record description. This property cannot be modified.
		Log	From the list items, select Yes or No to specify whether to record records in the Remote Monitor Store database. If this

Folder name		Property name	Explanation
Interval Records	record-ID <sup>#</sup>	Log	value is Yes and Collection Interval is greater than 0, records are recorded in the database.
		Log (ITSLM)	Shows Yes or No to indicate whether records are to be saved in the Store database of PFM - RM for Virtual Machine from JP1/ITSLM - Manager. This value is fixed to No.
		Monitoring (ITSLM)	Shows the value (Yes or No) that was set in JP1/ITSLM - Manager to indicate whether records are to be sent to JP1/ITSLM - Manager. This value is fixed to No.
		Collection Interval	Specifies the data collection interval. The value that can be specified is 0-2,147,483,647 seconds, in 1-second increments. If 0 is specified, no data is collected.
		Collection Offset	Specifies the offset for starting data collection. The value that can be specified is 0-32,767 seconds, in 1-second increments, and must be within the value range specified in Collection Interval. The data collection recording time is the same as Collection Interval and does not depend on the Collection Offset value.
		LOGIF	Specifies the condition for recording records in the database. Only those records that satisfy the condition are recorded in the database. Shows the conditional expression (character string) created in the LOGIF Expression Editor window, which opens when <b>LOGIF</b> is clicked in the lower frame of the Properties window of the service displayed from the <b>Services</b> page of PFM - Web Console.
Log Records		--	Stores PL record type record properties. This folder is not used by PFM - RM for Virtual Machine because it does not support PL records.
Monitoring Targets		--	Stores the properties of hosts that are monitored by PFM - RM for Virtual Machine.
Monitoring Targets	monitoring-target-names	--	Shows a description of each monitoring target.
		Target Name	Shows the name of a monitoring target. This property cannot be changed.
		Target Host	Shows the name of a monitoring-target host. This property cannot be changed.
Health Check Configurations		Health Check for Target Hosts	Specifies whether to perform polling for monitoring-target hosts. This setting is applied to all monitoring-target hosts within the instance.
Restart Configurations		--	Specifies the PFM service automatic restart condition. For details about the PFM service automatic restart function, see the chapter that explains the functions of Performance Management in the <i>Job Management Partner 1/Performance Management Planning and Configuration Guide</i> .
		Restart when Abnormal Status	Specifies whether to automatically restart a service when the Status Server service cannot normally collect the status of the Action Handler service, Remote Monitor Collector service, or Remote Monitor Store service.
		Restart when Single Service Running	Specifies whether to automatically restart a service when either the Remote Monitor Store service or Remote Monitor Collector service has not been started.

Folder name		Property name	Explanation
Restart Configurations	Remote Monitor Collector	Auto Restart	Specifies whether to use the automatic restart function for the Remote Monitor Collector service.
		Auto Restart - Interval (Minute)	Specifies the interval for checking the operating status of services (in minutes) when the automatic restart function is used.
		Auto Restart - Repeat Limit	Specifies the number of times auto restart should be consecutively tried when the automatic restart function is used.
		Scheduled Restart	Specifies whether to use the scheduled restart function for the Remote Monitor Collector service.
		Scheduled Restart - Interval	Specifies the restart interval when the scheduled restart function is used.
		Scheduled Restart - Interval Unit	Specifies the restart interval unit when the scheduled restart function is used.
		Scheduled Restart - Origin - Year	Specifies an integer between 1971 and 2035 as the year for restart.
		Scheduled Restart - Origin - Month	Specifies an integer between 1 and 12 as the month for restart.
		Scheduled Restart - Origin - Day	Specifies an integer between 1 and 31 as the day for restart.
		Scheduled Restart - Origin - Hour	Specifies an integer between 0 and 23 as the time (hour) for restart.
		Scheduled Restart - Origin - Minute	Specifies an integer between 0 and 59 as the time (minutes) for restart.
	Remote Monitor Store	Auto Restart	Specifies whether to use the automatic restart function for the Remote Monitor Store service.
		Auto Restart - Interval (Minute)	Specifies the interval for checking the operating status of services (in minutes) when the automatic restart function is used.
		Auto Restart - Repeat Limit	Specifies the number of times auto restart should be consecutively tried when the automatic restart function is used.
		Scheduled Restart	Specifies whether to use the scheduled restart function for the Remote Monitor Store service.
		Scheduled Restart - Interval	Specifies the restart interval when the scheduled restart function is used.
		Scheduled Restart - Interval Unit	Specifies the restart interval unit when the scheduled restart function is used.

Folder name		Property name	Explanation
Restart Configurations	Remote Monitor Store	Scheduled Restart - Origin - Year	Specifies an integer between 1971 and 2035 as the year for restart.
		Scheduled Restart - Origin - Month	Specifies an integer between 1 and 12 as the month for restart.
		Scheduled Restart - Origin - Day	Specifies an integer between 1 and 31 as the day for restart.
		Scheduled Restart - Origin - Hour	Specifies an integer between 0 and 23 as the time (hour) for restart.
		Scheduled Restart - Origin - Minute	Specifies an integer between 0 and 59 as the time (minutes) for restart.
	Action Handler	Auto Restart	Specifies whether to use the automatic restart function for the Action Handler service.
		Auto Restart - Interval (Minute)	Specifies the interval for checking the operating status of services (in minutes) when the automatic restart function is used.
		Auto Restart - Repeat Limit	Specifies the number of times auto restart should be consecutively tried when the automatic restart function is used.
		Scheduled Restart	Specifies whether to use the scheduled restart function for the Action Handler service.
		Scheduled Restart - Interval	Specifies the restart interval when the scheduled restart function is used.
		Scheduled Restart - Interval Unit	Specifies the restart interval unit when the scheduled restart function is used.
		Scheduled Restart - Origin - Year	Specifies an integer between 1971 and 2035 as the year for restart.
		Scheduled Restart - Origin - Month	Specifies an integer between 1 and 12 as the month for restart.
		Scheduled Restart - Origin - Day	Specifies an integer between 1 and 31 as the day for restart.
		Scheduled Restart - Origin - Hour	Specifies an integer between 0 and 23 as the time (hour) for restart.
		Scheduled Restart - Origin - Minute	Specifies an integer between 0 and 59 as the time (minutes) for restart.
ITSLM Connection Configuration		--	Shows information about the JP1/ITSLM - Manager to link with.

Folder name		Property name	Explanation
ITSLM Connection Configuration	ITSLM Connection	--	Shows information about the JP1/ITSLM - Manager to connect to.
		ITSLM Host	Shows the host name of the connected JP1/ITSLM - Manager. This item is displayed only when a connection to JP1/ITSLM - Manager is established.
		ITSLM Port	Shows the port number of the connected JP1/ITSLM - Manager. This item is displayed only when a connection to JP1/ITSLM - Manager is established.
	MANAGE ITSLM CONNECTION	--	Shows whether to disconnect from the JP1/ITSLM - Manager.
		DISCONNECT ITSLM CONNECTION	From a list, select the name of the JP1/ITSLM - Manager host that you want to disconnect from. If you select a blank item, no action occurs. If no JP1/ITSLM - Manager hosts are connected, the list displays only a blank item.
Remote Monitor Configuration		--	Stores configuration properties specific to PFM - RM for Virtual Machine.
Remote Monitor Configuration	Remote Monitor	--	Shows an overview of the Remote Monitor Collector service.
		Product	Shows the product ID 8. This property cannot be modified.
		Instance	Shows the instance name specified by the <code>jpccconf inst setup</code> command. This property cannot be modified.
		VM_Type	Shows the type of the virtual environment to be monitored. This property cannot be modified. The following character string is displayed: <ul style="list-style-type: none"><li><code>vmware</code> (indicating VMware ESX or VMware ESXi)</li><li><code>hyperv</code> (indicating Hyper-V)</li><li><code>kvm</code> (indicating KVM)</li></ul>
		Interval	Specifies the interval at which the collection process collects information. The value of this property can be changed.
		Std_Category	Specifies whether the collection process outputs the basic information (PI, VI, and VM records) to a temporary performance information file. The value of this property can be changed.
		Cpu_Category	Specifies whether the collection process outputs the CPU information (HCI and VCI records) to a temporary performance information file. The value of this property can be changed.
		Memory_Category	Specifies whether the collection process outputs the memory information (HMI and VMI records) to a temporary performance information file. The value of this property can be changed.
		Disk_Category	Specifies whether the collection process outputs the disk information (HPDI, VPDI, HLDI, and VLDI records) to a temporary performance information file. The value of this property can be changed.
		Network_Category	Specifies whether the collection process outputs the network information (HNI and VNI records) to a temporary performance information file. The value of this property can be changed.



Folder name		Property name	Explanation
Remote Monitor Configuration	Remote Monitor	HostUserID	Displays the user ID of the PFM - RM host. The value of this property can be changed.
		HostPassword	Displays **** (fixed). This property cannot be changed.
		HostDomain	Displays the domain name of the PFM - RM host. The value of this property can be changed.
		SSH_Client	Specifies the absolute path of the SSH client (PuTTY) execution module ( <code>plink.exe</code> ). The value of this property can be changed.
		Log_Size	Specifies the maximum size of each file in the collected log (megabytes). The value of this property can be changed.
		UseVcpuMax	Specifies which is to be used as the CPU resource clock frequency: the frequency assigned to the virtual machine or the clock frequency of the physical CPU. The value of this property can be changed.

Legend:

--: Not applicable

#

For the folder name, a database ID excluding the record ID is displayed. For the record ID of each record, see [5. Records](#).

## E.3 Remote agent and group agent property list

The following table lists the properties of PFM - RM for Virtual Machine remote agents and group agents.

Table E–3: List of properties of PFM - RM for Virtual Machine remote agents and group agents

Folder name	Property name	Explanation	Remote Agent	Group Agent
--	First Registration Date	Shows the time at which the service was first recognized by PFM - Manager.	D	D
	Last Registration Date	Shows the time at which the service was last recognized by PFM - Manager.	D	D
	Data Model Version	Shows the data model version.	D	D
Remote Monitoring	--	Stores the properties for remote agents and group agents.	D	D
	Agent Type	Shows the agent type: <ul style="list-style-type: none"> <li>Remote Agent The agent is a remote agent.</li> <li>Group Agent The agent is a group agent.</li> </ul>	D	D
	Remote Monitor Name	Shows the service ID of PFM - RM for Virtual Machine.	D	D
	Target Name	Shows the monitoring target name.	D	N

Folder name		Property name	Explanation	Remote Agent	Group Agent
Remote Monitoring		Target Host	Shows the monitoring-target host name.	D	N
		Group Name	Shows the group name.	N	D
		Primary Host	Shows the primary host name.	N	D
		Grouping Targets	Lists the names of targets to be consolidated.	N	D
Detail Records		--	Stores the properties of records of the PD record type. The IDs of records that have been collected are indicated in bold type.	D	D
Detail Records	<i>record-ID</i> <sup>#2</sup>	--	Stores record properties.	D	D
		Description	Shows a description of the record.	D	D
		Log <sup>#1</sup>	Shows Yes or No to indicate whether to save records in the Store database of PFM - RM for Virtual Machine. If the value of this property is Yes and the Collection Interval value is greater than 0, records are saved in the database.	U	U
		Log (ITSLM) <sup>#1</sup>	Shows Yes or No to indicate whether to save records received from JP1/ITSLM - Manager in the Store database of PFM - RM for Virtual Machine. If the value of this property is Yes and the Collection Interval value is greater than 0, records are saved in the database. The value of this property cannot be changed.	D	D
		Monitoring (ITSLM)	Shows the value (Yes or No) that was set from JP1/ITSLM - Manager to indicate whether records are to be sent to JP1/ITSLM - Manager. The value of this property cannot be changed.	D	D
		Collection Interval	Specifies the data collection interval. You can specify a value from 0 through 2,147,483,647 in seconds. If you specify 0, data collection is disabled.	D <sup>#3</sup>	D <sup>#3</sup>
		Collection Offset	Specifies the offset value to apply before the first collection cycle. The value is in seconds, and can be from 0 through 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.	D <sup>#3</sup>	D <sup>#3</sup>
		LOGIF	Specifies the condition for recording records in the database. Only those records that satisfy the condition are recorded in the database. The conditional expression (string) created in the LOGIF Expression Editor window is displayed. This window	D <sup>#3</sup>	D <sup>#3</sup>

Folder name		Property name	Explanation	Remote Agent	Group Agent
Detail Records	<i>record-ID</i> <sup>#2</sup>	LOGIF	opens when <b>LOGIF</b> is clicked in the lower frame of the Properties window of the service displayed from the <b>Services</b> page of PFM - Web Console.	D <sup>#3</sup>	D <sup>#3</sup>
Interval Records		--	Stores the properties of records of the PI record type. The IDs of records that have been collected are indicated in bold type.	D	D
Interval Records	<i>record-ID</i> <sup>#2</sup>	--	Stores record properties.	D	D
		Description	Shows a description of the record. The value of this property cannot be changed.	D	D
		Log <sup>#1</sup>	Shows <b>Yes</b> or <b>No</b> to indicate whether to save records in the Store database of PFM - RM for Virtual Machine. If the value of this property is <b>Yes</b> and the Collection Interval value is greater than 0, records are saved in the database.	U	U
		Log (ITSLM) <sup>#1</sup>	Shows <b>Yes</b> or <b>No</b> to indicate whether to save records received from JP1/ITSLM - Manager in the Store database of PFM - RM for Virtual Machine. If the value of this property is <b>Yes</b> and the Collection Interval value is greater than 0, records are saved in the database. The value of this property cannot be changed.	D	D
		Monitoring (ITSLM)	Shows the value ( <b>Yes</b> or <b>No</b> ) that was set from JP1/ITSLM - Manager to indicate whether records are to be sent to JP1/ITSLM - Manager. The value of this property cannot be changed.	D	D
		Collection Interval	Specifies the data collection interval. You can specify a value from 0 through 2,147,483,647 in seconds. If you specify 0, data collection is disabled.	D <sup>#3</sup>	D <sup>#3</sup>
		Collection Offset	Specifies the offset value to apply before the first collection cycle. The value is in seconds, and can be from 0 through 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.	D <sup>#3</sup>	D <sup>#3</sup>
		LOGIF	Specifies the condition for recording records in the database. Only those records that satisfy the condition are recorded in the database. The conditional expression (string) created in the LOGIF Expression Editor window is displayed. This window opens when <b>LOGIF</b> is clicked in the lower frame of the Properties window of	D <sup>#3</sup>	D <sup>#3</sup>

Folder name			Property name	Explanation	Remote Agent	Group Agent
Interval Records	record-ID <sup>#2</sup>		LOGIF	the service displayed from the <b>Services</b> page of PFM - Web Console.	D <sup>#3</sup>	D <sup>#3</sup>
Log Records			--	Stores the properties of records of the PL record type. This property is not used in PFM - RM for Virtual Machine.	D	D
Remote Monitor Configuration			--	Stores configuration properties specific to the monitoring target.	D	N
Remote Monitor Configuration	Target		--	Shows an overview of the remote agent service.	D	N
	Target	monitoring-target - names	--	Shows the monitoring target name.	D	N
			VM_Host	Shows the host name of the monitoring-target physical server.	U	N
			Security	Specifies whether to use SSL for communication with the monitoring-target physical server. Either of the following values can be specified: <ul style="list-style-type: none"><li>0: Do not use SSL.</li><li>1: Use SSL.</li></ul>	U	N
			Port	Specifies the number of the port that is to be used for communication with the monitoring-target physical server. If VMware is being used and the value of this property is 0, the system selects the port number depending on the Security value as follows: <ul style="list-style-type: none"><li>Security = 0 (SSL is not used.) HTTP default port number of 80</li><li>Security = 1 (SSL is used.) HTTPS default port number of 443</li></ul> If KVM is being used and the value of this property is 0, the system uses the SSH default port number of 22.	U	N
			UserID	Specifies the user ID that is used to connect to the monitoring-target physical server. Note that this property is valid only when the monitoring-target host is a VMware, Hyper-V, or KVM host.	U	N
			Password	Shows the fixed string **** as the password that is used to connect to the monitoring-target physical server. The value of this property cannot be changed. Note that this property is valid only when the monitoring-target host is a VMware or Hyper-V host.	D	N
			Domain	Specifies the name of the domain that the monitoring-target physical server belongs to. Note that this property is	U	N

Folder name			Property name	Explanation	Remote Agent	Group Agent
Remote Monitor Configuration	Target	<i>monitoring-target-names</i>	Domain	valid only when the monitoring-target host is a Hyper-V host.	U	N
			Private_Key_File	Specifies the absolute path name of the private key file that is used for SSH public key based authentication. Note that this property is valid only when the monitoring-target host is a KVM host.	U	N

#### Legend:

--: Not applicable

U: This property is displayed and can be updated.

D: This property is displayed but cannot be updated.

N: This property is not displayed (and cannot be updated).

#1

If either of these properties is Yes, records are saved in the Store database.

#2

The record ID excluding the database ID is displayed as the folder name. For the ID of each record, see [5. Records](#).

#3

The value set in PFM - RM for Virtual Machine is displayed.

## F. List of Files and Folders

This appendix describes the file and folder list of PFM - RM for Virtual Machine.

You can specify any folder as the installation folder for Performance Management. The following is the default installation folder:

- In Windows Server 2003 (x64), the 64-bit edition of Windows Server 2008, and Windows Server 2012  
*system-drive*\Program Files (x86)\Hitachi\jplpc\
  - All other cases  
*system-drive*\Program Files\Hitachi\jplpc\

### F.1 PFM - RM for Virtual Machine file and folder list

The table below shows the PFM - RM for Virtual Machine file and folder list.

Table F–1: PFM - RM for Virtual Machine file and folder list

Folder name	File name	Explanation
<i>installation-folder</i> \	instagt8.ini	Intermediate file for internal processing
<i>installation-folder</i> \agt8\	--	PFM - RM for Virtual Machine base folder
	insrules.dat	Intermediate file for internal processing
	jpcagtras.bat	Maintenance data collection program
	PATCHLOG.TXT	Intermediate file for internal processing <sup>#1</sup>
	readme.txt	Readme text file
	VERSION.TXT	Version information file
<i>installation-folder</i> \agt8\agent\	--	Remote Monitor Collector service base folder
	jpcagt.ini.instmpl	Intermediate file for internal processing
	jpcagt8.exe	Remote Monitor Collector service execution program
	jpc8collect.exe	Remote Monitor Collector record collection program
	jpcagt8hcc.dll	Hitachi common library file

Folder name	File name	Explanation
<i>installation-folder</i> \agt8\agent\	inssetup.bat.instmpl	Intermediate file for internal processing
	agtlst.ini	Intermediate file for internal processing#2
	GARULES.DAT	Group agent creation rule file
	group.ini.tmpl	Group agent settings template file
	target.ini.tmpl	Monitoring-target settings template file
	targetrules.dat	Monitoring-target creation rule file
	jpcagt8cfg.ini	PFM - RM for Virtual Machine setup file
<i>installation-folder</i> \agt8\plugin\	--	Folder for the Collector plug-ins
	jpcagt8hyperv.exe	Execution program of the Collector plug-in for Hyper-V
	jpcagt8hyperv.ini	Configuration file for the Collector plug-in for Hyper-V
	jpcagt8vmware.exe	Execution program of the Collector plug-in for VMware
	jpcagt8vmware.ini	Configuration file for the Collector plug-in for VMware
	jpcagt8kvm.exe	Execution program of the Collector plug-in for KVM
	jpcagt8kvm.ini	Configuration file for the Collector plug-in for KVM
<i>installation-folder</i> \agt8\plugin\jpcagt8hyperv.d\	--	Data folder for the Collector plug-in for Hyper-V#3
	jpcagt8hyperv.dat	Empty file
<i>installation-folder</i> \agt8\plugin\jpcagt8vmware.d\	--	Data folder for the Collector plug-in for VMware#3
	*.xml	XML for SOAP request (parameter can be embedded)

Folder name	File name	Explanation
<i>installation-folder</i> \agt8\plugin\jpcagt8kvm.d\	--	Data folder for the Collector plug-in for KVM <sup>#3</sup>
	command.dat	KVM request definition file
	procname.dat	KVM request definition file
<i>installation-folder</i> \agt8\lib\	--	Message catalog storage folder
	jpcagt8msg.dll	Message catalog file
<i>installation-folder</i> \agt8\store\	--	Store service base folder in which Remote Monitor is also located
	STDICT.DAT STRULES.DAT	Data model definition file
	jpcsto.ini.instmpl	Intermediate file for internal processing
	stolist.ini	Intermediate file for internal processing <sup>#2</sup>
<i>installation-folder</i> \patch_files\agt8\	--	Folder for storing files for patches (for Agent)
<i>installation-folder</i> \setup\	--	Setup file storage folder
	jpcagt8u.Z	PFM - RM setup archive file (UNIX)
	jpcagt8w.EXE	PFM - RM setup archive file (Windows)
<i>installation-folder</i> \agt8\agent\instance-name\	--	Remote Monitor Collector service base folder (all files under this folder are created for each instance) <sup>#2</sup>
	jpcagt.ini	Remote Monitor Collector service startup initialization file <sup>#2</sup>
	jpcagt.ini.lock	Lock file for the Remote Monitor Collector service startup initialization file (this file is created for each instance)



Folder name	File name	Explanation
<i>installation-folder</i> \agt8\agent\ <i>instance-name</i> \	jpcagt.ini.model	Model file for Remote Monitor Collector service startup initialization file <sup>#2</sup>
	status.dat	Intermediate file for internal processing <sup>#4</sup>
	inssetup.bat	jpcconf inst setup command extension processing for PFM - RM for Virtual Machine <sup>#2</sup>
	plugin.ini	Virtual environment connection definition file <sup>#2</sup>
	GARULES.DAT	Consolidation rule file
	grouplist.ini	Group list file
	targetlist.ini	Monitoring-target list file
	tstatuses.dat	Virtual-agent status information <sup>#5</sup>
<i>installation-folder</i> \agt8\agent\ <i>instance-name</i> \targets\	--	Folder for group agent
	monitoring-target-name.ini	Monitoring-target settings file
	monitoring-target-name.ini.model	Model file for the monitoring-target settings file
<i>installation-folder</i> \agt8\agent\ <i>instance-name</i> \targets\ <i>monitoring-target-name</i> \data\	--	Remote Monitor Collector service data folder <sup>#2</sup>
	records.dat	Performance data storage file <sup>#3, #6</sup>
	error.dat	For error messages <sup>#3, #6</sup>
	records.tmp	Intermediate file for internal processing <sup>#3, #6</sup>
	error.tmp	Intermediate file for internal processing <sup>#3, #6</sup>
<i>installation-folder</i> \agt8\agent\ <i>instance-name</i> \groups\	--	Group agent folder <sup>#2</sup>

Folder name	File name	Explanation
<i>installation-folder\agt8\agent\instance-name\groups\</i>	<i>group-name.ini</i>	Group agent settings file <sup>#3</sup>
<i>installation-folder\agt8\agent\instance-name\log\</i>	--	Folder for storing Remote Monitor Collector service internal log files <sup>#2</sup>
	<i>x_yN.log</i> (x: VM_Type value, y: <i>monitoring-target-name</i> )	Internal log file for Hyper-V collection processing <sup>#3</sup> Internal log file for VMware collection processing <sup>#3</sup> Internal log file for KVM collection processing <sup>#3</sup> (N: 1 through 8)
	msglog01 msglog02 msglog03 msglog04	Internal log files <sup>#6</sup>
	nslog01 nslog02	Internal log files <sup>#6</sup>
	collect_01 collect_02 collect_03	Internal log files <sup>#6</sup>
	timer_01 timer_02 timer_03	Internal log files <sup>#6</sup>
<i>installation-folder\agt8\agent\instance-name\monitoring-target-name\work\</i>	--	Work data storage folder for the Collector plug-in <sup>#2</sup>
	*	Intermediate file for internal processing <sup>#3, #6</sup>
<i>installation-folder\agt8\store\instance-name\</i>	--	Remote Monitor Store service base folder (all files under this folder are created for each instance) <sup>#2</sup>
	*.DB	Performance data file <sup>#7</sup>
	*.IDX	Index file of performance data file <sup>#7</sup>
	*.LCK	Lock file of performance data file <sup>#7</sup>

Folder name	File name	Explanation
<i>installation-folder\agt8\store\instance-name\</i>	jpcsto.ini	Remote Monitor Store service startup initialization file <sup>#2</sup>
	jpcsto.ini.model	Model for Remote Monitor Store service startup initialization file <sup>#2</sup>
	*.DAT	Data model definition file <sup>#2</sup>
	status.dat	Intermediate file for internal processing <sup>#4</sup>
<i>installation-folder\agt8\store\instance-name\STPD\</i>	--	Performance data file for PD records <sup>#7</sup>
<i>installation-folder\agt8\store\instance-name\STPI\</i>	--	Performance data file for PI records <sup>#7</sup>
<i>installation-folder\agt8\store\instance-name\STPL\</i>	--	Performance data file for PL records <sup>#7</sup>
<i>installation-folder\agt8\store\instance-name\backup\</i>	--	Default database backup folder <sup>#2</sup>
<i>installation-folder\agt8\store\instance-name\dump\</i>	--	Default database export folder <sup>#2</sup>
<i>installation-folder\agt8\store\instance-name\import\</i>	--	Default database import folder <sup>#2</sup>
<i>installation-folder\agt8\store\instance-name\log\</i>	--	Folder for storing Remote Monitor Store service internal log files <sup>#2</sup>
	msglog01 msglog02	Internal log files <sup>#7</sup>
	nslog01 nslog02	Internal log files <sup>#7</sup>
<i>installation-folder\agt8\store\instance-name\partial\</i>	--	Default database partial backup folder <sup>#2</sup>
<i>installation-folder\agt8\tools\</i>	--	Folder for storing the commands for only PFM - RM for Virtual Machine
	jpcaovm2rmvm.exe	Migration command
	jpcaovm2rmvm.ini	Migration command settings file
<i>installation-folder\agt8\tools\log\</i>	--	Migration command log folder
	jpcaovm2rmvm01.log jpcaovm2rmvm02.log	Migration command log files

Folder name	File name	Explanation
<i>installation-folder</i> \agt8\tools\log\	jpcavm2rmvm03.log	Migration command log files
<i>installation-folder</i> \agt8\tools\mapm\	--	Folder for storing migration command intermediate files
	jpcavm2rmvm.mm	Intermediate file for internal processing
<Program Files>\Hitachi\HNTRLib2\	--	Folder for storing HNTRLib2 execution files and include files
	*	HNTRLib2 execution files and include files
<Program Files>\Common Files\Hitachi\	--	Folder for storing HNTRLib2's public DLL
	*	HNTRLib2's public DLL

#### Legend:

--: Not applicable

- #1  
Created when a patch is applied.
- #2  
Created when the `jpcconf inst setup (jpcinssetup)` command is executed.
- #3  
This file is used internally by PFM - RM for Virtual Machine. Do not modify or delete it.
- #4  
May be temporarily created in some cases.
- #5  
Generated when the health check function is enabled.
- #6  
Created when the Remote Monitor Collector service is started or when a record is collected.
- #7  
Created when the Remote Monitor Store service is started.

## G. Migration from PFM - Agent for Virtual Machine to PFM - Remote Monitor for Virtual Machine

---

This appendix describes the procedures for migrating performance data collected by using PFM - Agent for Virtual Machine, as well as the properties of the Collector and Store services, to PFM - Remote Monitor for Virtual Machine. After migration, PFM - Remote Monitor for Virtual Machine can be used to display reports that were created by using PFM - Agent for Virtual Machine.

Prerequisites for migration and the applicable scope:

The prerequisites and applicable scope of PFM - Agent for Virtual Machine and those of PFM - RM for Virtual Machine are the same. However, to execute the migration command, PFM - Agent for Virtual Machine must also meet the following conditions:

- PFM - Agent for Virtual Machine, the migration source, and PFM - RM for Virtual Machine, the migration destination, must be installed on the same host.
- The version of PFM - Base or PFM - Manager installed on the same host on which PFM - RM for Virtual Machine must be installed is 10-00 or later.
- The version of PFM - Agent for Virtual Machine must be 09-01 or later.
- The Store version<sup>#</sup> of the PFM - Agent for Virtual Machine instance environment and backup files must be 2.0.
- The data model version<sup>#</sup> of the PFM - Agent for Virtual Machine instance environment and backup files must be 4.0.
- Migration from a physical host to a logical host, or vice versa, is impossible. Migration on the same physical host, on the same logical host, or between different logical hosts is possible.

#

For details about the Store version and data model version, see the chapter on the Store database and data models in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

Migration-target data:

The following describes what data is subject to migration, and what data is not.

Data subject to migration:

- Properties of the Collector and Store services, such as instance environment settings and performance data storage methods  
For details about migration of the properties of the Collector and Store services, see [G.6 Property settings of the Collector and Store services](#).
- Performance data

Data not subject to migration:

- Network environment settings and other system configuration information
- Performance data imported by PFM - Agent for Virtual Machine
- Performance data storage destinations
- Alarm definitions
- Report definitions
- JP1 events
- Settings for automatically restarting the PFM service
- Other settings that are not indicated in *Data subject to migration*

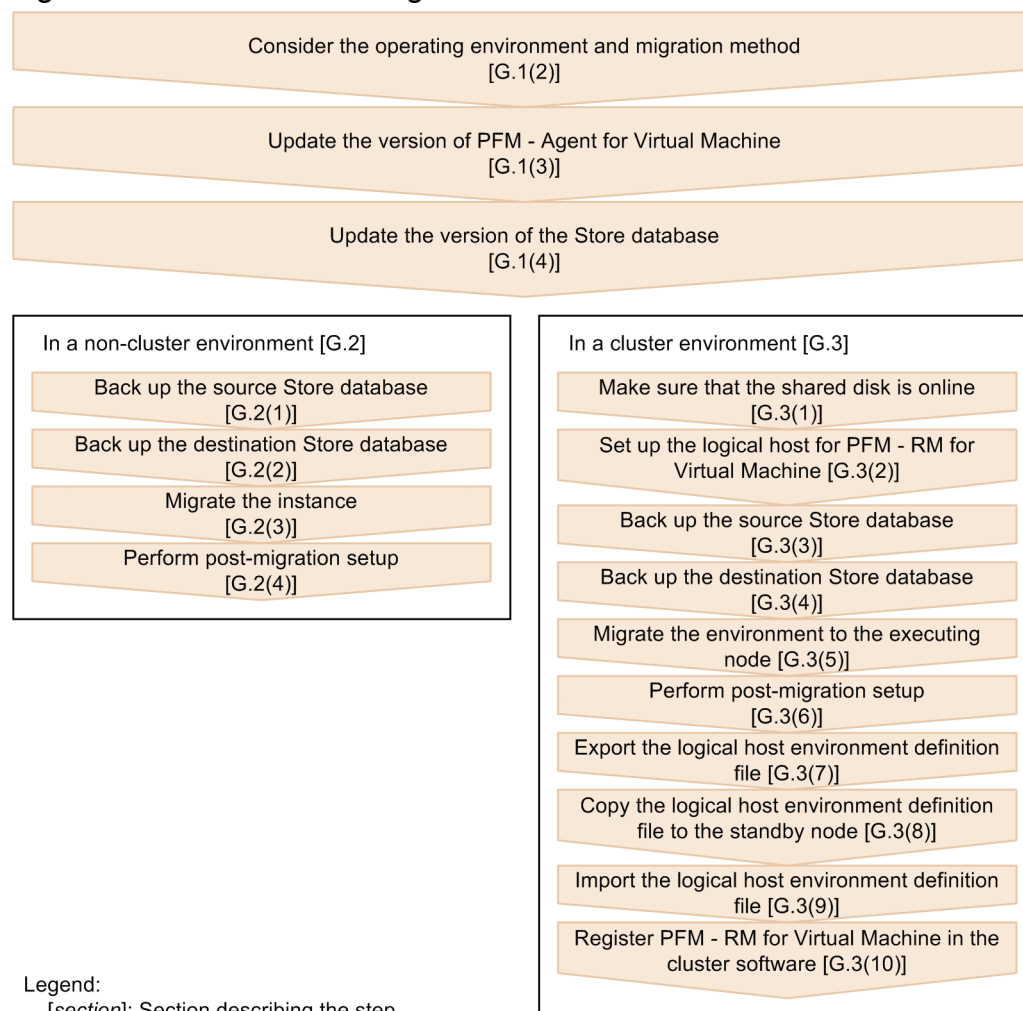
## G.1 Preparation for migration

This appendix describes the preparation that is needed before you can migrate the performance data that was collected by PFM - Agent for Virtual Machine and the properties of the Collector and Store services.

### (1) Overview of migration

The following shows an overview of migration.

Figure G–1: Overview of migration



### (2) Considering the operating environment and migration method

#### (a) Operating environment

Examine and consider the following items which form the environment for executing the migration command:

- System configuration
- PFM - Agent for Virtual Machine configurations
- Scale of the Store database

#### ■ System configuration

Check whether PFM - Agent for Virtual Machine is in a cluster configuration or in a non-cluster configuration.

## ■ PFM - Agent for Virtual Machine configurations

Check the PFM - Agent for Virtual Machine configurations, such as the network configuration, performance data collection interval (and offset), JP1 events, and settings for automatically restarting the PFM service.

## ■ Scale of the Store database

Check the scale of the Store database.

Because the Store database of PFM - RM for Virtual Machine has a more extended format than the Store database of PFM - Agent for Virtual Machine, the size of the Store database increases after migration. The size of the Store database also increases when multiple instances of PFM - Agent for Virtual Machine are integrated into one instance of PFM - RM for Virtual Machine. Note that migration is impossible if one of the database files that make up the destination Store database becomes larger than 2,048 MB.

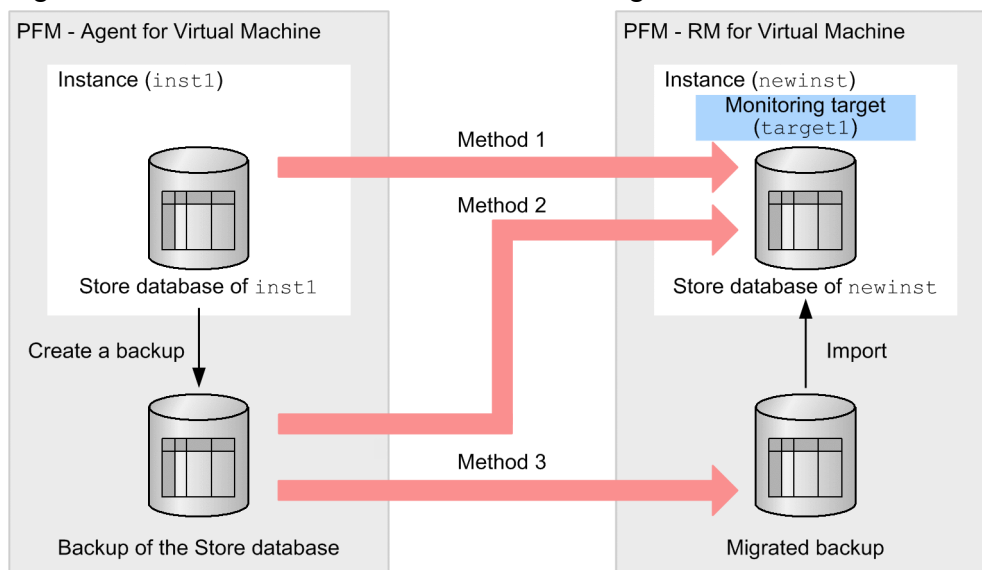
The migration command has a function that calculates the size that the database will have if migration is performed. Before migration, use this function to check whether the database size will exceed the maximum. For details about the size check function of the migration command, see the description of the `-sizecheck` option in [G.5 Command reference](#).

## (b) Migration methods

Decide the method you will use to migrate the Store database.

There are three methods that can be used to migrate the Store database.

Figure G–2: Overview of Store database migration



### Migration method 1:

The Store database of PFM - Agent for Virtual Machine is directly migrated to the Store database of PFM - RM for Virtual Machine.

Because the Store databases are directly accessed to read and write the data, the services of the PFM - Agent for Virtual Machine and PFM - RM for Virtual Machine instances must be stopped.

### Migration method 2:

A backup file for the Store database of PFM - Agent for Virtual Machine is first created, and then the backup file is used to migrate the data to the Store database of PFM - RM for Virtual Machine.

During migration, although you need to stop the service of the PFM - RM for Virtual Machine instance, you do not need to stop the service of the PFM - Agent for Virtual Machine instance.

### Migration method 3:

A backup file for the Store database of PFM - Agent for Virtual Machine is first created, and then, from the backup file, the data is migrated to the backup directory of PFM - RM for Virtual Machine.

The data in the migrated backup file becomes available by importing the file into PFM - RM for Virtual Machine. During migration, you do not need to stop the services of the PFM - Agent for Virtual Machine and PFM - RM for Virtual Machine instances. The backup file can be imported while the system is operating stably.

With this method, both migration-source and migration-destination backup files might contain data collected at the same point in time. In such a case, the data collected by PFM - RM for Virtual Machine takes precedence on a daily basis.

In addition to the above three methods, there is a method to migrate only the instance and monitoring target definitions. For example, you can use this method to start operating PFM - RM for Virtual Machine without migrating the Store database. Alternatively you can use this method to import a backup file migrated by method 3 into an instance environment after migrating the definitions.

## (3) Updating the version of PFM - Agent for Virtual Machine

The version of migration-source PFM - Agent for Virtual Machine must be 09-01 or later. If the version is 09-00 or earlier, update it to 09-01 or later. If the backup file to be migrated was created by 09-00 or an earlier version, convert the data model by executing the `jpctool db dmconvert` command.

## (4) Updating the version of the Store database

The Store version of the PFM - Agent for Virtual Machine instance environment must be 2.0. If the Store version is 1.0, you must update it to 2.0 before migration by executing the `jpccconf db vrset` command.

## G.2 Migration in a non-cluster environment

This appendix describes the procedure for migration in a non cluster-environment. Perform the necessary steps for each instance to be migrated.

### (1) Backing up the source Store database

If you use method 2 or 3 to migrate the Store database, create a backup file for the Store database of the instance that you want to migrate.

The following is an example of a command line that creates a backup file for the Store database in PFM - Agent for Virtual Machine.

```
C:\Program Files\Hitachi\jplpc\tools> jpctool db backup -id
5S1inst1[aovmhost]

KAVE06000-I Backup processing of the Store database terminated normally.
(service=5S1inst1[aovmhost])
```

### (2) Backing up the destination Store database

If you perform migration by adding a monitoring target to an existing instance environment, make sure that you back up the Store database of the migration-destination instance. (This is in case of a failure.)



The following is an example of a command line that creates a backup file for the Store database in PFM - RM for Virtual Machine.

```
C:\Program Files\Hitachi\jplpc\tools> jpctool db backup -id
8Slnewinst[rmvmhost]
KAVE06000-I Backup processing of the Store database terminated normally.
(service=8Slnewinst[rmvmhost])
```

### (3) Migrating the instance

Use the migration command to migrate the instance.

For details about how to use the migration command, see [G.8 Examples of executing the migration command](#). For details about the migration command, see [G.5 Command reference](#).

### (4) Performing post-migration setup

After migrating the Store database, perform the following tasks, if necessary:

#### (a) Specifying the network environment settings

Specify the IP address, port number, and other settings. For details about the network environment settings, see [2.1.4\(6\) Network settings](#).

#### (b) Setting the performance data storage destination

You can set the performance data storage destination if you want to store performance data somewhere other than the default storage destination. For details about setting the performance data storage destination, see [2.4.1 Changing the performance data storage destination](#).

The following is an example of a command line that changes the performance data storage destination.

```
C:\Program Files\Hitachi\jplpc\tools> jpccconf db define -key RMVM -inst
newinst -sd "c:\Store" -move

KAVE05856-I Updating the configuration information of the Store database
ended normally. (servicekey=RMVM, inst=newinst, label=Store Dir)
```

#### (c) Setting the performance data collection interval and the start-time offset

You can set the performance data collection interval (Collection Interval) and collection start-time offset (Collection Offset). To specify these settings, use PFM - Web Console.

The default collection interval of PFM - Agent for Virtual Machine is 60 seconds, whereas the default Interval value of the PFM - RM for Virtual Machine collection process is 300 seconds. If there are problems with the collection interval and offset settings, a KAVL20516-W error is reported.

To avoid this error, make sure that the Interval value does not exceed the Collection Interval value. If the error occurs frequently even when the Interval value does not exceed the Collection Interval value, increase the Collection Interval value or reduce the number of hosts monitored in the instance environment.

For details about the performance data collection interval and offset settings, see the chapter on designing an operation monitoring system in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

For details about the `Interval` setting for the collection process, see [1.3.1 General procedure for performance data collection tasks](#).

## (d) Other necessary settings

Other settings, such as alarm and report definitions, must also be specified. Specify these necessary settings by referring to the settings that were specified during PFM - Agent for Virtual Machine environment setup.

## G.3 Migration in a cluster environment

In a cluster environment, after migration to the executing node finishes, the environment definition file must be copied to the standby node. The procedure is described below. Note that if there are multiple target instances, the procedure must be performed for each instance.

### (1) Making sure that the shared disk is online Executing system

Check whether the shared disk is online. If it is offline, place it online from the cluster software or volume manager.

### (2) Setting up a logical host in the PFM - RM for Virtual Machine environment Executing system

A logical host must first be set up in the PFM - RM for Virtual Machine environment. For details about the setup procedure, see [3. Operations in a Cluster System](#).

### (3) Backing up the source Store database Executing system

If you use method 2 or 3 to migrate the Store database, create a backup file for the Store database of the instance that you want to migrate.

The following is an example of a command line that creates a backup file for the Store database in PFM - Agent for Virtual Machine.

```
C:\Program Files\Hitachi\jplpc\tools> jpctool db backup -id
5Slinst1[aovmhost]
KAVE06000-I Backup processing of the Store database terminated normally.
(service=5Slinst1[aovmhost])
```

### (4) Backing up the destination Store database Executing system

If you perform migration by adding a monitoring target to an existing instance environment, make sure that you back up the Store database of the migration-destination instance. (This is in case of a failure.)

The following is an example of a command line that creates a backup file for the Store database in PFM - RM for Virtual Machine.

```
C:\Program Files\Hitachi\jplpc\tools> jpctool db backup -id
8Slnewinst[rmvmhost]
KAVE06000-I Backup processing of the Store database terminated normally.
(service=8Slnewinst[rmvmhost])
```

## (5) Migrating the environment to the executing node Executing system

Migrate the environment to the executing node for each target instance. The use of the migration command is the same as for migration in a non-cluster environment. Specify logical host names for the `-aolhost` and `-rmlhost` options in the migration command.

## (6) Performing post-migration setup Executing system

After you use the migration command to migrate the Store database, if necessary, specify the network environment settings and the performance data storage destination. The procedures for these tasks are the same as in a non-cluster environment. For details, see [G.2\(4\) Performing post-migration setup](#).

## (7) Exporting the logical host environment definition file Executing system

After environment migration to the executing node finishes, export the logical host environment definitions to a file.

The following is an example of a command line that exports the logical host environment definitions to the `lhostexp.txt` file.

```
C:\Program Files\Hitachi\jplpc\tools>jpcconf ha export -f lhostexp.txt
KAVE05139-I The export processing of the logical host environment
definition file ended normally.
```

## (8) Copying the logical host environment definition file to the standby node Executing system Standby system

The logical host environment definition file that was exported in (7) *Exporting the logical host environment definition file* is now on the executing node. Copy this file from the executing node to the standby node.

## (9) Importing the logical host environment definition file Standby system

The logical host environment definition file that was copied from the executing node is now on the standby node. Use a command to import this file. The following is an example of a command line that imports a logical host environment definition file named `lhostexp.txt`.

```
C:\Program Files\Hitachi\jplpc\tools>jpcconf ha import -f lhostexp.txt
KAVE05140-I The import processing of the logical host environment definition
file ended normally.
```

## (10) Registering PFM - RM for Virtual Machine in the cluster software Executing system Standby system

For details about how to register PFM - RM for Virtual Machine in the cluster software, see [3.3.4 Setup procedure](#).

## G.4 Notes on performing migration

Note the following when performing migration:

- The version of migration-source PFM - Agent for Virtual Machine must be 09-01 or later. If that version is 09-00 or earlier, update it to 09-01 or later. If the backup file to be migrated was created by 09-00 or an earlier version, convert the data model by executing the `jpctool db dmconvert` command.
- The Store version of the PFM - Agent for Virtual Machine instance environment must be 2.0. If the Store version is 1.0, update it to 2.0 by executing the `jpccnf db vrset` command before migration.
- You cannot migrate any backup file created in a PFM - Agent for Virtual Machine instance environment whose Store version is 1.0.
- If the migration-destination PFM - RM for Virtual Machine instance already exists, the `VM_Type` value of the source instance and the `VM_Type` value of the destination instance must match.
- If the `VM_Host` value of the migration-source instance is not 1 through 32 bytes long or has characters other than single-byte alphanumeric characters and hyphens (-), set the `Target Host` value by specifying the `-targethost` option.
- The Store database is larger after migration than before migration. Be careful about this especially when you perform migration by adding monitoring targets to an existing PFM - RM for Virtual Machine instance. Migration is impossible if one of the database files that make up the Store database becomes larger than 2,048 MB.
- To perform migration by adding monitoring targets to an existing PFM - RM for Virtual Machine instance, the directory containing the destination Store database must temporarily have free space that is twice the size of the Store database.
- When migration is performed by adding monitoring targets to an existing PFM - RM for Virtual Machine instance, the destination Store database is backed up automatically by the migration command (rather than manually backed up by `jpctool db backup`). For this reason, migration might take time if the size of the destination Store database is large.
- If you use the `backup2store` or `backup2backup` subcommand to perform migration from a backup directory, check the access control settings of the backup directory specified for the `-aobkpath` option and all files in that directory. Make sure that the access control settings of the directory and files permit reading and writing.
- You can execute multiple instances of the `jpcaovm2rmvm` command concurrently. In this case, do not specify the same PFM - Agent for Virtual Machine instance as the migration source or the same PFM - RM for Virtual Machine instance as the migration destination in multiple commands.
- While the `jpcaovm2rmvm` command is being executed, do not add or change the PFM - RM for Virtual Machine instances or monitoring targets.
- While the `jpcaovm2rmvm` command is being executed, do not use any other commands (such as `jpccnf`, `jpctool`, `jpcctrl`, `jpccsp`, `jpccstart`, and `jpccstop`).
- You cannot execute the `jpcaovm2rmvm` command while the Store service is being backed up or exported.
- If the `jpcaovm2rmvm` command is interrupted by, for example, pressing **Ctrl + C**, invalid instances or monitoring targets might be created. Manually delete any invalid PFM - RM for Virtual Machine instances or monitoring targets that are created.
- If the `jpcaovm2rmvm` command is interrupted by, for example, pressing **Ctrl + C**, an unknown value might be returned. Therefore, if the command is interrupted, ignore the returned value.
- In the following cases, because the performance data for the deleted monitoring target remains in the Store database, you cannot perform migration by specifying the same monitoring target name as the deleted one:
  1. After performance data is collected for a certain period from a monitoring target that was created by the `jpccnf target setup` command, the `jpccnf target unsetup` command is used to delete the monitoring target.
  2. After the `jpcaovm2rmvm` command is used to migrate performance data for a monitoring target, the `jpccnf target unsetup` command is used to delete the monitoring target.

3. The KAVL20479-E message, which reports a Store database migration error, is output while performance data is being migrated by using the `jpcaovm2rmvm` command. Alternatively, an invalid monitoring target that was created during migration is deleted by using the `jpccnf target unsetup` command.

Take one of the following actions:

1. Delete the destination instance environment, and then reperform migration, beginning with instance creation.
  2. Rename the monitoring target, and then re-execute the `jpcaovm2rmvm` command.
  3. Use the `defineonly` subcommand to migrate only definitions, and then use the `jpccnf db import` command to import a backup file that has been migrated by using the `backup2backup` subcommand.
- The default `CollectionInterval` value of PFM - Agent for Virtual Machine is 60 seconds, whereas the default `Interval` value of the PFM - RM for Virtual Machine collection process is 300 seconds. If there are problems with the collection interval and offset settings, a KAVL20516-W error might be output to the shared message log. To avoid this error, make sure that the `Interval` value does not exceed the `CollectionInterval` value. If the error occurs frequently even when the `Interval` value does not exceed the `CollectionInterval` value, increase the `CollectionInterval` value or reduce the number of hosts monitored in the instance environment. For details about the performance data collection interval and offset settings, see the chapter on designing an operation monitoring system in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*. For details about the `Interval` setting for the collection process, see [1.3.1 General procedure for performance data collection tasks](#).
  - Do not redirect the command's standard output. Doing so will output the command execution results including progress information.
  - If you perform migration of a cluster environment by using the `store2store` subcommand, make sure that you specify logical host names for the `-aolhost` and `-rmlhost` options. If you use the `backup2store` or `bacup2backup` subcommand, make sure that you specify the backup directory for the Store database of PFM - Agent for Virtual Machine. In a cluster environment, after you migrate the environment to the executing node, you must copy the environment definition file from the executing node to the standby node. For details about how to copy the environment definition file, see [G.3 Migration in a cluster environment](#).
  - If you want to migrate from the PFM - Agent for Virtual Machine with monitoring VMware with Hyper-Threading enabled, you need to setup and same settings described at [2.1.4\(2\) Setting PFM - RM for Virtual Machine](#).

## G.5 Command reference

The instance environment and monitoring targets of PFM - RM for Virtual Machine are created on the basis of the PFM - Agent for Virtual Machine instance environment, and then the data in the Store database is migrated. The migration-source (PFM - Agent for Virtual Machine) instance environment is not deleted when migration is performed. We recommend that the source instance environment be kept until stable operation of the migration destination (PFM - RM for Virtual Machine) is confirmed. After confirmation, you can delete the source environment.

For Store database migration methods, see [G.1\(2\)\(b\) Migration methods](#).

### (1) Migration command

This subsection describes the permission that is required to execute the migration command. This subsection also describes the format of the command.

Command name

```
jpcaovm2rmvm
```

Execution permission

Administrator permissions

Storage folder

*installation-folder\agt8\tools*

Format

```
jpcaovm2rmvm <subcmd> [-<option> [<value>]]
```

## (2) Subcommands that can be specified in the migration command

The subcommands specified in the migration command select the Store database migration method. The instance definitions and the Store database are migrated according to the selected method. The following describes subcommands that can be specified in the migration command.

### (a) Defineonly

Format

```
defineonly
  -aoinst <PFM - Agent for Virtual Machine instance name>
  -rminst <PFM - RM for Virtual Machine instance name>
  -target <PFM - RM for Virtual Machine monitoring-target-name>
  [-targethost <Target Host>]
  [-aolhost PFM-Agent-for-Virtual-Machine-logical-host-name [-rmlhost
PFM-RM-for-Virtual-Machine-logical-host-name]]
  [-targetadd [-instupdate]]
```

Description

The `defineonly` subcommand migrates only the instance and monitoring target definitions.

Specify this subcommand if you want to start operation of PFM - RM for Virtual Machine without migrating the Store database. You can also specify this subcommand when running both PFM - Agent for Virtual Machine (migration source) and PFM - RM for Virtual Machine (migration destination), and then importing data from the source to the destination.

Notes

- Before you execute the migration command with the `defineonly` subcommand specified, you must stop the service of the migration-target instance.
- If the `-targetadd` option is not specified, the specified instance environment and monitoring target are created when migration is performed.
- If the `-targetadd` option is specified, the specified monitoring target is added to an existing instance environment at the migration destination.

### (b) Store2store

Format

```
store2store
  -aoinst <PFM - Agent for Virtual Machine instance name>
  -rminst <PFM - RM for Virtual Machine instance name>
  -target <PFM - RM for Virtual Machine monitoring-target-name>
  [-targethost <Target Host>]
  [-aolhost PFM-Agent-for-Virtual-Machine-logical-host-name [-rmlhost
```



```
PFM-RM-for-Virtual-Machine-logical-host-name] ]  
  [-targetadd [-instupdate]]  
  [-sizecheck]
```

## Description

The Store database of PFM - Agent for Virtual Machine is directly migrated to the Store database of the PFM - RM for Virtual Machine.

Because direct read and write operations are performed on these Store databases, the services of both the PFM - Agent for Virtual Machine and PFM - RM for Virtual Machine instances must be stopped. For this reason, this method is suited for migration of a small-scale environment.

## Notes

- Before you execute the migration command with the `store2store` subcommand specified, you must stop the services of both the migration-source and migration-target instances.
- If the `-targetadd` option is not specified, the specified instance environment and monitoring target are created when migration is performed.
- If the `-targetadd` option is specified, the specified monitoring target is added to an existing instance environment at the migration destination.

## (c) Backup2store

### Format

```
backup2store  
  -aobkpath PFM-Agent-for-Virtual-Machine's-Store-database-backup-  
directory  
  -rminst <PFM - RM for Virtual Machine instance name>  
  -target PFM-RM-for-Virtual-Machine-monitoring-target-name  
  [-targethost target-host]  
  [-aolhost PFM-Agent-for-Virtual-Machine-logical-host-name [-rmlhost  
PFM-RM-for-Virtual-Machine-logical-host-name]]  
  [-targetadd [-instupdate]]  
  [-sizecheck]
```

## Description

A backup file for the Store database of PFM - Agent for Virtual Machine is created. Then data is migrated from that file to the Store database of PFM - RM for Virtual Machine.

This method is suited when you want to perform migration without stopping the service of the source instance.

## Notes

- Before you execute the migration command with the `backup2store` subcommand specified, you must stop the service of the migration-target instance. (You do not need to stop the service of the migration-source instance.)
- If the `-targetadd` option is not specified, the specified instance environment and monitoring target are created when migration is performed.
- If the `-targetadd` option is specified, the specified monitoring target is added to an existing instance environment at the migration destination.

## (d) Backup2backup

### Format

```
backup2backup  
  -aobkpath PFM-Agent-for-Virtual-Machine's-Store-database-backup-
```

```

directory
  -rmbkpath PFM-RM-for-Virtual-Machine's-Store-database-backup-directory
  -rminst <PFM - RM for Virtual Machine instance name>
  -target PFM-RM-for-Virtual-Machine-monitoring-target-name
  [-aolhost PFM-Agent-for-Virtual-Machine-logical-host-name [-rmlhost
PFM-RM-for-Virtual-Machine-logical-host-name]]

```

## Description

A backup file for the Store database of PFM - Agent for Virtual Machine is created. Then data is migrated from that file to the backup directory of PFM - RM for Virtual Machine.

The data migrated to the backup directory is then imported to PFM - RM for Virtual Machine.

With this method, you do not need to stop the services of the migration-source and migration-destination instances. You can perform migration while both PFM - Agent for Virtual Machine and PFM - RM for Virtual Machine are running concurrently.

## Notes

- You do not need to stop the services of the migration-source and migration-destination instances before executing the migration command with the `backup2backup` subcommand specified.
- Make sure that the instance you specify for the `-rminst` option and the monitoring target you specify for the `-target` option exist before executing the migration command.

## (3) Arguments of the migration commands

This subsection describes the arguments that can be specified in the migration commands.

### (a) Aoinst

#### Format

```
-aoinst <PFM - Agent for Virtual Machine instance name>
```

#### Description

Use this option to specify the name of the migration-source PFM - Agent for Virtual Machine instance. The string that you specify must be 1 through 32 bytes long and can have single-byte alphanumeric characters.

### (b) Aobkpath

#### Format

```
-aobkpath PFM-Agent-for-Virtual-Machine's-Store-database-backup-directory-
path
```

#### Description

Use this option to specify the path of the backup directory for the Store database of the migration-source PFM - Agent for Virtual Machine instance. You can specify either an absolute path or relative path. In both cases, the path length must be 1 through 214 bytes. If you specify a relative path, its actual path (absolute path) must also be 1 through 214 bytes long. When you specify a relative path, the directory that is the current directory when the command is executed is the base directory. You can specify only a directory on the local disk.



## (c) Rmbkpath

### Format

```
-rmbkpath PFM-RM-for-Virtual-Machine's-Store-database-backup-directory-path
```

### Description

Use this option to specify the path of the backup directory for the Store database of the migration-destination PFM - RM for Virtual Machine instance. You can specify either an absolute path or relative path. In both cases, the path length must be 1 through 214 bytes. If you specify a relative path, its actual path (absolute path) must also be 1 through 214 bytes long. When you specify a relative path, the directory that is the current directory when the command is executed is the base directory. You can specify only a directory on the local disk.

### Notes

The migration-destination directory must be empty. If it is not empty, an error occurs.

## (d) Rminst

### Format

```
-rminst <PFM - RM for Virtual Machine instance name>
```

### Description

Use this option to specify the name of the PFM - RM for Virtual Machine instance that you want to create or update, or for which you want to set a monitoring target. The string that you specify must be 1 through 32 bytes long and can have single-byte alphanumeric characters.

### Notes

- To add a monitoring target to an existing instance environment, use the `-targetadd` option, instead of using the `-rminst` option. If you specify the name of an existing instance for the `-rminst` option, an error occurs.
- When you specify an instance for the `-rminst` option of the `backup2backup` subcommand, make sure that the instance exists. If the instance does not exist, an error occurs.

## (e) Target

### Format

```
-target PFM-RM-for-Virtual-Machine-monitoring-target-name
```

### Description

Use this option to specify a string that identifies a monitoring target of the instance. The string that you specify must be 1 through 32 bytes long, and can have single-byte alphanumeric characters and hyphens (-).

### Notes

- If you specify the same name as the name of another monitoring target of the same instance, an error occurs.
- You cannot specify a monitoring target name that begins with a hyphen (-).
- When you specify the `-target` option of the `backup2backup` subcommand, make sure that the instance specified for the `-rminst` option exists. If the instance does not exist, an error occurs.

## (f) Targethost

### Format

```
-targethost <Target Host>
```

### Description

Use this option to specify the name of the monitoring-target host that is the migration destination. The string that you specify must be 1 through 32 bytes long, and can have single-byte alphanumeric characters and hyphens (-).

### Notes

- You cannot specify a monitoring-target host name that begins with a hyphen (-).
- If you omit specifying the monitoring-target host name, the `VM_Host` value of PFM - Agent for Virtual Machine will be used. However, if that value is not 1 through 32 bytes long or that value uses characters that are not single-byte alphanumeric characters or hyphens (-), an error occurs.

## (g) Aolhost

### Format

```
-aolhost PFM-Agent-for-Virtual-Machine-logical-host-name
```

### Description

Use this option to specify the name of the logical host that contains the migration-source PFM - Agent for Virtual Machine instance environment. The string that you specify must be 1 through 32 bytes long, and can have single-byte alphanumeric characters and hyphens (-).

### Notes

- For the value of this option, you cannot specify the string `localhost`, an IP address, or a host name that begins with a hyphen (-).
- The string that you specify cannot include spaces and the following symbols:
  - \ (backslash)
  - / (slash)
  - : (colon)
  - ; (semicolon)
  - \* (asterisk)
  - ? (question mark)
  - " (double quotation mark)
  - <> (angle brackets)
  - | (vertical bar)
  - . (period)
  - = (equal sign)
- If you omit specifying a logical host name, the physical host name will be assumed.

## (h) Rmlhost

### Format

```
-rmlhost PFM-RM-for-Virtual-Machine-logical-host-name
```

## Description

Use this option to specify the name of the PFM - RM for Virtual Machine logical host to which an instance environment will be added. The string that you specify must be 1 through 32 bytes long, and can have single-byte alphanumeric characters and hyphens (-).

## Notes

- For the value of this option, you cannot specify the string `localhost`, an IP address, or a host name that begins with a hyphen (-).
- The string that you specify cannot include spaces and the following symbols:
  - \ (backslash)
  - / (slash)
  - : (colon)
  - ; (semicolon)
  - \* (asterisk)
  - ? (question mark)
  - " (double quotation mark)
  - <> (angle brackets)
  - | (vertical bar)
  - . (period)
  - = (equal sign)
- If you omit specifying a logical host name, the PFM - Agent for Virtual Machine logical host name specified for the `-aolhost` option will be assumed.

## (i) Targetadd

### Format

```
-targetadd
```

## Description

Specify this option to add a monitoring target to an existing PFM - RM for Virtual Machine instance environment.

## Notes

- An attempt to migrate to an existing instance environment without specifying the `-targetadd` option results in an error.
- If the specified instance environment does not exist, an error occurs.
- When adding a monitoring target, make sure that the monitoring target you specify for the `-targetadd` option has not been deleted by using the `jpcconf target unsetup` command. If you specify the name of a deleted monitoring target, migration might fail. Specify a new monitoring target name or a new PFM - RM for Virtual Machine instance when performing migration.

## (j) Instupdate

### Format

```
-instupdate
```

## Description

Specify this option to update the definitions of an existing PFM - RM for Virtual Machine instance environment.

## Notes

- When you specify the `-instupdate` option, you must also specify the `-targetadd` option.
- For the values that you can update, see [G.7 Items that can be migrated when the `-targetadd` and `-instupdate` options are specified](#).

## (k) Sizecheck

### Format

```
-sizecheck
```

### Description

Specify this option to output the results of checking how large the Store database and its backup file will be after migration. After command execution, a message indicating whether migration is possible is output. With the message, the user can determine whether migration is possible.

### Notes

When the migration command is executed without the `-sizecheck` option, migration immediately starts if the Store database will not become so large that migration fails.

## (4) Return values of the migration command

The following table describes the return values of the migration command.

Table G–1: Return values of the migration command

0	The command terminated normally.
1	There are problems with the specified arguments.
2	A user without sufficient permissions attempted to execute the command.
4	The service of the specified PFM - Agent for Virtual Machine or PFM - RM for Virtual Machine instance has not stopped.
5	The service of the specified PFM - Agent for Virtual Machine or PFM - RM for Virtual Machine instance has not been installed.
100	There are problems with the Performance Management environment.
102	The specified logical host has not been set up.
109	The monitoring target settings could not be reported to PFM - RM.
110	The number of monitoring targets has already reached the maximum.
200	Memory is insufficient.
210	Disk capacity is insufficient.
211	A necessary file or directory could not be accessed.
230	Execution of an internal command failed.
231	Registration of the Windows service failed.
240	The specified PFM - Agent for Virtual Machine instance does not exist.
241	The specified PFM - RM for Virtual Machine instance does not exist.
242	The specified PFM - RM for Virtual Machine instance already exists.
243	The <code>VM_Type</code> values of the specified PFM - Agent for Virtual Machine and PFM - RM for Virtual Machine instances do not match.

244	The <code>-targethost</code> option was omitted and the <code>VM_Host</code> value of the specified PFM - Agent for Virtual Machine instance was not 1 through 32 bytes long or included characters that were not single-byte alphanumeric characters or hyphens (-).
245	The specified PFM - RM for Virtual Machine monitoring target does not exist.
246	The specified PFM - RM for Virtual Machine monitoring target already exists.
247	The version of PFM - Agent for Virtual Machine is 09-00 or earlier.
248	One of the database files that make up the Store database will become larger than 2,048 MB after migration.
250	The specified PFM - Agent for Virtual Machine backup directory does not exist.
251	The specified PFM - RM for Virtual Machine backup directory does not exist.
252	The specified PFM - RM for Virtual Machine backup directory is not empty.
254	The Store version of the specified PFM - Agent for Virtual Machine instance is not 2.0. Alternatively, the data model version of that instance is not 4.0.
255	An unexpected error occurred.

## G.6 Property settings of the Collector and Store services

This appendix describes migration of the property settings of the Collector and Store services. Note that there are new properties that exist only in PFM - RM for Virtual Machine (the migration destination). For new properties, either the default values or null strings (for properties without default values) will be set.

### (1) Collector service

The following table describes the Collector service properties that can be checked from PFM - Web Console.

Table G–2: Migration of Collector service properties

No.	PFM - Agent for Virtual Machine (source)			PFM - RM for Virtual Machine (destination)			
	Folder name		Property name	Type	Folder name		Property name
1	Agent Configuration	Agent	VM_Type	Collector service	Remote Monitor Configuration	Remote Monitor	VM_Type
2			HostUserID				HostUserID
3			HostPassword				HostPassword
4			HostDomain				HostDomain
5			Log_Size				Log_Size
6			VM_Host	Remote Agent	Remote Monitor Configuration	Target	Target Host or VM_Host
7			Security				Security
8			Port				Port
9			UserID				UserID
10			Password				Password
11			Domain				Domain
12	Detail Records	<i>record-ID</i>	Log	Remote Agent	Detail Records	<i>record-ID</i>	Log

No.	PFM - Agent for Virtual Machine (source)			PFM - RM for Virtual Machine (destination)			
	Folder name		Property name	Type	Folder name		Property name
13	Detail Records	record-ID	Collection Interval	Collector service	Detail Records	record-ID	Collection Interval
14			Collection Offset				Collection Offset
15			LOGIF				LOGIF
16	Interval Records	record-ID	Log	Remote Agent	Interval Records	record-ID	Log
17			Collection Interval	Collector service			Collection Interval
18			Collection Offset				Collection Offset
19			LOGIF				LOGIF

## (2) Store service

The following table describes the Store service properties that can be checked from PFM - Web Console.

Table G–3: Migration of Store service properties

No.	PFM - Agent for Virtual Machine (source)			PFM - RM for Virtual Machine (destination)			
	Folder name		Property name	Type	Folder name		Property name
1	RetentionEx	Product Interval -<Record>	Period - Minute Drawer (Day)	Store service	RetentionEx	Product Interval	Period - Minute Drawer (Day)
2			Period - Hour Drawer (Day)				Period - Hour Drawer (Day)
3			Period - Day Drawer (Week)				Period - Day Drawer (Week)
4			Period - Week Drawer (Week)				Period - Week Drawer (Week)
5			Period - Month Drawer (Month)				Period - Month Drawer (Month)
6		Product Detail - <Record>	Period (Day)			Product Detail - <Record>	Period (Day)

## G.7 Items that can be migrated when the -targetadd and -instupdate options are specified

The tables below describe the Collector and Store service properties that are migrated when only the -targetadd option is specified and when both the -targetadd and -instupdate options are specified.

Table G–4: Collector service properties that are migrated

PFM - Agent Option for Virtual Machine folder name	Property name	Only -targetadd specified	Both -targetadd and -instupdate specified
Agent Configuration - Agent	VM_Host	Y	Y
	Security	Y	Y
	Port	Y	Y
	UserID	Y	Y
	Password	Y	Y
	Domain	Y	Y
	HostUserID	N	Y
	HostPassword	N	Y
	HostDomain	N	Y
	Log_Size	N	Y
Detail Records - <record>	Log	Y	Y
	Collection Interval	N	Y <sup>#</sup>
	Collection Offset	N	Y
	LOGIF	N	Y
Interval Records - <record>	Log	Y	Y
	Collection Interval	N	Y <sup>#</sup>
	Collection Offset	N	Y
	LOGIF	N	Y

Legend:

Y: Migrated

N: Not migrated

#

PFM - RM Option for Virtual Machine inherits the Collection Interval setting (default: 60 seconds) from PFM - Agent Option for Virtual Machine. If the Collection Interval value is smaller than the Interval value (default: 300 seconds) that was set during instance environment setup, change the Collection Interval value to the Interval value or larger. If only one agent is monitored with the instance, you can also change the Interval value to the Collection Interval value.

Table G–5: Store service properties that are migrated

PFM - Agent Option for Virtual Machine folder name		Property name	Only -targetadd specified	Both -targetadd and -instupdate specified
RetentionEx	Product Interval - <Record>	Period - Minute Drawer (Day)	N	Y
		Period - Hour Drawer (Day)	N	Y
		Period - Day Drawer (Week)	N	Y
		Period - Week Drawer (Week)	N	Y
		Period - Month Drawer (Month)	N	Y
		Period - Year Drawer (Year)	N	N
	Product Detail - <Record>	Period (Day)	N	Y

Legend:

Y: Migrated

N: Not migrated

## G.8 Examples of executing the migration command

This appendix shows examples of executing the migration command in a non-cluster environment. If you execute the command in a cluster environment, add the `-aolhost` and `-rmlhost` options to specify the names of the source and destination logical hosts respectively.

### (1) Migrating only instance and monitoring target definitions

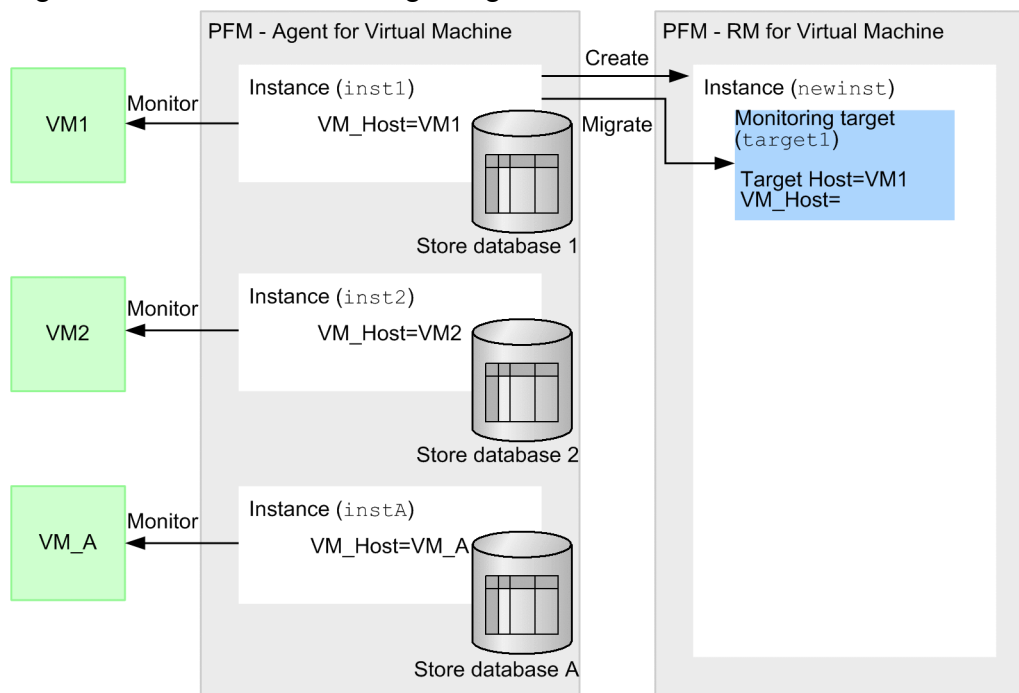
If you want to start operation of PFM - RM for Virtual Machine without migrating the Store database, specify the `defineonly` subcommand. You can also specify this subcommand when running both PFM - Agent for Virtual Machine (the migration source), and PFM - RM for Virtual Machine (the migration destination), and then importing data from the source to the destination.

#### (a) Migrating to a new instance

In this example, you create a new PFM - RM for Virtual Machine instance, and migrate the PFM - Agent for Virtual Machine instance named `inst1` to the new instance. The new instance is named `newinst`, and the instance `inst1` is migrated as `target1`. The following figure shows an overview of this migration.



Figure G–3: Overview of migrating to a new instance



The following shows an example of executing the migration command.

```
C:\Program Files\Hitachi\jplpc\agt8\tools>jpcaovm2rmvm defineonly -aoinst
inst1 -rminst newinst -target target1
KAVL20403-I Start the migration process.
KAVL20400-I The instance was successfully transitioned. (inst1 -> newinst /
target1)
KAVL20401-I If you are changing location of the performance data, JP1 Event
and PFM service automatic restart in the source environment, please review
the target environment.
```

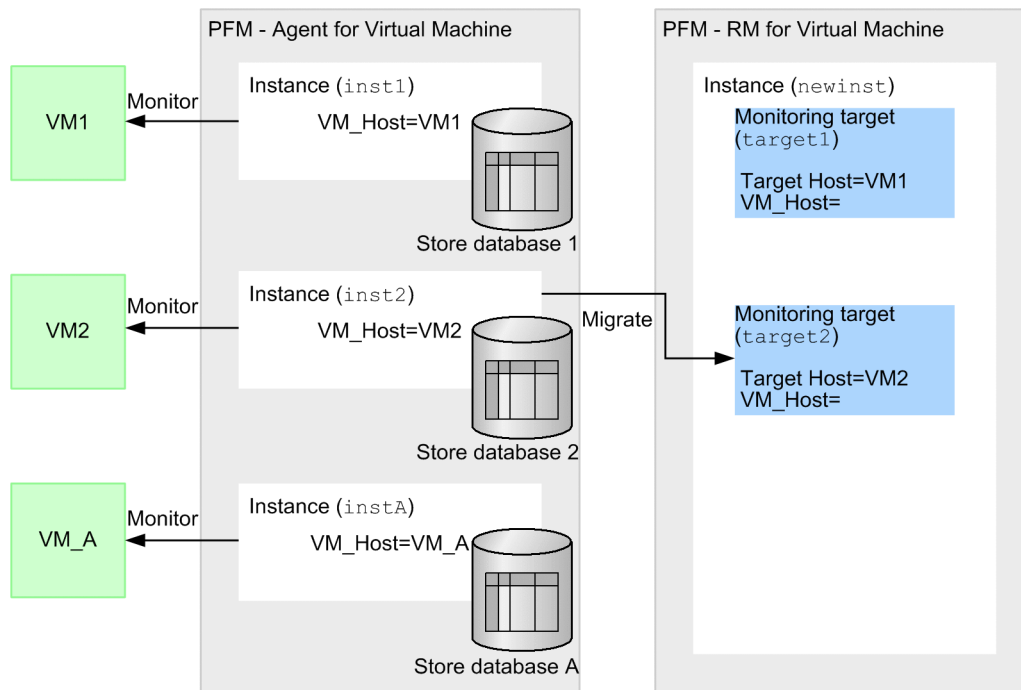
A new PFM - RM for Virtual Machine instance named `newinst` was created, and the environment was migrated to that instance.

### (b) Migrating to an existing instance (add-migration that does not update definitions)

In this example, you migrate a PFM - Agent for Virtual Machine instance to an existing PFM - RM for Virtual Machine instance. The source instance `inst2` is added as `target2` to the destination instance `newinst`. The definitions of the destination (PFM - RM for Virtual Machine) instance are not updated.

The following figure shows an overview of this migration.

Figure G–4: Overview of migrating to an existing instance (add-migration that does not update definitions)



The following shows an example of executing the migration command.

```
C:\Program Files\Hitachi\jplpc\agt8\tools>jpcaovm2rmvm defineonly -aoinst
inst2 -rminst newinst -target target2 -targetadd
KAVL20403-I Start the migration process.
KAVL20400-I The instance was successfully transitioned. (inst2 -> newinst /
target2)
KAVL20402-I If you set the some targets to one instance, please review the
value of 'Collection Interval'.
```

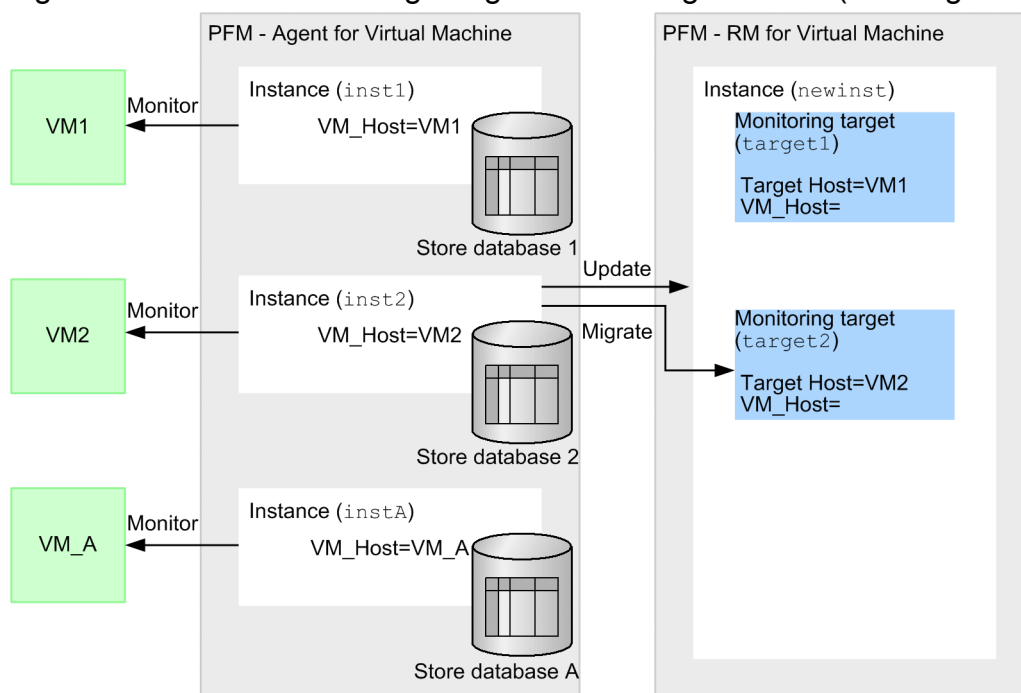
A monitoring target was added to the existing PFM - RM for Virtual Machine instance newinst. In this case, the definitions of this instance have not been updated. For an example of migration that updates the destination instance definitions with the source instance definitions, see [G.8\(1\)\(c\) Migrating to an existing instance \(add-migration that updates definitions\)](#).

### (c) Migrating to an existing instance (add-migration that updates definitions)

In this example, you migrate a PFM - Agent for Virtual Machine instance to an existing PFM - RM for Virtual Machine instance. The definitions of the destination (PFM - RM for Virtual Machine) instance are updated with the definitions of the source (PFM - Agent for Virtual Machine) instance.

The following figure shows an overview of this migration.

Figure G–5: Overview of migrating to an existing instance (add-migration that updates definitions)



The following shows an example of executing the migration command.

```
C:\Program Files\Hitachi\jplpc\agt8\tools>jpcaovm2rmvm defineonly -aoinst
inst2 -rminst newinst -target target2 -targetadd -instupdate
KAVL20403-I Start the migration process.
KAVL20400-I The instance was successfully transitioned. (inst1 -> newinst /
target1)
KAVL20401-I If you are changing location of the performance data, JP1 Event
and PFM service automatic restart in the source environment, please review
the target environment.
KAVL20402-I If you set the some targets to one instance, please review the
value of 'Collection Interval'.
```

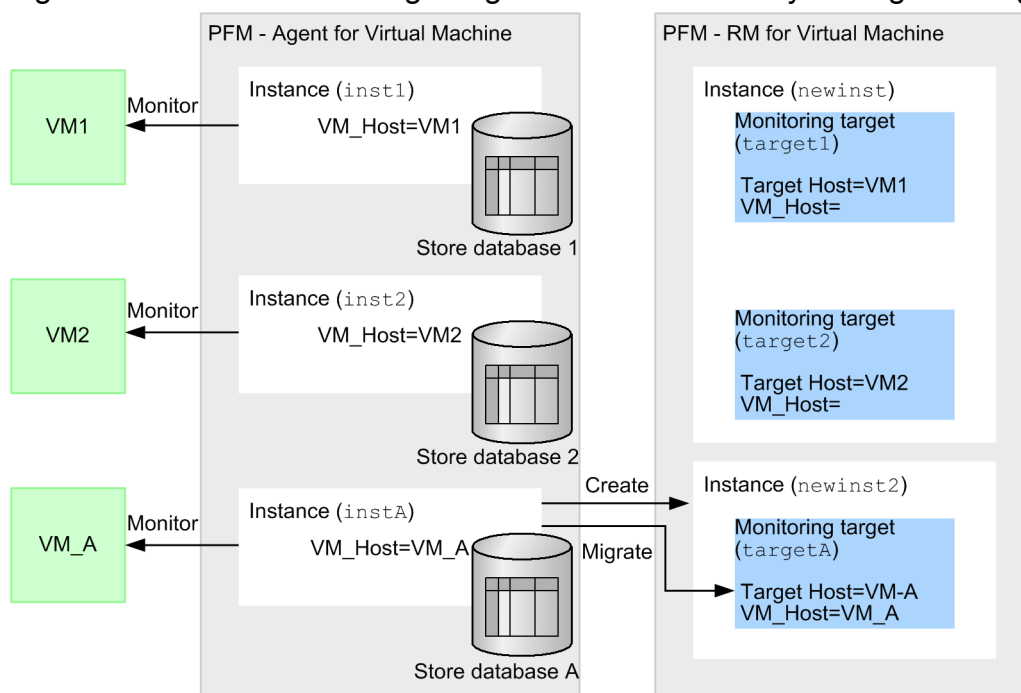
A monitoring target was added to the existing PFM - RM for Virtual Machine instance `newinst`. In this case, the definitions of this instance have been updated with the definitions of the source (PFM - Agent for Virtual Machine) instance. For an example of migration that does not update the destination instance definitions, see [G.8\(1\)\(b\) Migrating to an existing instance \(add-migration that does not update definitions\)](#).

#### (d) Migrating to a new instance by setting the Target Host property

This method is used if the `VM_Host` value of the migration-source (PFM - Agent for Virtual Machine) instance is not 1 through 32 bytes long or includes characters that are not single-byte alphanumeric characters or hyphens (-). In this case, the `Target Host` property must be set for the monitoring target of the PFM - RM for Virtual Machine instance.

In this example, you migrate a source instance whose `VM_Host` value is `VM_A` to a new PFM - RM for Virtual Machine instance by setting the `Target Host` property to `VM-A`. The following figure shows an overview of this migration.

Figure G–6: Overview of migrating to a new instance by setting the Target Host property



The following shows an example of executing the migration command.

```
C:\Program Files\Hitachi\jplpc\agt8\tools>jpcaovm2rmvm defineonly -aoinst
instA -rminst newinst2 -target targetA -targethost VM-A
KAVL20403-I Start the migration process.
KAVL20400-I The instance was successfully transitioned. (instA ->
newinst2 / targetA)
KAVL20401-I If you are changing location of the performance data, JP1 Event
and PFM service automatic restart in the source environment, please review
the target environment.
```

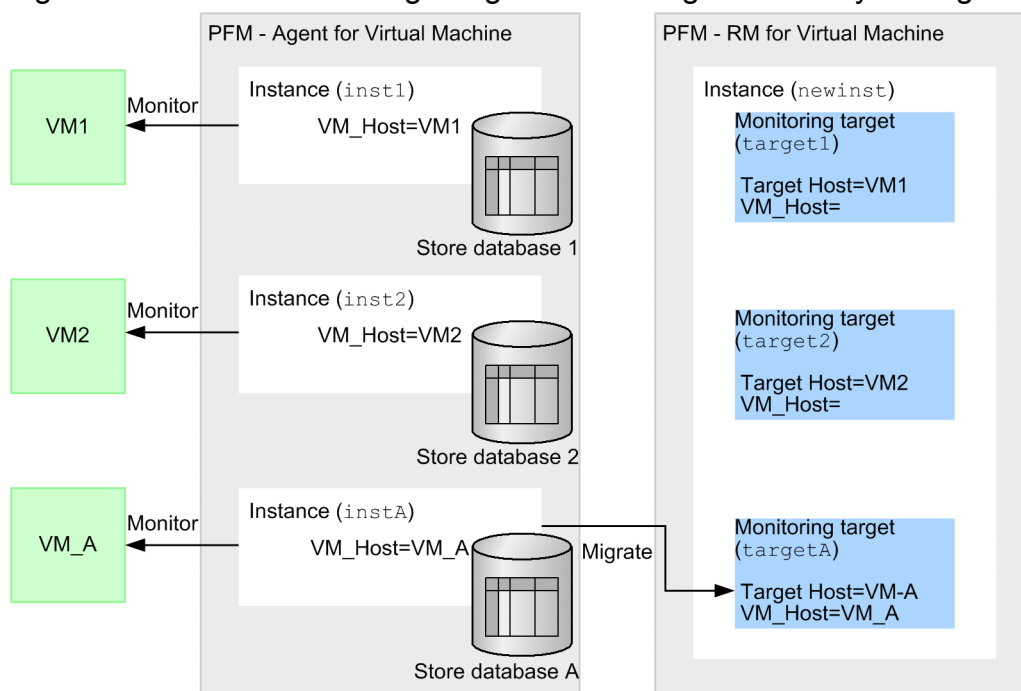
The environment was migrated by setting a Target Host value. Note that you do not need to change the host name of the monitored virtual environment.

### (e) Migrating to an existing instance by setting the Target Host property

This method is used if the VM\_Host value of the migration-source (PFM - Agent for Virtual Machine) instance is not 1 through 32 bytes long or includes characters that are not single-byte alphanumeric characters or hyphens (-). In this case, the Target Host property must be set for the monitoring target of the PFM - RM for Virtual Machine instance.

In this example, you migrate a source instance whose VM\_Host value is VM\_A, adding it to an existing PFM - RM for Virtual Machine instance by setting the Target Host property to VM-A. The following figure shows an overview of this migration.

Figure G-7: Overview of migrating to an existing instance by setting the Target Host property



The following shows an example of executing the migration command.

```
C:\Program Files\Hitachi\jplpc\agt8\tools>jpcaovm2rmvm defineonly -aoinst
instA -rminst newinst -target targetA -targetadd -targethost VM-A
KAVL20403-I Start the migration process.
KAVL20400-I The instance was successfully transitioned. (instA -> newinst /
targetA)
KAVL20401-I If you are changing location of the performance data, JP1 Event
and PFM service automatic restart in the source environment, please review
the target environment.
```

The environment was migrated by setting a Target Host value. Note that you do not need to change the host name of the monitored virtual environment.

## (2) Migrating between Store databases

You can migrate the Store database of a PFM - Agent for Virtual Machine instance directly to the Store database of a PFM - RM for Virtual Machine instance.

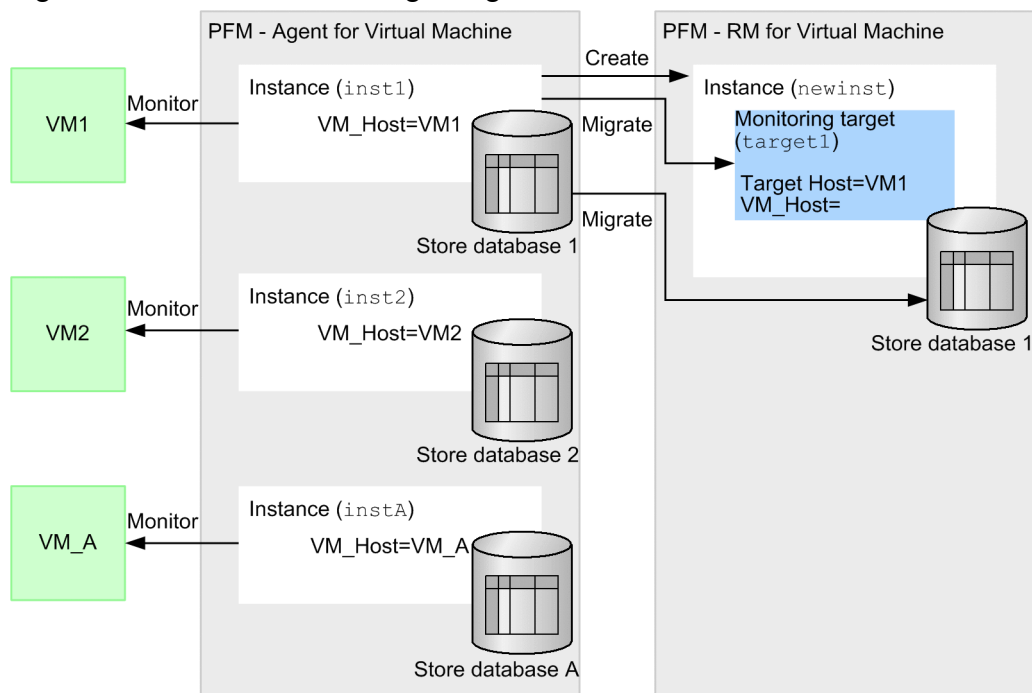
Because the services of the migration source and destination instances must be stopped, this method is suited for migration of a small-scale environment.

To use this method, specify the `store2store` subcommand.

### (a) Migrating to a new instance

In this example, you create a new PFM - RM for Virtual Machine instance, and migrate the PFM - Agent for Virtual Machine instance named `inst1` to the new instance. The new instance is named `newinst`, and the instance `inst1` is migrated as `target1`. The following figure shows an overview of this migration.

Figure G–8: Overview of migrating to a new instance



The following shows an example of executing the migration command.

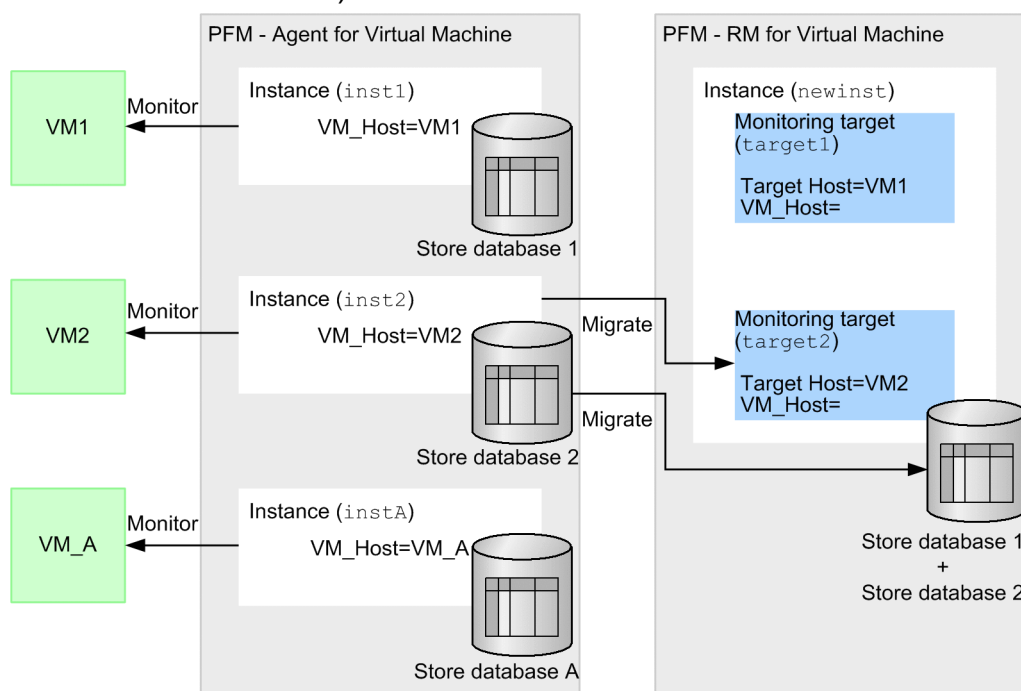
```
C:\Program Files\Hitachi\jplpc\agt8\tools>jpcaovm2rmvm store2store -aoinst
inst1 -rminst newinst -target target1
KAVL20486-I Start to analyze the migration files. (Number of files=100)
100.00 % ( 100 / 100)
KAVL20487-I End to analyze the migration files.
KAVL20403-I Start the migration process.
KAVL20452-I Start to migrate the Store database.
100.00 % ( 500 / 500)
KAVL20453-I End to migrate the Store database.
KAVL20400-I The instance was successfully transitioned. (inst1 -> newinst /
target1)
KAVL20401-I If you are changing location of the performance data, JP1 Event
and PFM service automatic restart in the source environment, please review
the target environment.
```

A new PFM - RM for Virtual Machine instance named `newinst` was created, and the environment was migrated to that instance.

### (b) Migrating to an existing instance (add-migration that does not update definitions)

In this example, you migrate a PFM - Agent for Virtual Machine instance to an existing PFM - RM for Virtual Machine instance. The source instance `inst2` is added as `target2` to the destination instance `newinst`. The definitions of the destination (PFM - RM for Virtual Machine) instance are not updated. The following figure shows an overview of this migration.

Figure G–9: Overview of migrating to an existing instance (add-migration that does not update definitions)



The following shows an example of executing the migration command.

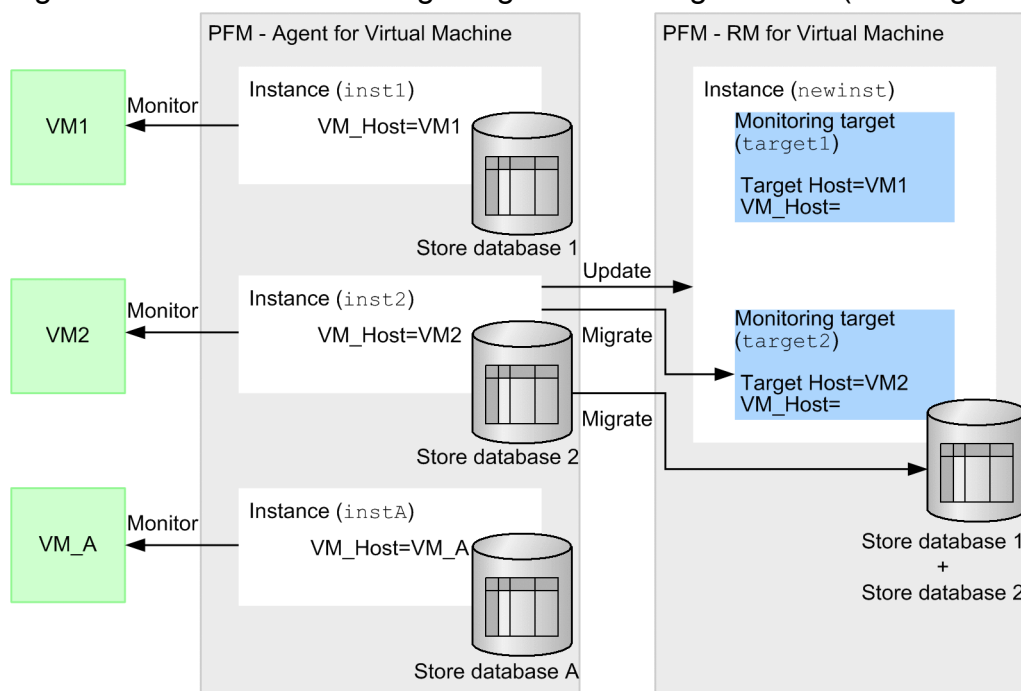
```
C:\Program Files\Hitachi\jplpc\agt8\tools>jpcaovm2rmvm store2store -aoinst
inst2 -rminst newinst -target target2 -targetadd
KAVL20477-I Start to check the store DB size. (Number of files=100)
100.00 % ( 100 / 100)
KAVL20478-I End to check the store DB size.
KAVL20403-I Start the migration process.
KAVL20449-I Start to backup the Store database of the specified PFM - RM
for Virtual Machine.
KAVL20450-I End to backup the Store database of the specified PFM - RM for
Virtual Machine.
KAVL20452-I Start to migrate the Store database.
100.00 % ( 500 / 500)
KAVL20453-I End to migrate the Store database.
KAVL20400-I The instance was successfully transitioned. (inst2 -> newinst /
target2)
KAVL20402-I If you set the some targets to one instance, please review the
value of 'Collection Interval'.
```

A monitoring target was added to the existing PFM - RM for Virtual Machine instance *newinst*. In this case, the definitions of this instance have not been updated. For an example of migration that updates the destination instance definitions with the source instance definitions, see [G.8\(2\)\(c\) Migrating to an existing instance \(add-migration that updates definitions\)](#).

### (c) Migrating to an existing instance (add-migration that updates definitions)

In this example, you migrate a PFM - Agent for Virtual Machine instance to an existing PFM - RM for Virtual Machine instance. The definitions of the destination (PFM - RM for Virtual Machine) instance are updated with the definitions of the source (PFM - Agent for Virtual Machine) instance. The following figure shows an overview of this migration.

Figure G–10: Overview of migrating to an existing instance (add-migration that updates definitions)



The following shows an example of executing the migration command.

```
C:\Program Files\Hitachi\jplpc\agt8\tools>jpcaovm2rmvm store2store -aoinst
inst2 -rminst newinst -target target2 -targetadd -instupdate
KAVL20477-I Start to check the store DB size. (Number of files=100)
100.00 % ( 100 / 100)
KAVL20478-I End to check the store DB size.
KAVL20403-I Start the migration process.
KAVL20449-I Start to backup the Store database of the specified PFM - RM
for Virtual Machine.
KAVL20450-I End to backup the Store database of the specified PFM - RM for
Virtual Machine.
KAVL20452-I Start to migrate the Store database.
100.00 % ( 500 / 500)
KAVL20453-I End to migrate the Store database.
KAVL20400-I The instance was successfully transitioned. (inst2 -> newinst /
target2)
KAVL20401-I If you are changing location of the performance data, JP1 Event
and PFM service automatic restart in the source environment, please review
the target environment.
KAVL20402-I If you set the some targets to one instance, please review the
value of 'Collection Interval'.
```

A monitoring target was added to the existing PFM - RM for Virtual Machine instance `newinst`. In this case, the definitions of this instance have been updated with the definitions of the source (PFM - Agent for Virtual Machine) instance. For an example of migration that does not update the destination instance definitions, see [G.8\(2\)\(b\) Migrating to an existing instance \(add-migration that does not update definitions\)](#).

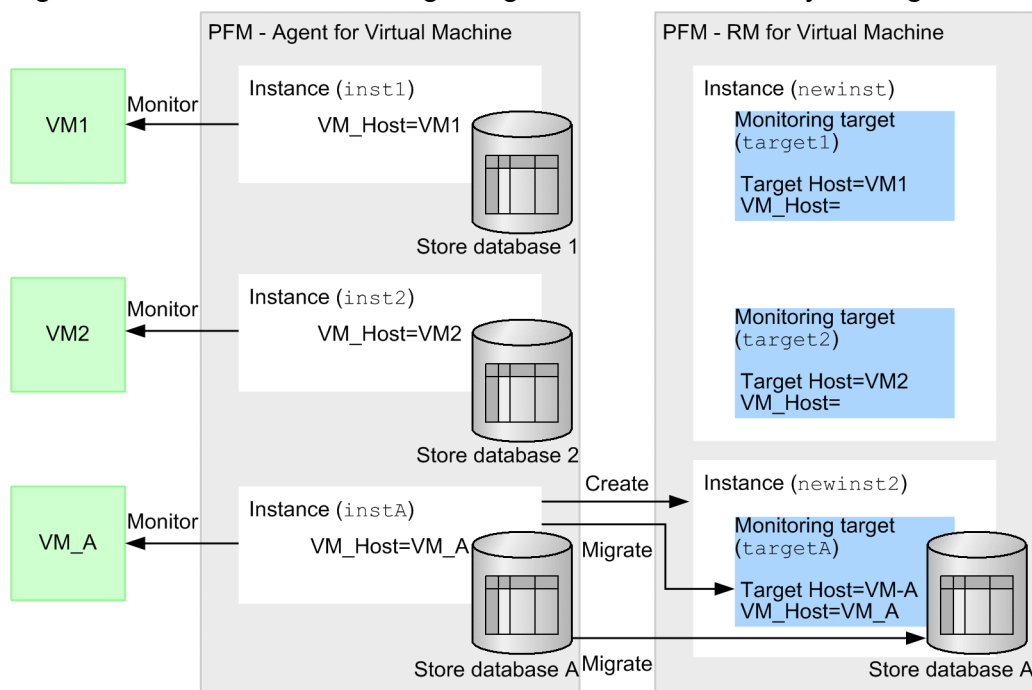


## (d) Migrating to a new instance by setting the Target Host property

This method is used if the `VM_Host` value of the migration-source (PFM - Agent for Virtual Machine) instance is not 1 through 32 bytes long or includes characters that are not single-byte alphanumeric characters or hyphens (-). In this case, the `Target Host` property must be set for the monitoring target of the PFM - RM for Virtual Machine instance.

In this example, you migrate a source instance whose `VM_Host` value is `VM_A` to a new PFM - RM for Virtual Machine instance by setting the `Target Host` property to `VM-A`. The following figure shows an overview of this migration.

Figure G–11: Overview of migrating to a new instance by setting the Target Host property



The following shows an example of executing the migration command.

```
C:\Program Files\Hitachi\jplpc\agt8\tools>jpcaovm2rmvm store2store -aoinst
instA -rminst newinst2 -target targetA -targethost VM-A
KAVL20486-I Start to analyze the migration files. (Number of files=100)
100.00 % ( 100 / 100)
KAVL20487-I End to analyze the migration files.
KAVL20403-I Start the migration process.
KAVL20452-I Start to migrate the Store database.
100.00 % ( 500 / 500)
KAVL20453-I End to migrate the Store database.
KAVL20400-I The instance was successfully transitioned. (instA ->
newinst2 / targetA)
KAVL20401-I If you are changing location of the performance data, JP1 Event
and PFM service automatic restart in the source environment, please review
the target environment.
```

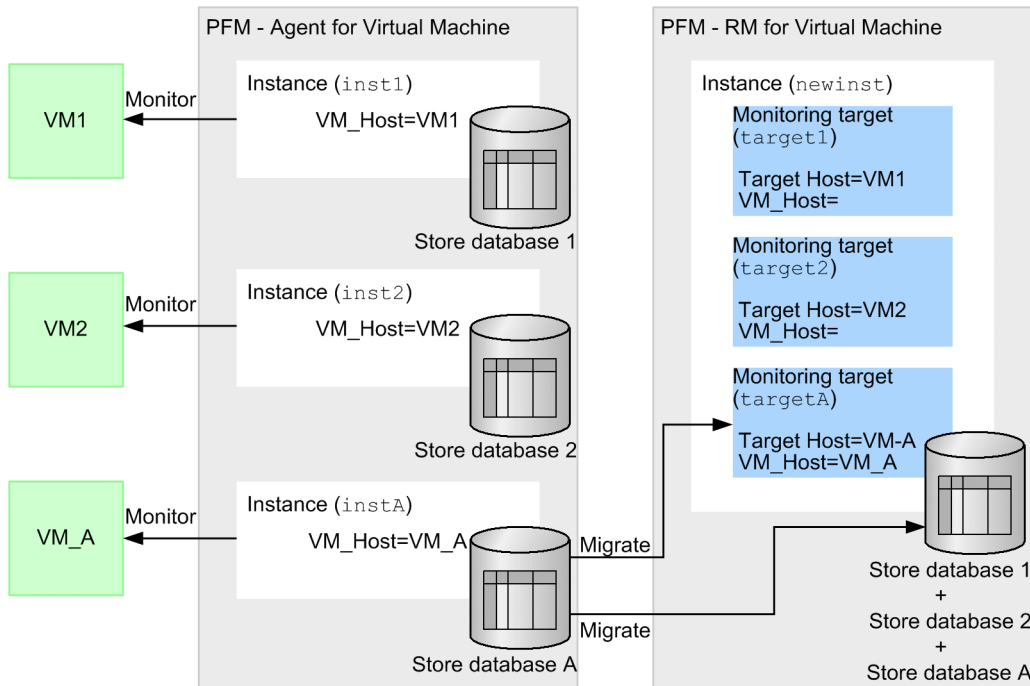
The environment was migrated by setting a `Target Host` value. Note that you do not need to change the host name of the monitored virtual environment.

## (e) Migrating to an existing instance by setting the Target Host property

This method is used if the `VM_Host` value of the migration-source (PFM - Agent for Virtual Machine) instance is not 1 through 32 bytes long or includes characters that are not single-byte alphanumeric characters or hyphens (-). In this case, the `Target Host` property must be set for the monitoring target of the PFM - RM for Virtual Machine instance.

In this example, you migrate a source instance whose `VM_Host` value is `VM_A`, adding it to an existing PFM - RM for Virtual Machine instance by setting the `Target Host` property to `VM-A`. The following figure shows an overview of this migration.

Figure G–12: Overview of migrating to an existing instance by setting the Target Host property



The following shows an example of executing the migration command.

```
C:\Program Files\Hitachi\jplpc\agt8\tools>jpcaovm2rmvm store2store -aoinst
instA -rminst newinst -target targetA -targetadd -targethost VM-A
KAVL20477-I Start to check the store DB size. (Number of files=100)
100.00 % ( 100 / 100)
KAVL20478-I End to check the store DB size.
KAVL20403-I Start the migration process.
KAVL20449-I Start to backup the Store database of the specified PFM - RM
for Virtual Machine.
KAVL20450-I End to backup the Store database of the specified PFM - RM for
Virtual Machine.
KAVL20452-I Start to migrate the Store database.
100.00 % ( 500 / 500)
KAVL20453-I End to migrate the Store database.
KAVL20400-I The instance was successfully transitioned. (instA -> newinst /
targetA)
KAVL20402-I If you set the some targets to one instance, please review the
value of 'Collection Interval'.
```

The environment was migrated by setting a `Target Host` value. Note that you do not need to change the host name of the monitored virtual environment.

### (3) Migrating from a backup file to a Store database

You can first create a backup file for the Store database of PFM - Agent for Virtual Machine, and then migrate data from the backup file to the Store database of PFM - RM for Virtual Machine.

Before starting migration, you must back up the PFM - Agent for Virtual Machine instance that you want to migrate.

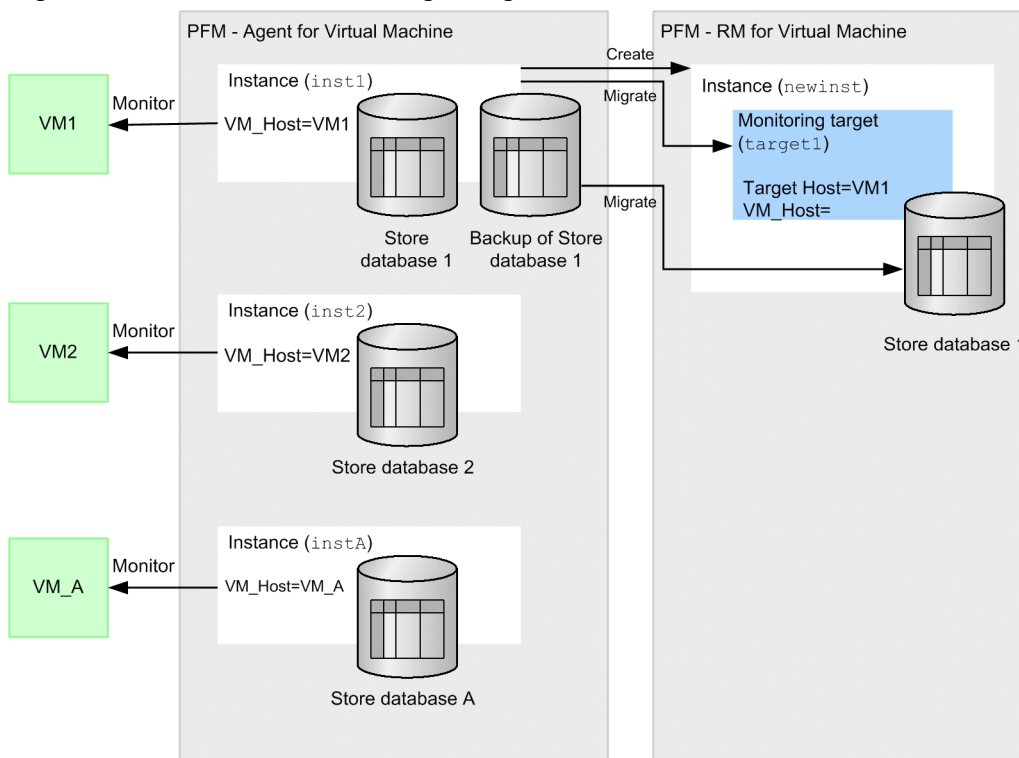
You must stop the service of the migration destination instance, but you do not need to stop the service of the migration source instance.

To use this method, specify the `backup2store` subcommand.

#### (a) Migrating to a new instance

In this example, you create a new PFM - RM for Virtual Machine instance, and migrate the PFM - Agent for Virtual Machine instance named `inst1` to the new instance. The new instance is named `newinst`, and the instance `inst1` is migrated as `target1`. The following figure shows an overview of this migration.

Figure G–13: Overview of migrating to a new instance



Create a backup file for the Store database of the instance that you want to migrate. For an example of creating a backup file, see [G.2\(1\) Backing up the source Store database](#). The following is an example of executing the migration command when a backup file for the Store database is located in `C:\Program Files\Hitachi\jplpc\agt5\store\inst1\backup\01`.

```
C:\Program Files\Hitachi\jplpc\agt8\tools>jpcaovm2rmvm backup2store -
aobkpath
"C:\Program Files\Hitachi\jplpc\agt5\store\inst1\backup\01" -rminst newinst
-target target1
KAVL20486-I Start to analyze the migration files. (Number of files=100)
100.00 % ( 100 / 100)
KAVL20487-I End to analyze the migration files.
```

```

KAVL20403-I Start the migration process.
KAVL20452-I Start to migrate the Store database.
100.00 % (      500 /      500)
KAVL20453-I End to migrate the Store database.
KAVL20400-I The instance was successfully transitioned. (inst1 -> newinst /
target1)
KAVL20401-I If you are changing location of the performance data, JP1 Event
and PFM service automatic restart in the source environment, please review
the target environment.

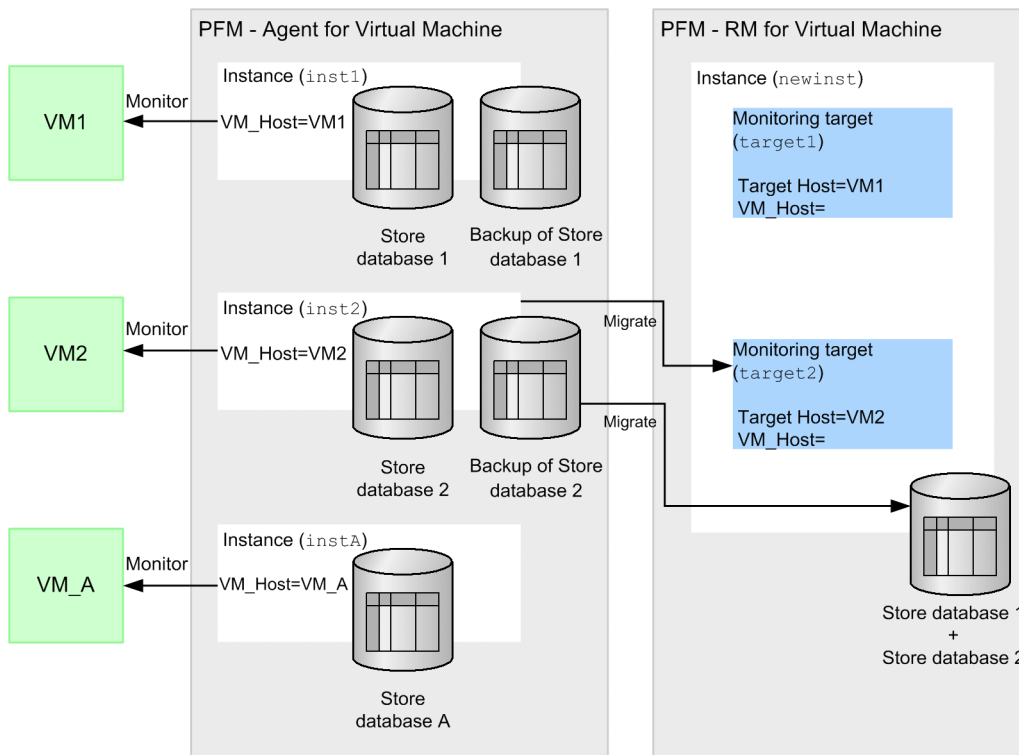
```

A new PFM - RM for Virtual Machine instance named `newinst` was created, and the environment was migrated to that instance.

## (b) Migrating to an existing instance (add-migration that does not update definitions)

In this example, you migrate a PFM - Agent for Virtual Machine instance to an existing PFM - RM for Virtual Machine instance. The source instance `inst2` is added as `target2` to the destination instance `newinst`. The definitions of the destination (PFM - RM for Virtual Machine) instance are not updated. The following figure shows an overview of this migration.

Figure G–14: Overview of migrating to an existing instance (add-migration that does not update definitions)



Create a backup file for the Store database of the instance that you want to migrate. For an example of creating a backup file, see [G.2\(1\) Backing up the source Store database](#). The following is an example of executing the migration command when a backup file for the Store database is located in `C:\Program Files\Hitachi\jp1pc\agt5\store\inst2\backup\01`.

```

C:\Program Files\Hitachi\jp1pc\agt8\tools>jpcaovm2rmvm backup2store -
aobkpath
"C:\Program Files\Hitachi\jp1pc\agt5\store\inst2\backup\01" -rminst newinst
-target target2 -targetadd

```

```

KAVL20477-I Start to check the store DB size. (Number of files=100)
100.00 % ( 100 / 100)
KAVL20478-I End to check the store DB size.
KAVL20403-I Start the migration process.
KAVL20449-I Start to backup the Store database of the specified PFM - RM
for Virtual Machine.
KAVL20450-I End to backup the Store database of the specified PFM - RM for
Virtual Machine.
KAVL20452-I Start to migrate the Store database.
100.00 % ( 500 / 500)
KAVL20453-I End to migrate the Store database.
KAVL20400-I The instance was successfully transitioned. (inst2 -> newinst /
target2)
KAVL20402-I If you set the some targets to one instance, please review the
value of 'Collection Interval'.

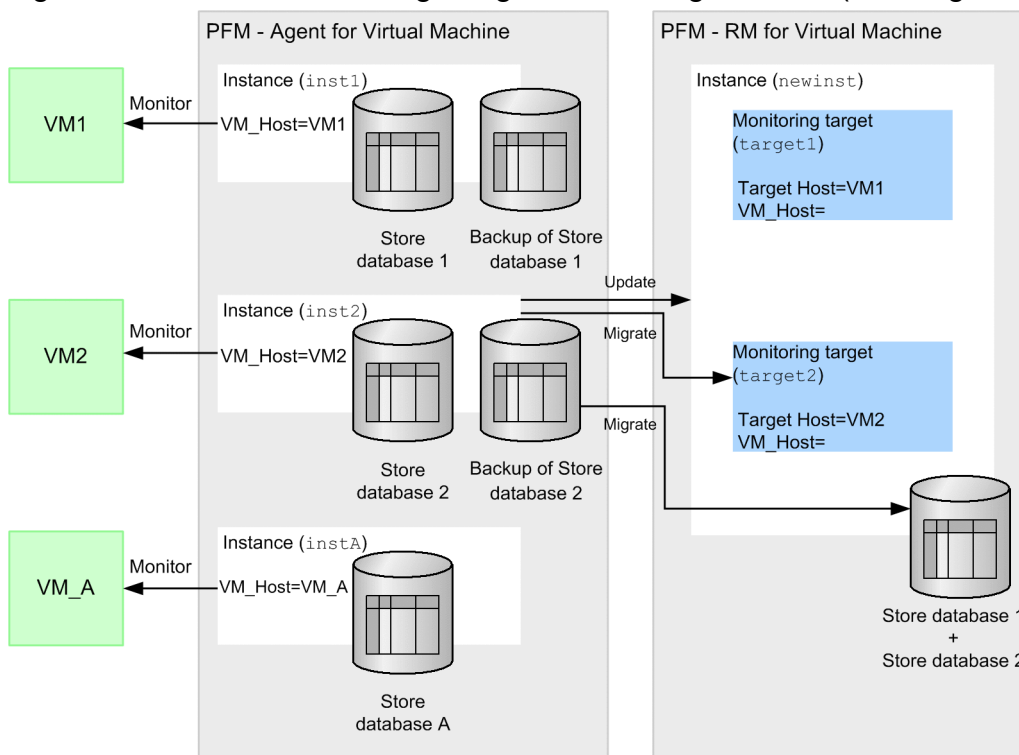
```

A monitoring target was added to the existing PFM - RM for Virtual Machine instance `newinst`. In this case, the definitions of this instance have not been updated. For an example of migration that updates the destination instance definitions with the source instance definitions, see [G.8\(3\)\(c\) Migrating to an existing instance \(add-migration that updates definitions\)](#).

### (c) Migrating to an existing instance (add-migration that updates definitions)

In this example, you migrate a PFM - Agent for Virtual Machine instance to an existing PFM - RM for Virtual Machine instance. The definitions of the destination (PFM - RM for Virtual Machine) instance are updated with the definitions of the source (PFM - Agent for Virtual Machine) instance. The following figure shows an overview of this migration.

Figure G–15: Overview of migrating to an existing instance (add-migration that updates definitions)



Create a backup file for the Store database of the instance that you want to migrate. For an example of creating a backup file, see [G.2\(1\) Backing up the source Store database](#). The following is an example of executing the migration command when a backup file for the Store database is located in `C:\Program Files\Hitachi\jplpc\agt5\store\inst2\backup\01`.

```

C:\Program Files\Hitachi\jplpc\agt8\tools>jpcaovm2rmvm backup2store -
aobkpath
"C:\Program Files\Hitachi\jplpc\agt5\store\inst2\backup\01" -rminst newinst
-target target2 -targetadd -instupdate
KAVL20477-I Start to check the store DB size. (Number of files=100)
100.00 % ( 100 / 100)
KAVL20478-I End to check the store DB size.
KAVL20403-I Start the migration process.
KAVL20449-I Start to backup the Store database of the specified PFM - RM
for Virtual Machine.
KAVL20450-I End to backup the Store database of the specified PFM - RM for
Virtual Machine.
KAVL20452-I Start to migrate the Store database.
100.00 % ( 500 / 500)
KAVL20453-I End to migrate the Store database.
KAVL20400-I The instance was successfully transitioned. (inst2 -> newinst /
target2)
KAVL20401-I If you are changing location of the performance data, JP1 Event
and PFM service automatic restart in the source environment, please review
the target environment.
KAVL20402-I If you set the some targets to one instance, please review the
value of 'Collection Interval'.

```

A monitoring target was added to the existing PFM - RM for Virtual Machine instance `newinst`. In this case, the definitions of this instance have been updated with the definitions of the source (PFM - Agent for Virtual Machine) instance. For an example of migration that does not update the destination instance definitions, see [G.8\(3\)\(b\) Migrating to an existing instance \(add-migration that does not update definitions\)](#).

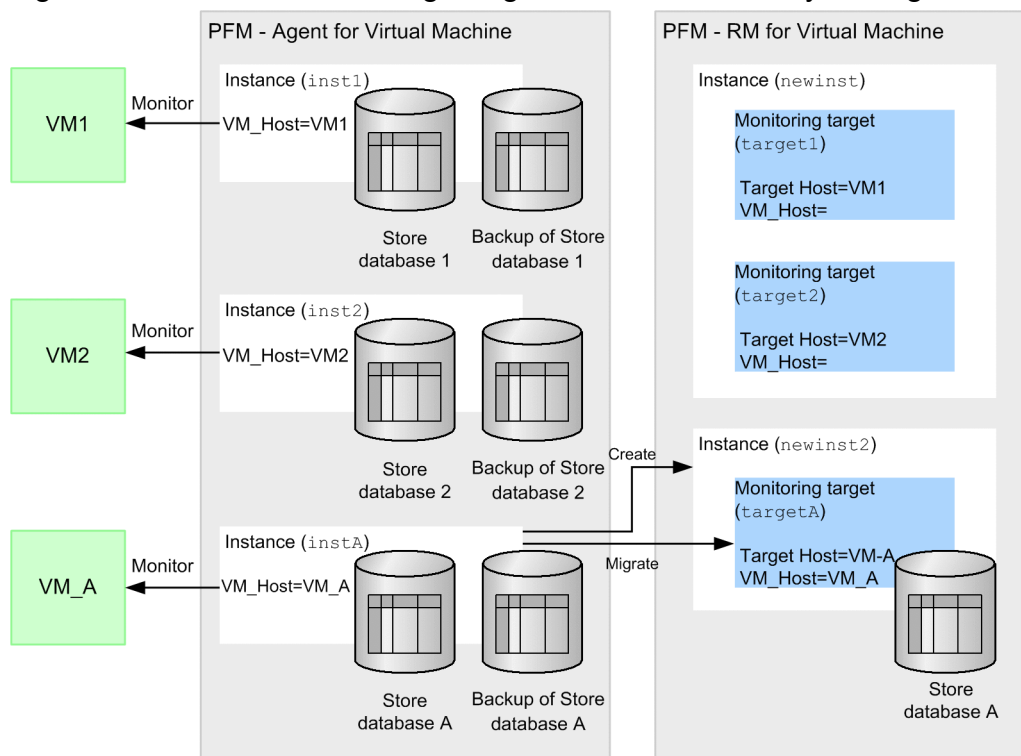
#### (d) Migrating to a new instance by setting the Target Host property

This method is used if the `VM_Host` value of the migration-source (PFM - Agent for Virtual Machine) instance is not 1 through 32 bytes long or includes characters that are not single-byte alphanumeric characters or hyphens (-). In this case, the `Target Host` property must be set for the monitoring target of the PFM - RM for Virtual Machine instance.

In this example, you migrate a source instance whose `VM_Host` value is `VM_A` to a new PFM - RM for Virtual Machine instance by setting the `Target Host` property to `VM-A`. The following figure shows an overview of this migration.



Figure G–16: Overview of migrating to a new instance by setting the Target Host property



Create a backup file for the Store database of the instance that you want to migrate. For an example of creating a backup file, see [G.2\(1\) Backing up the source Store database](#). The following is an example of executing the migration command when a backup file for the Store database named StoreA is located in C:\Program Files\Hitachi\jplpc\agt5\store\instA\backup\01.

```
C:\Program Files\Hitachi\jplpc\agt8\tools>jpcaovm2rmvm backup2store -
aobkpath
"C:\Program Files\Hitachi\jplpc\agt5\store\instA\backup\01" -rminst
newinst2 -target targetA -targethost VM-A
KAVL20486-I Start to analyze the migration files. (Number of files=100)
100.00 % ( 100 / 100)
KAVL20487-I End to analyze the migration files.
KAVL20403-I Start the migration process.
KAVL20452-I Start to migrate the Store database.
100.00 % ( 500 / 500)
KAVL20453-I End to migrate the Store database.
KAVL20400-I The instance was successfully transitioned. (instA ->
newinst2 / targetA)
KAVL20401-I If you are changing location of the performance data, JP1 Event
and PFM service automatic restart in the source environment, please review
the target environment.
```

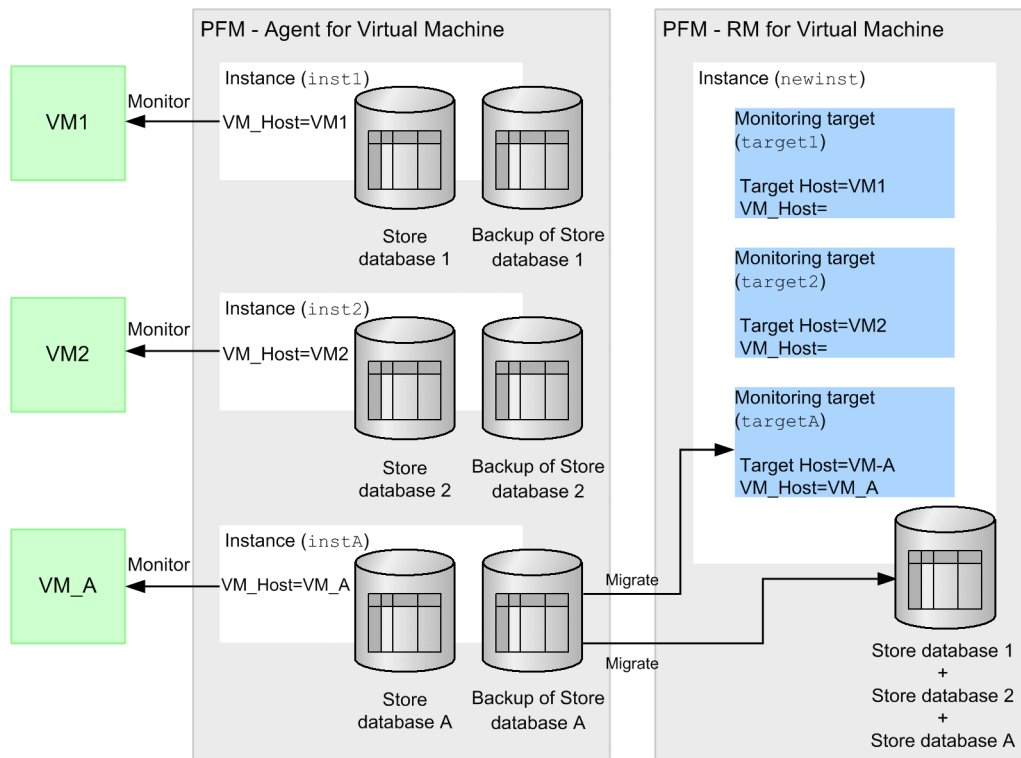
The environment was migrated by setting a Target Host value. Note that you do not need to change the host name of the monitored virtual environment.

### (e) Migrating to an existing instance by setting the Target Host property

This method is used if the VM\_Host value of the migration-source (PFM - Agent for Virtual Machine) instance is not 1 through 32 bytes long or includes characters that are not single-byte alphanumeric characters or hyphens (-). In this case, the Target Host property must be set for the monitoring target of the PFM - RM for Virtual Machine instance.

In this example, you migrate a source instance whose VM\_Host value is VM\_A, adding it to an existing PFM - RM for Virtual Machine by setting the Target Host property to VM-A. The following figure shows an overview of this migration.

Figure G-17: Overview of migrating to an existing instance by setting the Target Host property



Create a backup file for the Store database of the instance that you want to migrate. For an example of creating a backup file, see [G.2\(1\) Backing up the source Store database](#). The following is an example of executing the migration command when a backup file for the Store database named StoreA is located in C:\Program Files\Hitachi\jplpc\agt5\store\instA\backup\01.

```
C:\Program Files\Hitachi\jplpc\agt8\tools>jpcaovm2rmvm backup2store -
aobkpath
"C:\Program Files\Hitachi\jplpc\agt5\store\instA\backup\01" -rminst newinst
-target targetA -targetadd -targethost VM-A
KAVL20477-I Start to check the store DB size. (Number of files=100)
100.00 % ( 100 / 100)
KAVL20478-I End to check the store DB size.
KAVL20403-I Start the migration process.
KAVL20449-I Start to backup the Store database of the specified PFM - RM
for Virtual Machine.
KAVL20450-I End to backup the Store database of the specified PFM - RM for
Virtual Machine.
KAVL20452-I Start to migrate the Store database.
100.00 % ( 500 / 500)
KAVL20453-I End to migrate the Store database.
KAVL20400-I The instance was successfully transitioned. (instA -> newinst /
targetA)
KAVL20402-I If you set the some targets to one instance, please review the
value of 'Collection Interval'.
```



The environment was migrated by setting a `Target Host` value. Note that you do not need to change the host name of the monitored virtual environment.

## (4) Migrating between backup files

You can first create a backup file for the Store database of PFM - Agent for Virtual Machine, and then migrate data from the backup file to the backup directory of PFM - RM for Virtual Machine.

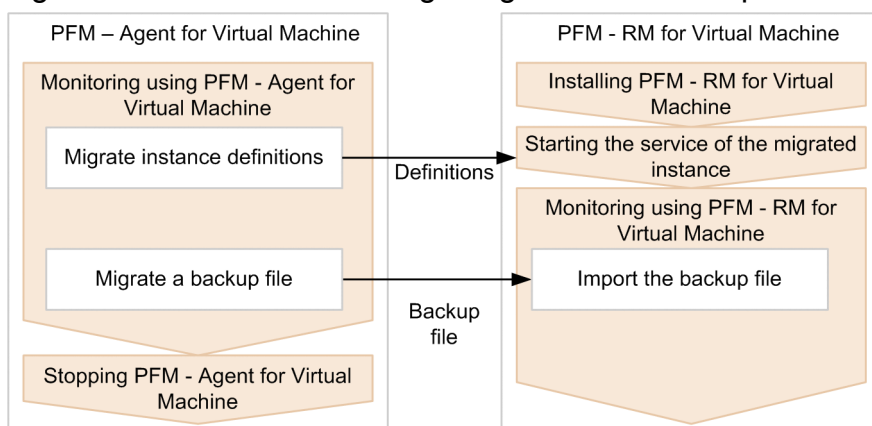
Before starting migration, you must back up the PFM - Agent for Virtual Machine instance that you want to migrate.

You do not need to stop the service of the migration source instance or the migration destination instance.

To use this method, specify the `backup2backup` subcommand.

With this method, you perform migration by importing a backup file. This means that you can perform migration while both the source (PFM - Agent for Virtual Machine) instance and the destination (PFM - RM for Virtual Machine) instance are running. After you have confirmed stable operation of the destination instance, you can migrate and view the contents of the Store database. The following figure shows an overview of this migration.

Figure G–18: Overview of migrating between backup files



Note that if you use this method in which both the source and destination instances are running concurrently, you must perform migration in two stages: instance definition migration and data migration.

First, perform migration of instance definitions. For details about the procedure, see [G.8\(1\) Migrating only instance and monitoring target definitions](#). After this migration succeeds, start the PFM - Agent for Virtual Machine and PFM - RM for Virtual Machine services concurrently. Then, when stable operation of PFM - RM for Virtual Machine is confirmed, proceed to the next stage, data migration.

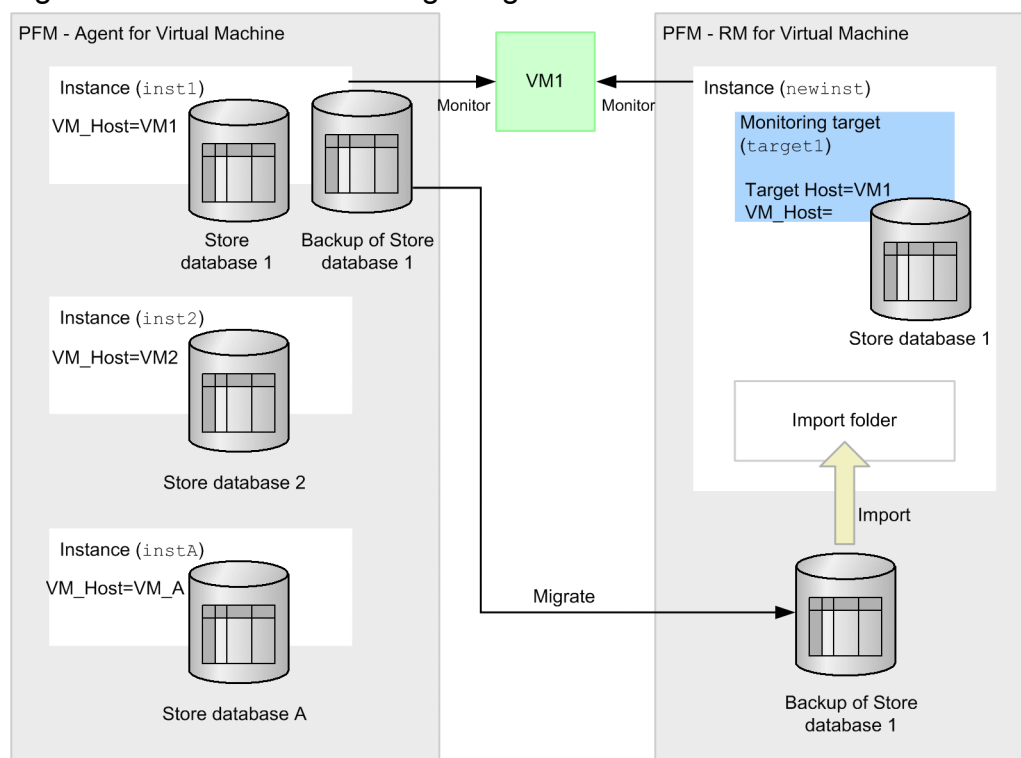
In this stage, you first create a backup file of the Store database on the PFM - Agent for Virtual Machine side, and then perform migration to the backup directory of PFM - RM for Virtual Machine. The following shows an example of this migration.

### (a) Example of executing the migration command with the `backup2backup` subcommand specified

In this example, you migrate a backup file of the PFM - Agent for Virtual Machine instance `inst1` to PFM - RM for Virtual Machine. This example assumes that the monitoring target `target1` has already been created in PFM - RM for Virtual Machine by migrating the instance `inst1`. For details about how to migrate only definitions, see [G.8\(1\) Migrating only instance and monitoring target definitions](#).

The following figure shows an overview of this migration.

Figure G–19: Overview of migrating to a new instance



The following is an example of executing the migration command when a backup file for the Store database named Store1 is located in C:\Program Files\Hitachi\jplpc\agt5\store\inst1\backup\01. Note that the backup directory specified for the `-rmbkpath` option must be empty.

```
C:\Program Files\Hitachi\jplpc\agt8\tools>jpcaovm2rmvm backup2backup -
aobkpath
"C:\Program Files\Hitachi\jplpc\agt5\store\inst1\backup\01" -rmbkpath
"C:\rm4vm\inst1\backup" -rminst newinst -target target1
KAVL20486-I Start to analyze the migration files. (Number of files=100)
100.00 % ( 100 / 100)
KAVL20487-I End to analyze the migration files.
KAVL20403-I Start the migration process.
KAVL20452-I Start to migrate the Store database.
100.00 % ( 500 / 500)
KAVL20453-I End to migrate the Store database.
KAVL20400-I The instance was successfully transitioned. (inst1 -> newinst /
target1)
```

The backup file was migrated to the backup folder of PFM - RM for Virtual Machine.

For the migrated data to be viewed with PFM - RM for Virtual Machine, import the backup file to PFM - RM for Virtual Machine. The following shows a command execution example.

```
C:\Program Files\Hitachi\jplpc\tools\ jpctool db import -key RMVM -inst
newinst -d "C:\rm4vm\inst1\backup" -add
KAVE05841-I Import processing of the Store database will now start.
(servicekey=RMVM, inst=newinst, dir=C:\rm4vm\inst1\backup)
KAVE05842-I Store database import processing ended normally.
(servicekey=RMVM, inst=newinst, dir=C:\rm4vm\inst1\backup)
```

The backup file was imported. The imported data can now be viewed from PFM - RM for Virtual Machine. You can delete the backup file.

## (5) Checking whether the size of a Store database file will exceed 2,048 MB after migration

Because the Store database of PFM - RM for Virtual Machine has a more extended format than the Store database of PFM - Agent for Virtual Machine, the size of the Store database increases after migration. The size of the Store database also increases when multiple instances of PFM - Agent for Virtual Machine are integrated into one instance of PFM - RM for Virtual Machine. Note that migration is impossible if one of the database files that make up the destination Store database becomes larger than 2,048 MB.

You can use the migration command to check whether migration is possible before you perform migration.

To do this, add the `-sizecheck` option when executing the migration command with the `store2store` or `backup2store` subcommand. If this option is specified, the command only checks whether migration is possible, and does not perform migration of definitions, the Store database, or a backup file.

Note that you can specify the `-sizecheck` option only when you perform migration to an existing instance.

The following shows command execution examples:

- If the sizes of no database files will exceed 2,048 MB after migration:

```
C:\Program Files\Hitachi\jplpc\agt8\tools>jpcaovm2rmvm store2store -
aoinst inst1 -rminst newinst -target target1 -targetadd -sizecheck
KAVL20404-I Be calculating of the size of post-migration Store database
(inst1 -> newinst)
KAVL20477-I Start to check the store DB size. (Number of files=100)
100.00 % ( 100 / 100)
KAVL20478-I End to check the store DB size.
KAVL20406-I Finished to calculate size of the Store database. You can do
the migration because Store database capacity after migration is less
than maximum migration capacity.
```

- If the size of at least one database file will exceed 2,048 MB after migration:

```
C:\Program Files\Hitachi\jplpc\agt8\tools>jpcaovm2rmvm store2store -
aoinst inst2 -rminst newinst -target target1 -targetadd -sizecheck
KAVL20404-I Be calculating of the size of post-migration Store database
(inst1 -> newinst)
KAVL20477-I Start to check the store DB size. (Number of files=100)
50.00 % ( 50 / 100)
KAVL20407-I Finished to calculate size of the Store database. You cannot
do the migration because Store database capacity after migration is more
than maximum migration capacity. As destination, please specify a new
instance or another instance with spare Store database.
```

An attempt to migrate the Store database additionally to an existing PFM - RM for Virtual Machine instance fails if the size of a Store database file exceeds 2,048 MB. If the size that a Store database file will have after migration exceeds 2,048 MB, you need to perform migration in another way. For details, see [G.8\(6\) Performing migration if the size of a Store database will exceed 2,048 MB after migration](#).

## (6) Performing migration if the size of a Store database will exceed 2,048 MB after migration

Because the Store database of PFM - RM for Virtual Machine has a more extended format than the Store database of PFM - Agent for Virtual Machine, the size of the Store database increases after migration. The size of the Store database also increases when multiple instances of PFM - Agent for Virtual Machine are integrated into one instance of PFM - RM for Virtual Machine. Note that migration is impossible if one of the database files that make up the destination Store database becomes larger than 2,048 MB.

However, you can ignore the 2,048 MB limitation when migrating a backup file (by executing the migration command with the `backup2backup` subcommand) and importing that file (by using the `jpctool db import` command).

If migration is impossible, try any of the following measures:

- Specify another instance as the migration destination.  
Specify a new instance for the `-rminst` option.  
If you have to specify an existing instance, make sure that the Store database of that instance has sufficient capacity.
- Migrate only definitions without migrating the database.  
If migration of the Store database or a backup file is unnecessary, you can migrate the definitions only. For how to add a monitoring target without updating instance definitions, see [G.8\(1\)\(b\) Migrating to an existing instance \(add-migration that does not update definitions\)](#). For how to add a monitoring target by updating instance definitions, see [G.8\(1\)\(c\) Migrating to an existing instance \(add-migration that updates definitions\)](#).

## (7) Measures to take if the destination disk capacity is insufficient

Migration of the Store database or a backup file from PFM - Agent for Virtual Machine to PFM - RM for Virtual Machine requires more disk space. If migration is impossible because the destination disk does not have sufficient free space, try any of the following measures:

- Secure sufficient free disk space.  
Secure free disk space that is large enough for migration by, for example, deleting unnecessary files or adding a disk.
- Perform migration of only definitions without migrating the database.  
If migration of the Store database or a backup file is unnecessary, you can migrate the definitions only. For how to add a monitoring target without updating instance definitions, see [G.8\(1\)\(b\) Migrating to an existing instance \(add-migration that does not update definitions\)](#). For how to add a monitoring target by updating instance definitions, see [G.8\(1\)\(c\) Migrating to an existing instance \(add-migration that updates definitions\)](#).

## H. Version Compatibility

---

In PFM - RM, there are multiple product versions as well as data model versions.

Because data models maintain upward compatibility, report definitions and alarm definitions created using an earlier version can also be used by a later version.

The table below shows PFM - RM for Virtual Machine version compatibility.

Table H–1: PFM - RM for Virtual Machine version compatibility

PFM - RM for Virtual Machine version	Data model version	Alarm table version of monitoring template
10-00	4.0	10.00

For details about version compatibility, see the version compatibility described in the appendix section of the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

# I. Outputting Action Log Data

Performance Management action logs contain historical information that is output during linkage to alarm functions that are activated when a threshold, such as the system load, is exceeded.

For example, an action log is output when a PFM service starts up or stops, or when the connection status to PFM - Manager changes.

An action log can be output when the version of PFM - Manager or PFM - Base is 08-11 or later.

An action log is a text file that is output in CSV format. By periodically saving the action log and processing it using a spreadsheet program, you can utilize it as analysis data.

An action log is output based on the setting in the `jpccomm.ini` file. This appendix explains the contents of the action logs that are output by PFM - RM for Virtual Machine and PFM - Base, and the settings necessary for outputting action logs.

## I.1 Types of events that are output to action logs

The table below shows the types of events that are output to action logs and the triggers used by PFM - RM for Virtual Machine and PFM - Base for outputting action logs. Types of events refer to the identifiers in action logs that categorize the items that are output to action logs.

Table I-1: Types of events that are output to action logs

Type of event	Explanation	Triggers used by PFM - RM for Virtual Machine and PFM - Base for outputting action logs
StartStop	Event indicating software start or stop	<ul style="list-style-type: none"><li>PFM service start/stop</li><li>Start/stop of the Stand-alone mode</li></ul>
ExternalService	Event indicating the communication result between a JP1 product and an external service Event indicating an occurrence of abnormal communication	Change in the connection status with PFM - Manager
ManagementAction	Event indicating the execution of an important action of a program Event indicating that an action has been executed using another audit category as the trigger	Execution of an automatic action

## I.2 Format for saving action logs

This subsection explains the file format for saving action logs.

There are two types of action log files. The file to which action log data is output is called the *current output file*. If this file becomes full, it is saved to a different file called the *shift file*. The flow for switching action log files follows.

1. Action logs are sequentially output to the current output file `jpcaudit.log`.
2. When the current output file becomes full, the action logs in it are saved in a shift file.

The shift file name consists of the current output file name with a numerical suffix added to it. Whenever the current output file becomes full, the numerical suffix of the shift file name is incremented by 1. In other words, the larger the numerical suffix, the older the log file.

*Example:*

When the current output file `jpcaudit.log` becomes full, its content is saved in the shift file `jpcaudit1.log`.

When the current output file becomes full again, the logs in it are moved to `jpcaudit1.log` and the existing shift file `jpcaudit1.log` is renamed `jpcaudit2.log`.

When the number of log files exceeds the save limit (specified in the `jpccomm.ini` file), the oldest log file is deleted.

3. The current output file is initialized and new action logs are written into it.

To specify whether to output action logs, their output destination, and the number of logs that can be saved, use the `jpccomm.ini` file. For details about how to set up the `jpccomm.ini` file, see [I.4 Settings for outputting action logs](#).

## I.3 Action log output format

Information related to monitored events is output to Performance Management action logs. An action log file is output for each host (physical host or logical host). The output destination hosts for action logs are as follows.

- When a service is executed: Host on which the execution source service is running
- When a command is executed: Host that executed the command

The output format of action logs, their output destination, and output items are explained below.

### (1) Output format

```
CALFHM x.x,output-item-1 = value-1,output-item-2 = value-2,...,output-item-  
n = value-n
```

### (2) Output destination

```
installation-folder\auditlog\
```

You can change the output destination for action logs in the `jpccomm.ini` file. For details about how to set up the `jpccomm.ini` file, see [I.4 Settings for outputting action logs](#).

### (3) Output items

Output items can be divided into the following two categories:

- Common output items  
These are common items that are output by all JP1 products that output action logs.
- Fixed output items  
These are optional items that are output by JP1 products that output action logs.

## (a) Common output items

The table below shows the values that are output to common output items and descriptions of these items. This table also includes items that are output by PFM - Manager and their descriptions.

Table I-2: Common output items in action logs

No.	Output item		Value	Description
	Item name	Attribute name that is output		
1	Common specification identifier	--	CALFHM	Identifier that indicates the action log format
2	Common specification revision number	--	<i>x.x</i>	Revision number for managing action logs
3	Serial number	seqnum	<i>serial-number</i>	Action log record serial number
4	Message ID	msgid	KAVExxxx-x	Product message ID
5	Date/time	date	YYYY-MM-DDThh:mm:ss.sssTZD <sup>#</sup>	Output date/time and time zone of action log
6	Program name	progid	JP1PFM	Name of the program in which the event occurred
7	Component name	compid	<i>service-ID</i>	Name of the component in which the event occurred
8	Process ID	pid	<i>process-ID</i>	Process ID for which the event occurred
9	Location	ocp:host	<ul style="list-style-type: none"> <li><i>host-name</i></li> <li><i>IP-address</i></li> </ul>	Location where the event occurred
10	Event type	ctgry	<ul style="list-style-type: none"> <li>StartStop</li> <li>Authentication</li> <li>ConfigurationAccess</li> <li>ExternalService</li> <li>AnomalyEvent</li> <li>ManagementAction</li> </ul>	Category name for categorizing the events that are output to action logs
11	Event result	result	<ul style="list-style-type: none"> <li>Success (success)</li> <li>Failure (failure)</li> <li>Occurrence (occurrence)</li> </ul>	Event result
12	Subject identification information	subj:pid	<i>process-ID</i>	One of the following types of information: <ul style="list-style-type: none"> <li>Process ID that runs based on user operation</li> <li>Process ID that caused the event</li> <li>User name that caused the event</li> <li>Identification information</li> </ul>
		subj:uid	<i>account-identifier</i> (PFM user/JP1 user)	
		subj:euid	<i>effective-user-ID</i> (OS user)	



No.	Output item		Value	Description
	Item name	Attribute name that is output		
12	Subject identification information	subj:euId	<i>effective-user-ID</i> (OS user)	assigned to users on a 1:1 basis

Legend:

--: None

#

T is a delimiter between date and time.

TZD is a time zone specifier and one of the following is output:

+hh:mm: Indicates that the time is hh:mm ahead of UTC.

-hh:mm: Indicates that the time is hh:mm behind UTC.

Z: Indicates that the time is the same as UTC.

## (b) Fixed output items

The table below shows the values that are output to fixed output items, and descriptions of these items. This table also includes items that are output by PFM - Manager and their descriptions.

Table I-3: Fixed output items in action logs

No.	Output item		Value	Description
	Item name	Attribute name that is output		
1	Object information	obj	<ul style="list-style-type: none"> <li>PFM-RM-service-ID</li> <li>added-deleted-or-updated-user-name (PFM user)</li> </ul>	Target of operation
		obj:table	<i>alarm-table-name</i>	
		obj:alarm	<i>alarm-name</i>	
2	Action information	op	<ul style="list-style-type: none"> <li>Start (start)</li> <li>Stop (stop)</li> <li>Add (add)</li> <li>Update (update)</li> <li>Delete (delete)</li> <li>Change Password (password change)</li> <li>Activate (activate)</li> <li>Inactivate (inactivate)</li> <li>Bind (bind)</li> <li>Unbind (unbind)</li> </ul>	Information on the action that caused the event
3	Permissions information	auth	<ul style="list-style-type: none"> <li>Management user Management</li> <li>Ordinary user Ordinary</li> <li>Windows Administrator</li> <li>UNIX SuperUser</li> </ul>	Permissions information about the user who performed the operation
		auth:mode	<ul style="list-style-type: none"> <li>PFM authentication mode pfm</li> </ul>	Authentication mode of the user who

No.	Output item		Value	Description
	Item name	Attribute name that is output		
3	Permissions information	auth:mode	<ul style="list-style-type: none"> <li>JP1 authentication mode jpl</li> <li>OS user os</li> </ul>	performed the operation
4	Output source location	outp:host	<i>PFM-Manager-host-name</i>	Action log output source host
5	Location that issued the instruction	subjp:host	<ul style="list-style-type: none"> <li><i>login-source-host-name</i></li> <li><i>target-host</i> (only when the jpctool alarm (jpcalarm) command is executed)</li> </ul>	Host that issued the operation instruction
6	Free description	msg	<i>message</i>	Message that is output when an alarm occurs or an automatic action is executed

Depending on the output trigger, some fixed output items are output while others are not, and the content of the output items also varies. Message IDs and the content of fixed output items are explained below for each output trigger.

#### ■ PFM service start/stop (StartStop)

- Output host: Host on which the service is running
- Output component: Service that executes start/stop

Item name	Attribute name	Value
Message ID	msgid	Start: KAVE03000-I Stop: KAVE03001-I
Action information	op	Start: Start Stop: Stop

#### ■ Stand-alone mode start/stop (StartStop)

- Output host: PFM - RM host
- Output component: Remote Monitor Collector service or Remote Monitor Store service

Item name	Attribute name	Value
Message ID	msgid	When the stand-alone mode starts: KAVE03002-I When the stand-alone mode stops: KAVE03003-I

Note 1: Fixed output items are not output.

Note 2: When a service of PFM - RM for Virtual Machine starts, it connects to the PFM - Manager host to register node information and collect the latest alarm definition information. If the service cannot connect to the PFM - Manager host, the service starts in the mode that enables only some functions such as operating information collection (stand-alone mode). In such a case, to indicate the stand-alone mode, message KAVE03002-I is issued. Thereafter, the service tries to connect to PFM - Manager at specified intervals, and if it succeeds in registering the node information and collecting the definition information, it recovers from the stand-alone mode, and message KAVE03003-I is issued. Therefore, based on this action log, you can know that PFM - RM for Virtual Machine has started in an incomplete state as long as messages KAVE03002-I and KAVE03003-I are being issued.

#### ■ Change in the status of connection with PFM - Manager (ExternalService)

- Output host: PFM - RM host
- Output component: Remote Monitor Collector service or Remote Monitor Store service

Item name	Attribute name	Value
Message ID	msgid	Sending of an event to PFM - Manager failed (queuing has started): KAVE03300-I Resending of an event to PFM - Manager was completed: KAVE03301-I

Note 1: Fixed output items are not output.

Note 2: If the Remote Monitor Store service fails to send an event to PFM - Manager, it starts event queuing, and from then on, a maximum of 3 cases are accumulated in the queue for each event. Message KAVE03300-I is issued when sending of the event fails and queuing begins. After the connection with PFM - Manager is restored, when sending of the queued event is completed, message KAVE03301-I is issued. Based on this action log, you can know that sending of the event to PFM - Manager did not succeed on a real-time basis as long as messages KAVE03300-I and KAVE03301-I are being issued.

Note 3: The Remote Monitor Collector service normally sends an event to PFM - Manager via the Remote Monitor Store service. Only when the Remote Monitor Store service is stopped for some reason, the event is sent directly to PFM - Manager. But if sending fails, message KAVE03300-I is issued. In this case, queuing does not start, and therefore message KAVE03301-I is not issued. Based on this action log, you know that there is an event that was not able to be sent to PFM - Manager.

## ■ Execution of automatic action (ManagementAction)

- Output host: Host that executed the action
- Output component: Action Handler service

Item name	Attribute name	Value
Message ID	msgid	Command execution process generation succeeded: KAVE03500-I Command execution process generation failed: KAVE03501-W Email transmission succeeded: KAVE03502-I Email transmission failed: KAVE03503-W
Free description	msg	Command execution: cmd = <i>executed-command-line</i> Email transmission: mailto = <i>destination-mail-address</i>

Note: When a command execution process is successfully generated, message KAVE03500-I is issued. Thereafter, neither a log indicating whether the command was executed nor an execution result log is output to the action log.

## (4) Output example

An action log output example follows.

```
CALFHM 1.0, seqnum = 1, msgid = KAVE03000-I, date = 2007-01-18T22:46:49.682
+ 09:00,
progid = JP1PFM, compid = 8A1host01, pid = 2076,
ocp:host = host01, ctgry = StartStop, result = Occurrence,
subj:pid = 2076,op = Start
```

## I.4 Settings for outputting action logs

Settings for outputting action logs are defined in the `jpccomm.ini` file. If no settings are defined, no action log is output. The settings necessary for outputting action logs and the procedure are described below.

### (1) Setting procedure

To specify the settings for outputting an action log:

1. Stop all PFM services on the host.

2. Use a text editor, for example, to edit the `jpccomm.ini` file.
3. Save and close the `jpccomm.ini` file.

## (2) Details about the `jpccomm.ini` file

Details about the `jpccomm.ini` file follow.

### (a) Storage folder

*installation-folder*

### (b) Format

For the `jpccomm.ini` file, define the following items:

- Whether to output action logs
- Action log output destination
- Number of action logs to be saved
- Action log file size

The specification format follows.

`"item-name" = value`

The table below shows the items to be set.

Table I–4: Items to be set in the `jpccomm.ini` file and their initial values

No.	Item	Explanation
1	[Action Log Section]	Section name. This cannot be changed.
2	Action Log Mode	Specifies whether to output action logs. This item must be specified. <ul style="list-style-type: none"> <li>• Initial value 0 (Do not output action logs.)</li> <li>• Values that can be specified 0 (Do not output action logs.), 1 (Output action logs.)</li> </ul> If any other value is specified, an error message is issued, and no action log is output.
3	Action Log Dir	Specify the output destination for action logs as an absolute path. 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 you specify a path that exceeds the maximum allowable length or the system is unable to access the directory, an error message is output to the common message log and Performance Management will not output action logs. <ul style="list-style-type: none"> <li>• Initial value: Omitted</li> <li>• Value used when this item is omitted (default): On physical hosts: <i>installation-folder</i>\auditlog On logical hosts: <i>environment-directory</i>\jp1pc\auditlog</li> <li>• Available values: Character strings from 1 to 185 bytes in length</li> </ul>

No.	Item	Explanation
4	Action Log Num	<p>Specifies the upper limit for the total number of log files (number of files to be saved). Specify the total for the current output file and shift files.</p> <ul style="list-style-type: none"> <li>Initial value Omitted</li> <li>Value that is used when specification is omitted (default value) 5</li> <li>Value that can be specified An integer between 2 and 10</li> </ul> <p>If a non-numeric character string is specified, an error message is output and the default value of 5 is set.</p> <p>If a value outside the range is specified, an error message is output and an integer between 2 and 10 that is closest to the specified value is set.</p>
5	Action Log Size	<p>Specifies the log file size in kilobytes.</p> <ul style="list-style-type: none"> <li>Initial value Omitted</li> <li>Value that is used when specification is omitted (default value) 2048</li> <li>Value that can be specified An integer between 512 and 2,096,128</li> </ul> <p>If a non-numeric character string is specified, an error message is output and the default value of 2,048 is set.</p> <p>If a value outside the range is specified, an error message is output and an integer between 512 and 2,096,128 that is closest to the specified value is set.</p>

## J. Linkage with JP1/ITSML

The ability to monitor the operating status of PFM - RM for Virtual Machine can be enhanced by linkage with JP1/ITSML.

PFM - RM for Virtual Machine provides some default monitoring items for PFM - Manager. These items are required to enable monitoring with JP1/ITSML.

The table below lists and describes the default monitoring items that PFM - RM for Virtual Machine provides for PFM - Manager.

For multi-instance records, the records whose key values match specified values are collected. For the collection-target keys, see the collection results of the relevant record.

Table J–1: Default monitoring items that PFM - RM for Virtual Machine provides for PFM - Manager

Name displayed in JP1/ITSML	Description	Record (record ID)	Key (PFM - Manager name)	Field name
CPU resource used on the physical server (MHz)	CPU resource used on the physical server (units: MHz)	Host Status (PI)	None	Used
CPU resource available on the physical CPU for executing virtual machines (MHz)	CPU resource available on the physical CPU for executing virtual machines (units: MHz)	VM Status (PI_VI)	VM_ID	Used
Total memory usage (MB)	Total memory usage on the physical server (units: MB)	Host Memory Status (PI_HMI)	None	Total Used
Virtual-machine memory usage (MB)	Virtual-machine memory usage (units: MB)	VM Memory Status (PI_VMI)	VM_ID	Used
Disk usage (MB)	Logical disk usage on the physical server (units: MB)	Host Logical Disk Status (PI_HLDI)	DISK_ID	Used
Virtual-machine disk space usage (MB)	Virtual-machine disk space usage (units: MB)	VM Logical Disk Status (PI_VLDI) <sup>#</sup>	VM_ID DISK_ID	Used

#

If the monitoring target is either Hyper-V or KVM, a hyphen (–) is displayed as the value.

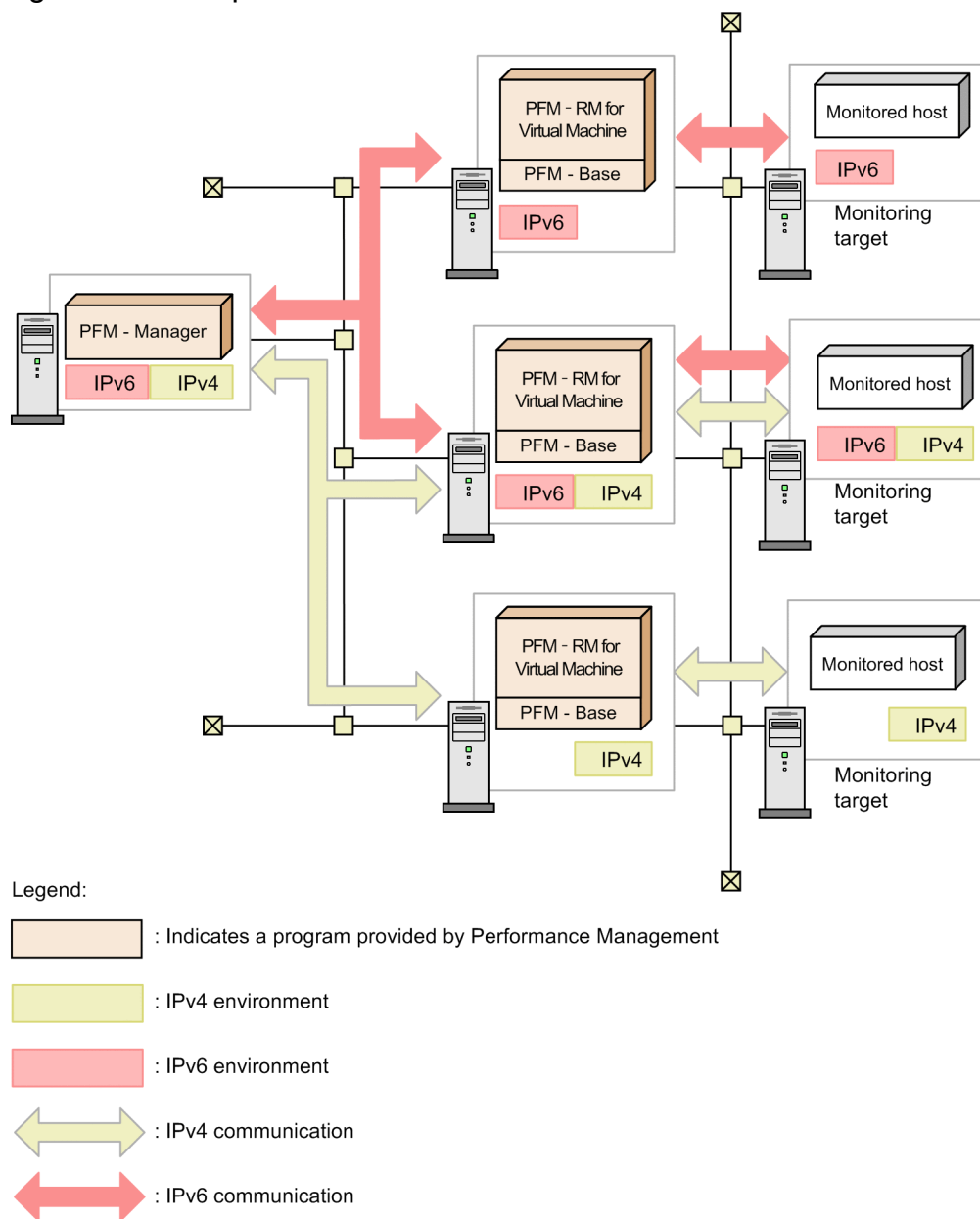
To provide the default monitoring items for PFM - Manager, you must copy a setup file and execute a setup command. For details, see *2.1.4(1) Registering PFM - RM for Virtual Machine*.

## K. About Communication in IPv4 Environments and IPv6 Environments

Performance Management supports network configurations in IPv4 and IPv6 environments. Performance Management is able to operate with a network configuration in which IPv4 and IPv6 environments coexist.

Note that for Performance Management to operate with that network configuration, the OS of the host on which PFM - RM for Virtual Machine is installed must be Windows Server 2008 R2 or Windows Server 2012. In addition, the OS of the host on which PFM - Manager is installed must be Windows Server 2008 R2, Windows Server 2012 or Linux.

Figure K-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*.

## L. Data Sources of the Record

In each fields of the record, the values are stored which have been acquired from the Performance Management or the monitored programs, and calculated these values in some formula. This appendix provides the list of acquisition targets or calculation methods in each fields of the record.

We call these acquisition targets and calculation methods as the data source.

### L.1 In VMware

This section describes the field values of the data sources in VMware.

#### (1) Host CPU Status(PI\_HCI)

The following table lists the data sources in each fields of the Host CPU Status(PI\_HCI) record.

Table L–1: The data sources in each fields of the Host CPU Status(PI\_HCI) record (VMware)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
CPU ID (CPU_ID)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: CPU Objects: Description
CPU Name (CPU_NAME)	VMware vSphere Client Select machine: Host TAB: Configuration Hardware: Processors General: Model
Sampling Time (SAMPLING_TIME)	VMware vSphere Client Select machine: Host TAB: Performance Graph: Time
Clocks (CLOCKS)	VMware vSphere Client Select machine: Host TAB: Configuration Hardware: Processors General: Processor Speed
Used (USED)	$CLOCKS * (USED\_PERCENT / 100)$
Unused (UNUSED)	$CLOCKS - USED$



PFM - View name (PFM - Manager name)	Data Sources
Used % (USED_PERCENT)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: CPU Counters: Description: Usage, Internal Name: usage
Unused % (UNUSED_PERCENT)	100 - USED_PERCENT

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (2) Host Logical Disk Status(PI\_HLDI)

The following table lists the data sources in each fields of the Host Logical Disk Status(PI\_HLDI) record.

**Table L–2: The data sources in each fields of the Host Logical Disk Status(PI\_HLDI) record (VMware)**

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
Disk ID (DISK_ID)	VMware vSphere Client Select machine: Host TAB: Configuration Hardware: Storage Datastores: Identification
Sampling Time (SAMPLING_TIME)	VMware vSphere Client Select machine: Host TAB: Performance Graph: Time
Size (SIZE)	VMware vSphere Client Select machine: Host TAB: Configuration Hardware: Storage Datastores: Capacity
Used (USED)	SIZE - FREE
Free (FREE)	VMware vSphere Client Select machine: Host TAB: Configuration Hardware: Storage Datastores: Free
Used % (USED_PERCENT)	(USED / SIZE) * 100

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

### (3) Host Memory Status(PI\_HMI)

The following table lists the data sources in each fields of the Host Memory Status(PI\_HMI) record.

Table L–3: The data sources in each fields of the Host Memory Status(PI\_HMI) record (VMware)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
Size (SIZE)	VMware vSphere Client Select machine: Host TAB: Configuration Hardware: Memory Physical: Total
Sampling Time (SAMPLING_TIME)	VMware vSphere Client Select machine: Host TAB: Performance Graph: Time
Used (USED)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: Memory Counters: Description: Consumed, Internal Name: consumed
VMM Used (VMM_USED)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: Memory Counters: Description: Used by VMkernel, Internal Name: sysUsage
VM Used (VM_USED)	USED - VMM_USED
Unused (UNUSED)	SIZE - USED
VM Swap Used (VM_SWAP_USED)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: Memory Counters: Description: Balloon, Internal Name: vmmemctl
Host Swap Used (HOST_SWAP_USED)	VMware vSphere Client Select machine: Host TAB: Performance

PFM - View name (PFM - Manager name)	Data Sources
Host Swap Used (HOST_SWAP_USED)	Chart Options: Memory Counters: Description: Swap Used, Internal Name: swapused
Total Used (TOTAL_USED)	USED + VM_SWAP_USED + HOST_SWAP_USED
Used % (USED_PERCENT)	(USED / SIZE) * 100
VMM Used % (VMM_USED_PERCENT)	(VMM_USED / SIZE) * 100
VM Used % (VM_USED_PERCENT)	(VM_USED / SIZE) * 100
VM Swap Used % (VM_SWAP_USED_PERCENT)	(VM_SWAP_USED / SIZE) * 100
Host Swap Used % (HOST_SWAP_USED_PERCENT)	(HOST_SWAP_USED / SIZE) * 100
Total Used % (TOTAL_USED_PERCENT)	(TOTAL_USED / SIZE) * 100
Swap IO (SWAP_IO)	SWAP_IN_IO + SWAP_OUT_IO
Swap In IO (SWAP_IN_IO)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: Memory Counters: Description: Swap in, Internal Name: swapin
Swap Out IO (SWAP_OUT_IO)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: Memory Counters: Description: Swap Out, Internal Name: swapout

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (4) Host Network Status(PI\_HNI)

The following table lists the data sources in each fields of the Host Network Status(PI\_HNI) record.

Table L–4: The data sources in each fields of the Host Network Status(PI\_HNI) record (VMware)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
Net ID (NET_ID)	VMware vSphere Client

PFM - View name (PFM - Manager name)	Data Sources
Net ID (NET_ID)	Select machine: Host TAB: Performance Chart Options: Network Objects: Description
Sampling Time (SAMPLING_TIME)	VMware vSphere Client Select machine: Host TAB: Performance Graph: Time
Rate (RATE)	SEND_RATE + RECV_RATE
Send Rate (SEND_RATE)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: Network Counters: Description: Data transmit rate, Internal Name: transmitted
Recv Rate (RECV_RATE)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: Network Counters: Description: Data receive rate, Internal Name: received

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (5) Host Physical Disk Status(PI\_HPDI)

The following table lists the data sources in each fields of the Host Physical Disk Status(PI\_HPDI) record.

**Table L–5: The data sources in each fields of the Host Physical Disk Status(PI\_HPDI) record (VMware)**

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
Disk ID (DISK_ID)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: Disk Objects: Description
Sampling Time (SAMPLING_TIME)	VMware vSphere Client Select machine: Host TAB: Performance

PFM - View name (PFM - Manager name)	Data Sources
Sampling Time (SAMPLING_TIME)	Graph: Time
Speed (SPEED)	READ_SPEED + WRITE_SPEED
Read Speed (READ_SPEED)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: Disk Counters: Description: Read rate, Internal Name: read
Write Speed (WRITE_SPEED)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: Disk Counters: Description: Write rate, Internal Name: write
Requests (REQUESTS)	READ_REQUESTS + WRITE_REQUESTS
Read Requests (READ_REQUESTS)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: Disk Counters: Description: Read requests, Internal Name: numberRead
Write Requests (WRITE_REQUESTS)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: Disk Counters: Description: Write requests, Internal Name: numberWrite
Commands (COMMANDS)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: Disk Counters: Description: Commands issued, Internal Name: commands
Abort Commands (ABORT_COMMANDS)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: Disk Counters: Description: Command aborted, Internal Name: commandsAborted
Abort Commands % (ABORT_COMMANDS_PERCENT)	(ABORT_COMMANDS / COMMANDS) * 100
Bus Resets (BUS_RESETS)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: Disk

PFM - View name (PFM - Manager name)	Data Sources
Bus Resets (BUS_RESETS)	Counters: Description: Bus resets, Internal Name: busResets

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (6) Host Status Detail(PD)

The following table lists the data sources in each fields of the Host Status Detail(PD) record.

Table L–6: The data sources in each fields of the Host Status Detail(PD) record (VMware)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
Status (STATUS)	--
Host Name (HOST_NAME)	Setting for monitored VM_Host parameter
Reason (REASON)	--
Product (PRODUCT)	VMware vSphere Client Select machine: Host Main Window: Upper side of tab view
VM Count (VM_COUNT)	VMware vSphere Client Select machine: Host TAB: Virtual Machines Number of Virtual Machines
VM Active (VM_ACTIVE)	VMware vSphere Client Select machine: Host TAB: Virtual Machines Number of Virtual Machines which State is Powered On.

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (7) Host Status(PI)

The following table lists the data sources in each fields of the Host Status(PI) record.

**Table L–7: The data sources in each fields of the Host Status(PI) record (VMware)**

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
Clocks (CLOCKS)	<p>[In case of UseHTPhysicalClocks=N in jpcagt8cfg.ini]            VMware vSphere Client            Select machine: Host            TAB: Summary            General: Logical Processors x Frequency of CPU Cores</p> <p>[In case of UseHTPhysicalClocks=Y in jpcagt8cfg.ini]            VMware vSphere Client            Select machine: Host            TAB: Summary            Resources: Capacity</p>
Count (COUNT)	VMware vSphere Client Select machine: Host TAB: Summary General: CPU Cores
Sampling Time (SAMPLING_TIME)	VMware vSphere Client Select machine: Host TAB: Performance Graph: Time
Used (USED)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: CPU Counters: Description: Usage in MHz, Internal Name: usagemhz
VMM Used (VMM_USED)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: System Object: ESX3.0: host/system and host/nursery ESX3.5 or later, ESXi3.5 or later: host/system and host/vim Counters: Description: Resource CPU usage (Average), Internal Name: resourceCpuUsage
VM Used (VM_USED)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: System Object: host/user

PFM - View name (PFM - Manager name)	Data Sources
VM Used (VM_USED)	Counters: Description: Resource CPU usage (Average), Internal Name: resourceCpuUsage
VMM Console Used (VMM_CONSOLE_USED)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: System Object: ESX3.0: host/system/console ESX3.5 and ESX4.x: host/vim/console Counters: Description: Resource CPU usage (Average), Internal Name: resourceCpuUsage ESXi is not supported (always 0)
VMM Kernel Used (VMM_KERNEL_USED)	VMware vSphere Client Select machine: Host TAB: Performance Chart Options: System Object: host/system/kernel Counters: Description: Resource CPU usage (Average), Internal Name: resourceCpuUsage
VMM Others Used (VMM_OTHERS_USED)	VMM_USED - VMM_CONSOLE_USED - VMM_KERNEL_USED
Unused (UNUSED)	CLOCKS - USED
Used % (USED_PERCENT)	USED / CLOCKS * 100
VMM Used % (VMM_USED_PERCENT)	VMM_USED / CLOCKS * 100
VM Used % (VM_USED_PERCENT)	VM_USED / CLOCKS * 100
VMM Console Used % (VMM_CONSOLE_USED_PERCENT)	VMM_CONSOLE_USED / CLOCKS * 100
VMM Kernel Used % (VMM_KERNEL_USED_PERCENT)	VMM_KERNEL_USED / CLOCKS * 100
VMM Others Used % (VMM_OTHERS_USED_PERCENT)	VMM_OTHERS_USED / CLOCKS * 100
Unused % (UNUSED_PERCENT)	UNUSED / CLOCKS * 100

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (8) VM CPU Status(PI\_VCI)

The following table lists the data sources in each fields of the VM CPU Status(PI\_VCI) record.



**Table L–8: The data sources in each fields of the VM CPU Status(PI\_VCI) record (VMware)**

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
VM ID (VM_ID)	--
CPU ID (CPU_ID)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: CPU Objects: Description
VM Host Name (VM_HOST_NAME)	VMware vSphere Client Select machine: Virtual Machine TAB: Summary General: DNS Name
VM Name (VM_NAME)	VMware vSphere Client Select machine: Virtual Machine Main Window: Upper side of tab view
Sampling Time (SAMPLING_TIME)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Graph: Time
Used (USED)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: CPU Counters: Description: Usage in MHz, Internal Name: usagemhz
Insufficient (INSUFFICIENT)	$USED / USED\_PERCENT * INSUFFICIENT\_PERCENT$
Request (REQUEST)	$USED + INSUFFICIENT$
Used % (USED_PERCENT)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: CPU Counters: Description: Used, Internal Name: used
Insufficient % (INSUFFICIENT_PERCENT)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: CPU Counters: Description: Ready, Internal Name: ready

PFM - View name (PFM - Manager name)	Data Sources
Request % (REQUEST_PERCENT)	USED_PERCENT + INSUFFICIENT_PERCENT
Used Per Request (USED_PER_REQUEST)	USED / REQUEST * 100
Insufficient Per Request (INSUFFICIENT_PER_REQUEST)	INSUFFICIENT / REQUEST * 100

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (9) VM Logical Disk Status(PI\_VLDI)

The following table lists the data sources in each fields of the VM Logical Disk Status(PI\_VLDI) record.

**Table L–9: The data sources in each fields of the VM Logical Disk Status(PI\_VLDI) record (VMware)**

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
VM ID (VM_ID)	--
Disk ID (DISK_ID)	VMware vSphere Client Select machine: Virtual Machine TAB: Console A drive name or a mount position displayed on the Guest OS
VM Host Name (VM_HOST_NAME)	VMware vSphere Client Select machine: Virtual Machine TAB: Summary General: DNS Name
VM Name (VM_NAME)	VMware vSphere Client Select machine: Virtual Machine Main Window: Upper side of tab view
Sampling Time (SAMPLING_TIME)	VMware vSphere Client Select machine: Host TAB: Performance Graph: Time
Size (SIZE)	VMware vSphere Client Select machine: Virtual Machine TAB: Console Capacity of the drive displayed on the Guest OS
Used (USED)	SIZE - FREE
Free (FREE)	VMware vSphere Client Select machine: Virtual Machine TAB: Console

PFM - View name (PFM - Manager name)	Data Sources
Free (FREE)	Free space of the drive displayed on the Guest OS
Used % (USED_PERCENT)	(USED / SIZE) * 100

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (10) VM Memory Status(PI\_VMI)

The following table lists the data sources in each fields of the VM Memory Status(PI\_VMI) record.

Table L–10: The data sources in each fields of the VM Memory Status(PI\_VMI) record (VMware)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
VM ID (VM_ID)	--
VM Host Name (VM_HOST_NAME)	VMware vSphere Client Select machine: Virtual Machine TAB: Summary General: DNS Name
VM Name (VM_NAME)	VMware vSphere Client Select machine: Virtual Machine Main Window: Upper side of tab view
Sampling Time (SAMPLING_TIME)	VMware vSphere Client Select machine: Host TAB: Performance Graph: Time
Size (SIZE)	VMware vSphere Client Select machine: Virtual Machine TAB: Summary General: Memory
Used (USED)	RESOURCE_USED + VM_SWAP_USED + HOST_SWAP_USED
Resource Used (RESOURCE_USED)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: Memory Counters: Description: Consumed, Internal Name: consumed
VM Swap Used (VM_SWAP_USED)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance

PFM - View name (PFM - Manager name)	Data Sources
VM Swap Used (VM_SWAP_USED)	Chart Options: Memory Counters: Description: Balloon, Internal Name: vmmemctl
Host Swap Used (HOST_SWAP_USED)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: Memory Counters: Description: Swapped, Internal Name: swapped
Unused (UNUSED)	SIZE - USED
Used % (USED_PERCENT)	$(USED / SIZE) * 100$
Resource Used % (RESOURCE_USED_PERCENT)	$(RESOURCE\_USED / SIZE) * 100$
VM Swap Used % (VM_SWAP_USED_PERCENT)	$(VM\_SWAP\_USED / SIZE) * 100$
Host Swap Used % (HOST_SWAP_USED_PERCENT)	$(HOST\_SWAP\_USED / SIZE) * 100$
VM Swap IO (VM_SWAP_IO)	VM_SWAP_IN + VM_SWAP_OUT
VM Swap In (VM_SWAP_IN)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: Memory Counters: Description: Swap in, Internal Name: swapin
VM Swap Out (VM_SWAP_OUT)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: Memory Counters: Description: Swap out, Internal Name: swapout
Working Size (WORKING_SIZE)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: Memory Counters: Description: Active, Internal Name: active
Working Size % (WORKING_SIZE_PERCENT)	$(WORKING\_SIZE / SIZE) * 100$
Share (SHARE)	VMware vSphere Client Select machine: Virtual Machine TAB: Resource Allocation Memory: Resource Settings: Shares
Max (MAX)	VMware vSphere Client

PFM - View name (PFM - Manager name)	Data Sources
Max (MAX)	Select machine: Virtual Machine TAB: Resource Allocation Memory: Resource Settings: Limit
Min (MIN)	VMware vSphere Client Select machine: Virtual Machine TAB: Resource Allocation Memory: Resource Settings: Reservation
Expectation (EXPECTATION)	$(\text{share} / \sum \text{share}) * \text{PI\_HMI.size}$
Max % (MAX_PERCENT)	$(\text{MAX} / \text{SIZE}) * 100$
Min % (MIN_PERCENT)	$(\text{MIN} / \text{SIZE}) * 100$
Expectation % (EXPECTATION_PERCENT)	$(\text{EXPECTATION} / \text{PI\_HMI.SIZE}) * 100$

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (11) VM Network Status(PI\_VNI)

The following table lists the data sources in each fields of the VM Network Status(PI\_VNI) record.

Table L–11: The data sources in each fields of the VM Network Status(PI\_VNI) record (VMware)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
VM ID (VM_ID)	--
Net ID (NET_ID)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: Network Objects: Description
VM Host Name (VM_HOST_NAME)	VMware vSphere Client Select machine: Virtual Machine TAB: Summary General: DNS Name
VM Name (VM_NAME)	VMware vSphere Client Select machine: Virtual Machine Main Window: Upper side of tab view
Sampling Time (SAMPLING_TIME)	VMware vSphere Client

PFM - View name (PFM - Manager name)	Data Sources
Sampling Time (SAMPLING_TIME)	Select machine: Host TAB: Performance Graph: Time
Rate (RATE)	SEND_RATE + RECV_RATE
Send Rate (SEND_RATE)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: Network Counters: Description: Data transmit rate, Internal Name: transmitted
Recv Rate (RECV_RATE)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: Network Counters: Description: Data receive rate, Internal Name: received

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (12) VM Physical Disk Status(PI\_VPDI)

The following table lists the data sources in each fields of the VM Physical Disk Status(PI\_VPDI) record.

Table L–12: The data sources in each fields of the VM Physical Disk Status(PI\_VPDI) record (VMware)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
VM ID (VM_ID)	--
Disk ID (DISK_ID)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: Disk Objects: Description
VM Host Name (VM_HOST_NAME)	VMware vSphere Client Select machine: Virtual Machine TAB: Summary General: DNS Name
VM Name (VM_NAME)	VMware vSphere Client Select machine: Virtual Machine

PFM - View name (PFM - Manager name)	Data Sources
VM Name (VM_NAME)	Main Window: Upper side of tab view
Sampling Time (SAMPLING_TIME)	VMware vSphere Client Select machine: Host TAB: Performance Graph: Time
Speed (SPEED)	READ_SPEED + WRITE_SPEED
Read Speed (READ_SPEED)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: Disk Counters: Description: Read rate, Internal Name: read
Write Speed (WRITE_SPEED)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: Disk Counters: Description: Write rate, Internal Name: write
Requests (REQUESTS)	READ_REQUESTS + WRITE_REQUESTS
Read Requests (READ_REQUESTS)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: Disk Counters: Description: Read requests, Internal Name: numberRead
Write Requests (WRITE_REQUESTS)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: Disk Counters: Description: Write requests, Internal Name: numberWrite
Commands (COMMANDS)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: Disk Counters: Description: Commands issued, Internal Name: commands
Abort Commands (ABORT_COMMANDS)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: Disk Counters: Description: Commands aborted, Internal Name: commandsAborted
Abort Commands % (ABORT_COMMANDS_PERCENT)	ABORT_COMMANDS / COMMANDS * 100

PFM - View name (PFM - Manager name)	Data Sources
Bus Resets (BUS_RESETS)	VMware vSphere Client Select machine: Virtual Machine TAB: Performance Chart Options: Disk Counters: Description: Bus resets, Internal Name: busResets

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (13) VM Status Detail(PD\_VM)

The following table lists the data sources in each fields of the VM Status Detail(PD\_VM) record.

Table L–13: The data sources in each fields of the VM Status Detail(PD\_VM) record (VMware)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
VM ID (VM_ID)	--
VM Host Name (VM_HOST_NAME)	VMware vSphere Client Select machine: Virtual Machine TAB: Summary General: DNS Name
VM Name (VM_NAME)	VMware vSphere Client Select machine: Virtual Machine Main Window: Upper side of tab view
Status (STATUS)	VMware vSphere Client Select machine: Virtual Machine TAB: Summary General: State
Information (INFORMATION)	VMware vSphere Client Select machine: Virtual Machine TAB: Summary General: Guest OS

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (14) VM Status(PI\_VI)

The following table lists the data sources in each fields of the VM Status(PI\_VI) record.



Table L–14: The data sources in each fields of the VM Status(PI\_VI) record (VMware)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
VM ID (VM_ID)	--
Clocks (CLOCKS)	<p>[In case of the UseVcpuMax value set N as instance information]</p> <p>VMware vSphere Client Select machine: Host TAB: Configuration Hardware: Processors General: Processor Speed</p> <p>[In case of the UseVcpuMax value set Y as instance information]</p> <p>VMware vSphere Client Select machine: Virtual Machine TAB: Resource Allocation CPU: Resource Settings: Limit If Resource Settings is Unlimited, same as [In case of the UseVcpuMax value set N as instance information].</p>
Count (COUNT)	<p>VMware vSphere Client Select machine: Virtual Machine TAB: Summary General: CPU (VirtualMachine.config.hardware.numCPU)</p>
VM Host Name (VM_HOST_NAME)	<p>VMware vSphere Client Select machine: Virtual Machine TAB: Summary General: DNS Name</p>
VM Name (VM_NAME)	<p>VMware vSphere Client Select machine: Virtual Machine Main Window: Upper side of tab view</p>
Sampling Time (SAMPLING_TIME)	<p>VMware vSphere Client Select machine: Host TAB: Performance Graph: Time</p>
Used (USED)	$\sum PI\_VCI.USED$
Insufficient (INSUFFICIENT)	$\sum PI\_VCI.INSUFFICIENT$
Request (REQUEST)	USED + INSUFFICIENT
Host Used % (HOST_USED_PERCENT)	$USED / PI.CLOCKS * 100$
Used % (USED_PERCENT)	$USED / CLOCKS * 100$

PFM - View name (PFM - Manager name)	Data Sources
Insufficient % (INSUFFICIENT_PERCENT)	INSUFFICIENT / CLOCKS * 100
Request % (REQUEST_PERCENT)	REQUEST / CLOCKS * 100
Used Per Request (USED_PER_REQUEST)	USED / REQUEST * 100
Insufficient Per Request (INSUFFICIENT_PER_REQUEST)	INSUFFICIENT / REQUEST * 100
Affinity (AFFINITY)	VMware vSphere Client Select machine: Virtual Machine TAB: Summary Commands: Edit Settings Virtual Machine Properties: TAB: Resources Advanced CPU: Scheduling Affinity
Share (SHARE)	VMware vSphere Client Select machine: Virtual Machine TAB: Resource Allocation CPU: Resource Settings: Shares
Max (MAX)	VMware vSphere Client Select machine: Virtual Machine TAB: Resource Allocation CPU: Resource Settings: Limit
Min (MIN)	VMware vSphere Client Select machine: Virtual Machine TAB: Resource Allocation CPU: Resource Settings: Reservation
Expectation (EXPECTATION)	PI.CLOCKS * EXPECTATION_PERCENT / 100
Max % (MAX_PERCENT)	MAX / CLOCKS * 100
Min % (MIN_PERCENT)	MIN / CLOCKS * 100
Expectation % (EXPECTATION_PERCENT)	SHARE / $\sum$ SHARE * 100

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## L.2 In Hyper-V

This section describes the field values of the data sources in Hyper-V.

### (1) Host CPU Status(PI\_HCI)

The following table lists the data sources in each fields of the Host CPU Status(PI\_HCI) record.

**Table L–15: The data sources in each fields of the Host CPU Status(PI\_HCI) record (Hyper-V)**

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Record Type (INPUT_RECORD_TYPE)	--	--
Record Time (RECORD_TIME)	--	--
Interval (INTERVAL)	--	--
VA DeviceID (VADEVICEID)	--	--
CPU ID (CPU_ID)	C	C:Win32_PerfRawData_HvStats_HyperVHypervisorLogicalProcessor.Name
CPU Name (CPU_NAME)	C	C:Win32_Processor.Name
Sampling Time (SAMPLING_TIME)	C	C:Win32_OperatingSystem.LocalDateTime
Clocks (CLOCKS)	C	C:Win32_Processor.MaxClockSpeed
Used (USED)	$CLOCKS * USED\_PERCENT / 100$	--
Unused (UNUSED)	$CLOCKS * (100 - USED\_PERCENT) / 100$	--
Used % (USED_PERCENT)	$TB * \Delta C / \Delta T / 100000$	C:Win32_PerfRawData_HvStats_HyperVHypervisorLogicalProcessor.PercentTotalRunTime T: Win32_PerfRawData_HvStats_HyperVHypervisorLogicalProcessor.Timestamp_PerfTime TB:Win32_PerfRawData_HvStats_HyperVHypervisorLogicalProcessor.Frequency_PerfTime
Unused % (UNUSED_PERCENT)	$100 - USED\_PERCENT$	--

Legend:

C: Counter value.

T: Time value.

TB: Time base.

$\Delta$  : This time collected value - Last time collected value.

--: The field stores the raw (not altered) value of performance data acquired.

## (2) Host Logical Disk Status(PI\_HLDI)

The following table lists the data sources in each fields of the Host Logical Disk Status(PI\_HLDI) record.

**Table L–16: The data sources in each fields of the Host Logical Disk Status(PI\_HLDI) record (Hyper-V)**

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Record Type (INPUT_RECORD_TYPE)	--	--

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Record Time (RECORD_TIME)	--	--
Interval (INTERVAL)	--	--
VA DeviceID (VADEVICEID)	--	--
Disk ID (DISK_ID)	C	C:Win32_Volume.Name (Only in case of Win32_Volume.DriveType = 3 (Hard disk) )
Sampling Time (SAMPLING_TIME)	C	C:Win32_OperatingSystem.LocalDateTime
Size (SIZE)	C / 1024 / 1024	C:Win32_Volume.Capacity
Used (USED)	SIZE - FREE	--
Free (FREE)	C / 1024 / 1024	C:Win32_Volume.FreeSpace
Used % (USED_PERCENT)	(USED / SIZE) * 100	--

Legend:

C: Counter value.

--: The field stores the raw (not altered) value of performance data acquired.

### (3) Host Memory Status(PI\_HMI)

The following table lists the data sources in each fields of the Host Memory Status(PI\_HMI) record.

Table L–17: The data sources in each fields of the Host Memory Status(PI\_HMI) record (Hyper-V)

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Record Type (INPUT_RECORD_TYPE)	--	--
Record Time (RECORD_TIME)	--	--
Interval (INTERVAL)	--	--
VA DeviceID (VADEVICEID)	--	--
Size (SIZE)	C / 1024 / 1024	C:Win32_ComputerSystem.TotalPhysicalMemory
Sampling Time (SAMPLING_TIME)	C	C:Win32_OperatingSystem.LocalDateTime
Used (USED)	SIZE - UNUSED	--
VMM Used (VMM_USED)	--	--
VM Used (VM_USED)	--	--
Unused (UNUSED)	C	C:Win32_PerfFormattedData_PerfOS_Memory.AvailableMbytes
VM Swap Used (VM_SWAP_USED)	--	--

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Host Swap Used (HOST_SWAP_USED)	--	--
Total Used (TOTAL_USED)	USED	--
Used % (USED_PERCENT)	$(USED / SIZE) * 100$	--
VMM Used % (VMM_USED_PERCENT)	--	--
VM Used % (VM_USED_PERCENT)	--	--
VM Swap Used % (VM_SWAP_USED_PERCENT)	--	--
Host Swap Used % (HOST_SWAP_USED_PERCENT)	--	--
Total Used % (TOTAL_USED_PERCENT)	$(TOTAL_USED / SIZE) * 100$	--
Swap IO (SWAP_IO)	--	--
Swap In IO (SWAP_IN_IO)	--	--
Swap Out IO (SWAP_OUT_IO)	--	--

Legend:

C: Counter value.

--: The field stores the raw (not altered) value of performance data acquired.

## (4) Host Network Status(PI\_HNI)

The following table lists the data sources in each fields of the Host Network Status(PI\_HNI) record.

Table L–18: The data sources in each fields of the Host Network Status(PI\_HNI) record (Hyper-V)

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Record Type (INPUT_RECORD_TYPE)	--	--
Record Time (RECORD_TIME)	--	--
Interval (INTERVAL)	--	--
VA DeviceID (VADEVICEID)	--	--
Net ID (NET_ID)	C	C:Win32_PerfRawData_Tcpip_NetworkInterface.Name
Sampling Time (SAMPLING_TIME)	C	C:Win32_OperatingSystem.LocalDateTime

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Rate (RATE)	$\Delta C / (\Delta T / TB) / 1024$	C:Win32_PerfRawData_Tcpip_NetworkInterface.BytesTotalPersec T:Win32_PerfRawData_Tcpip_NetworkInterface.Timestamp_PerfTime TB:Win32_PerfRawData_Tcpip_NetworkInterface.Frequency_PerfTime
Send Rate (SEND_RATE)	$\Delta C / (\Delta T / TB) / 1024$	C:Win32_PerfRawData_Tcpip_NetworkInterface.BytesSentPersec T:Win32_PerfRawData_Tcpip_NetworkInterface.Timestamp_PerfTime TB:Win32_PerfRawData_Tcpip_NetworkInterface.Frequency_PerfTime
Recv Rate (RECV_RATE)	$\Delta C / (\Delta T / TB) / 1024$	Win32_PerfRawData_Tcpip_NetworkInterface.BytesReceivedPersec T:Win32_PerfRawData_Tcpip_NetworkInterface.Timestamp_PerfTime TB:Win32_PerfRawData_Tcpip_NetworkInterface.Frequency_PerfTime

Legend:

C: Counter value.

T: Time value.

TB: Time base.

$\Delta$  : This time collected value - Last time collected value.

--: The field stores the raw (not altered) value of performance data acquired.

## (5) Host Physical Disk Status(PI\_HPDI)

The following table lists the data sources in each fields of the Host Physical Disk Status(PI\_HPDI) record.

Table L–19: The data sources in each fields of the Host Physical Disk Status(PI\_HPDI) record (Hyper-V)

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Record Type (INPUT_RECORD_TYPE)	--	--
Record Time (RECORD_TIME)	--	--
Interval (INTERVAL)	--	--
VA DeviceID (VADEVICEID)	--	--
Disk ID (DISK_ID)	C	C:Win32_PerfRawData_PerfDisk_PhysicalDisk.Name
Sampling Time (SAMPLING_TIME)	C	C:Win32_OperatingSystem.LocalDateTime
Speed (SPEED)	$\Delta C / (\Delta T / TB) / 1024$	C:Win32_PerfRawData_PerfDisk_PhysicalDisk.DiskBytesPersec

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Speed (SPEED)	$\Delta C / (\Delta T / TB) / 1024$	T:Win32_PerfRawData_PerfDisk_PhysicalDisk.Timestamp_PerfTime TB:Win32_PerfRawData_PerfDisk_PhysicalDisk.Frequency_PerfTime
Read Speed (READ_SPEED)	$\Delta C / (\Delta T / TB) / 1024$	Win32_PerfRawData_PerfDisk_PhysicalDisk.DiskReadBytesPersec T:Win32_PerfRawData_PerfDisk_PhysicalDisk.Timestamp_PerfTime TB:Win32_PerfRawData_PerfDisk_PhysicalDisk.Frequency_PerfTime
Write Speed (WRITE_SPEED)	$\Delta C / (\Delta T / TB) / 1024$	Win32_PerfRawData_PerfDisk_PhysicalDisk.DiskWriteBytesPersec T:Win32_PerfRawData_PerfDisk_PhysicalDisk.Timestamp_PerfTime TB:Win32_PerfRawData_PerfDisk_PhysicalDisk.Frequency_PerfTime
Requests (REQUESTS)	$\Delta C / (\Delta T / TB)$	Win32_PerfRawData_PerfDisk_PhysicalDisk.DiskTransfersPersec T:Win32_PerfRawData_PerfDisk_PhysicalDisk.Timestamp_PerfTime TB:Win32_PerfRawData_PerfDisk_PhysicalDisk.Frequency_PerfTime
Read Requests (READ_REQUESTS)	$\Delta C / (\Delta T / TB)$	Win32_PerfRawData_PerfDisk_PhysicalDisk.DiskReadsPersec T:Win32_PerfRawData_PerfDisk_PhysicalDisk.Timestamp_PerfTime TB:Win32_PerfRawData_PerfDisk_PhysicalDisk.Frequency_PerfTime
Write Requests (WRITE_REQUESTS)	$\Delta C / (\Delta T / TB)$	Win32_PerfRawData_PerfDisk_PhysicalDisk.DiskWritesPersec T:Win32_PerfRawData_PerfDisk_PhysicalDisk.Timestamp_PerfTime TB:Win32_PerfRawData_PerfDisk_PhysicalDisk.Frequency_PerfTime
Commands (COMMANDS)	--	--
Abort Commands (ABORT_COMMANDS)	--	--
Abort Commands % (ABORT_COMMANDS_PERCENT)	--	--
Bus Resets (BUS_RESETS)	--	--

Legend:

C: Counter value.

T: Time value.

TB: Time base.

$\Delta$  : This time collected value - Last time collected value.

--: The field stores the raw (not altered) value of performance data acquired.

## (6) Host Status Detail(PD)

The following table lists the data sources in each fields of the Host Status Detail(PD) record.

Table L–20: The data sources in each fields of the Host Status Detail(PD) record (Hyper-V)

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Record Type (INPUT_RECORD_TYPE)	--	--
Record Time (RECORD_TIME)	--	--
Interval (INTERVAL)	--	--
VA DeviceID (VADEVICEID)	--	--
Status (STATUS)	--	--
Host Name (HOST_NAME)	Setting for monitored: VM_Host	--
Reason (REASON)	--	--
Product (PRODUCT)	C1, C2, C3, C4	C1:Win32_OperatingSystem.Caption C2:Win32_OperatingSystem.OtherTypeDescription C3:Win32_OperatingSystem.CSDVersion C4:Win32_OperatingSystem.Version
VM Count (VM_COUNT)	The number of the instance of Msvm_ComputerSystem	--
VM Active (VM_ACTIVE)	Msvm_ComputerSystem.EnabledState is the number of 2(Enabled) in the number of the instance of Msvm_ComputerSystem	--

Legend:

Cn: Counter value.

--: The field stores the raw (not altered) value of performance data acquired.

## (7) Host Status(PI)

The following table lists the data sources in each fields of the Host Status(PI) record.

Table L–21: The data sources in each fields of the Host Status(PI) record (Hyper-V)

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Record Type (INPUT_RECORD_TYPE)	--	--
Record Time (RECORD_TIME)	--	--
Interval (INTERVAL)	--	--
VA DeviceID (VADEVICEID)	--	--



PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Clocks (CLOCKS)	C * COUNT	C:Win32_Processor.MaxClockSpeed
Count (COUNT)	The number of C except "_Total"	C:Win32_PerfRawData_HvStats_HyperVHypervisorLogicalProcessor.Name
Sampling Time (SAMPLING_TIME)	C	C:Win32_OperatingSystem.LocalDateTime
Used (USED)	CLOCKS * USED_PERCENT / 100	--
VMM Used (VMM_USED)	CLOCKS * VMM_USED_PERCENT / 100	--
VM Used (VM_USED)	CLOCKS * VM_USED_PERCENT / 100	--
VMM Console Used (VMM_CONSOLE_USED)	--	--
VMM Kernel Used (VMM_KERNEL_USED)	--	--
VMM Others Used (VMM_OTHERS_USED)	--	--
Unused (UNUSED)	CLOCKS * UNUSED_PERCENT / 100	--
Used % (USED_PERCENT)	(TB which C1 is equal to "_Total") * $\Delta C2 / \Delta T / 100000$	C1:Win32_PerfRawData_HvStats_HyperVHypervisorLogicalProcessor.Name C2:Win32_PerfRawData_HvStats_HyperVHypervisorLogicalProcessor.PercentTotalRunTime T:Win32_PerfRawData_HvStats_HyperVHypervisorLogicalProcessor.Timestamp_PerfTime TB:Win32_PerfRawData_HvStats_HyperVHypervisorLogicalProcessor.Frequency_PerfTime
VMM Used % (VMM_USED_PERCENT)	(TB which C1 is equal to "_Total") * $\Delta C2 / \Delta T / 100000$	C1:Win32_PerfRawData_HvStats_HyperVHypervisorLogicalProcessor.Name C2:Win32_PerfRawData_HvStats_HyperVHypervisorLogicalProcessor.PercentHypervisorRunTime T:Win32_PerfRawData_HvStats_HyperVHypervisorLogicalProcessor.Timestamp_PerfTime TB:Win32_PerfRawData_HvStats_HyperVHypervisorLogicalProcessor.Frequency_PerfTime
VM Used % (VM_USED_PERCENT)	(TB which C1 is equal to "_Total") * $\Delta C2 / \Delta T / 100000$	C1:Win32_PerfRawData_HvStats_HyperVHypervisorLogicalProcessor.Name C2:Win32_PerfRawData_HvStats_HyperVHypervisorLogicalProcessor.PercentGuestRunTime T:Win32_PerfRawData_HvStats_HyperVHypervisorLogicalProcessor.Timestamp_PerfTime TB:Win32_PerfRawData_HvStats_HyperVHypervisorLogicalProcessor.Frequency_PerfTime
VMM Console Used % (VMM_CONSOLE_USED_PERCENT)	--	--
VMM Kernel Used % (VMM_KERNEL_USED_PERCENT)	--	--

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
VMM Others Used % (VMM_OTHERS_USED_PERCENT)	--	--
Unused % (UNUSED_PERCENT)	100 - USED_PERCENT	--

Legend:

C, Cn: Counter value.

T: Time value.

TB: Time base.

Δ : This time collected value - Last time collected value.

--: The field stores the raw (not altered) value of performance data acquired.

## (8) VM CPU Status(PI\_VCI)

The following table lists the data sources in each fields of the VM CPU Status(PI\_VCI) record.

Table L–22: The data sources in each fields of the VM CPU Status(PI\_VCI) record (Hyper-V)

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Record Type (INPUT_RECORD_TYPE)	--	--
Record Time (RECORD_TIME)	--	--
Interval (INTERVAL)	--	--
VA DeviceID (VADEVICEID)	--	--
VM ID (VM_ID)	[Root-Partition] "Root" (Fixed) [Child-Partition] C	C: Msvm_ComputerSystem.Name
CPU ID (CPU_ID)	[Root-Partition] <Id> which is part of "Root VP<Id>" in C1 [Child-Partition] <Id> which is part of "<Virtual Machine Name>:Hv VP <Id>:" in C2	C1:Win32_PerfRawData_HvStats_HyperVHypervisorRootVirtualProcessor.Name C2:Win32_PerfRawData_HvStats_HyperVHypervisorVirtualProcessor.Name
VM Host Name (VM_HOST_NAME)	--	--
VM Name (VM_NAME)	[Root-Partition] C1 [Child-Partition] According C1 with <Virtual Machine Name> which is part of "<Virtual Machine Name>:Hv VP <Id>:" in C2	C1:Msvm_ComputerSystem.ElementName C2:Win32_PerfRawData_HvStats_HyperVHypervisorVirtualProcessor.Name

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Sampling Time (SAMPLING_TIME)	C	C:Win32_OperatingSystem.LocalDateTime
Used (USED)	$C * USED\_PERCENT / 100$	C:Win32_Processor.MaxClockSpeed
Insufficient (INSUFFICIENT)	--	--
Request (REQUEST)	--	--
Used % (USED_PERCENT)	[Root-Partition] $TB1 * \Delta C1 / \Delta T1 / 100000$ [Child-Partition] $TB2 * \Delta C2 / \Delta T2 / 100000$	C1:Win32_PerfRawData_HvStats_HyperVHypervisorRootVirtualProcessor.PercentTotalRunTime T1:Win32_PerfRawData_HvStats_HyperVHypervisorRootVirtualProcessor.Timestamp_PerfTime TB1:Win32_PerfRawData_HvStats_HyperVHypervisorRootVirtualProcessor.Frequency_PerfTime C2:Win32_PerfRawData_HvStats_HyperVHypervisorVirtualProcessor.PercentTotalRunTime T2:Win32_PerfRawData_HvStats_HyperVHypervisorVirtualProcessor.Timestamp_PerfTime TB2:Win32_PerfRawData_HvStats_HyperVHypervisorVirtualProcessor.Frequency_PerfTime
Insufficient % (INSUFFICIENT_PERCENT)	--	--
Request % (REQUEST_PERCENT)	--	--
Used Per Request (USED_PER_REQUEST)	--	--
Insufficient Per Request (INSUFFICIENT_PER_REQUEST)	--	--

**Legend:**

C, Cn: Counter value.

T: Time value.

TBn: Time base.

$\Delta$  : This time collected value - Last time collected value.

--: The field stores the raw (not altered) value of performance data acquired.

## (9) VM Logical Disk Status(PI\_VLDI)

The following table lists the data sources in each fields of the VM Logical Disk Status(PI\_VLDI) record.

**Table L–23: The data sources in each fields of the VM Logical Disk Status(PI\_VLDI) record (Hyper-V)**

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Record Type (INPUT_RECORD_TYPE)	--	--

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Record Time (RECORD_TIME)	--	--
Interval (INTERVAL)	--	--
VA DeviceID (VADEVICEID)	--	--
VM ID (VM_ID)	--	--
Disk ID (DISK_ID)	--	--
VM Host Name (VM_HOST_NAME)	--	--
VM Name (VM_NAME)	--	--
Sampling Time (SAMPLING_TIME)	--	--
Size (SIZE)	--	--
Used (USED)	--	--
Free (FREE)	--	--
Used % (USED_PERCENT)	--	--

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (10) VM Memory Status(PI\_VMI)

The following table lists the data sources in each fields of the VM Memory Status(PI\_VMI) record.

**Table L–24:** The data sources in each fields of the VM Memory Status(PI\_VMI) record (Hyper-V)

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Record Type (INPUT_RECORD_TYPE)	--	--
Record Time (RECORD_TIME)	--	--
Interval (INTERVAL)	--	--
VA DeviceID (VADEVICEID)	--	--
VM ID (VM_ID)	C	C:Msvm_ComputerSystem.Name
VM Host Name (VM_HOST_NAME)	--	--
VM Name (VM_NAME)	C	C:Msvm_ComputerSystem.ElementName
Sampling Time (SAMPLING_TIME)	C	C:Win32_OperatingSystem.LocalDateTime
Size (SIZE)	C1 * C2 / 1024 / 1024	C1:Msvm_Memory.BlockSize C2:Msvm_Memory.NumberOfBlocks

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Used (USED)	SIZE	--
Resource Used (RESOURCE_USED)	SIZE	--
VM Swap Used (VM_SWAP_USED)	--	--
Host Swap Used (HOST_SWAP_USED)	--	--
Unused (UNUSED)	0 (Fixed)	--
Used % (USED_PERCENT)	100 (Fixed)	--
Resource Used % (RESOURCE_USED_PERCENT)	100 (Fixed)	--
VM Swap Used % (VM_SWAP_USED_PERCENT)	--	--
Host Swap Used % (HOST_SWAP_USED_PERCENT)	--	--
VM Swap IO (VM_SWAP_IO)	--	--
VM Swap In (VM_SWAP_IN)	--	--
VM Swap Out (VM_SWAP_OUT)	--	--
Working Size (WORKING_SIZE)	--	--
Working Size % (WORKING_SIZE_PERCENT)	--	--
Share (SHARE)	--	--
Max (MAX)	--	--
Min (MIN)	--	--
Expectation (EXPECTATION)	--	--
Max % (MAX_PERCENT)	--	--
Min % (MIN_PERCENT)	--	--
Expectation % (EXPECTATION_PERCENT)	--	--

**Legend:**

C, Cn: Counter value.

--: The field stores the raw (not altered) value of performance data acquired.

## (11) VM Network Status(PI\_VNI)

The following table lists the data sources in each fields of the VM Network Status(PI\_VNI) record.

Table L–25: The data sources in each fields of the VM Network Status(PI\_VNI) record (Hyper-V)

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Record Type (INPUT_RECORD_TYPE)	--	--
Record Time (RECORD_TIME)	--	--
Interval (INTERVAL)	--	--
VA DeviceID (VADEVICEID)	--	--
VM ID (VM_ID)	[Root-Partition] "Root" (Fixed) [Child-Partition] C	C:Msvm_ComputerSystem.Name
Net ID (NET_ID)	<In 2008 Hyper-V, 2008 R2 Hyper-V, and 2012 Hyper-V> [Root-Partition] C1 + ":" + C2 (concatenated with colon) [Child-Partition] C3 + ":" + C4 (concatenated with colon) <In 2012 R2 Hyper-V> [Root-Partition] C5 + ":" + C6 (concatenated with colon) [Child-Partition] C5 + ":" + C7 (concatenated with colon)	C1:Msvm_SwitchLANEndPoint.MacAddress C2:Msvm_SwitchLANEndPoint.ElementName C3:Msvm_VmLANEndPoint.MacAddress C4:Msvm_VirtualSwitch.ElementName C5:Msvm_LANEndpoint.MacAddress C6:Msvm_LANEndpoint.ElementName C7:Msvm_VirtualEthernetSwitch.ElementName
VM Host Name (VM_HOST_NAME)	--	--
VM Name (VM_NAME)	C	C:Msvm_ComputerSystem.ElementName
Sampling Time (SAMPLING_TIME)	C	C:Win32_OperatingSystem.LocalDateTime
Rate (RATE)	$\Delta C / (\Delta T / TB) / 1024$	C:Win32_PerfRawData_NvspPortStats_HyperVVirtualSwitchPort.BytesPersec T:Win32_PerfRawData_NvspPortStats_HyperVVirtualSwitchPort.Timestamp_PerfTime TB:Win32_PerfRawData_NvspPortStats_HyperVVirtualSwitchPort.Frequency_PerfTime
Send Rate (SEND_RATE)	$\Delta C / (\Delta T / TB) / 1024$	C:Win32_PerfRawData_NvspPortStats_HyperVVirtualSwitchPort.BytesReceivedPersec T:Win32_PerfRawData_NvspPortStats_HyperVVirtualSwitchPort.Timestamp_PerfTime TB:Win32_PerfRawData_NvspPortStats_HyperVVirtualSwitchPort.Frequency_PerfTime

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Recv Rate (RECV_RATE)	$\Delta C / (\Delta T / TB) / 1024$	C:Win32_PerfRawData_NvspPortStats_HyperVVirtualSwitchPort.BytesSentPersec T:Win32_PerfRawData_NvspPortStats_HyperVVirtualSwitchPort.Timestamp_PerfTime TB:Win32_PerfRawData_NvspPortStats_HyperVVirtualSwitchPort.Frequency_PerfTime

Legend:

C, Cn: Counter value.

T: Time value.

TB: Time base.

$\Delta$  : This time collected value - Last time collected value.

--: The field stores the raw (not altered) value of performance data acquired.

## (12) VM Physical Disk Status(PI\_VPDI)

The following table lists the data sources in each fields of the VM Physical Disk Status(PI\_VPDI) record.

Table L–26: The data sources in each fields of the VM Physical Disk Status(PI\_VPDI) record (Hyper-V)

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Record Type (INPUT_RECORD_TYPE)	--	--
Record Time (RECORD_TIME)	--	--
Interval (INTERVAL)	--	--
VA DeviceID (VADEVICEID)	--	--
VM ID (VM_ID)	C	C:Msvm_ComputerSystem.Name
Disk ID (DISK_ID)	<In 2008 Hyper-V, 2008 R2 Hyper-V, and 2012 Hyper-V> [Virtual hard disk] C1 [Physical hard disk] "Disk " + C2 <In 2012 R2 Hyper-V> [Virtual hard disk] C3 [Physical hard disk] "Disk " + C2	C1:Msvm_ResourceAllocationSettingData.Connection C2:Win32_DiskDrive.Index C3:Msvm_StorageAllocationSettingData.HostResource
VM Host Name (VM_HOST_NAME)	--	--
VM Name (VM_NAME)	C	C:Msvm_ComputerSystem.ElementName
Sampling Time (SAMPLING_TIME)	C	C:Win32_OperatingSystem.LocalDateTime

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Speed (SPEED)	READ_SPEED + WRITE_SPEED	--
Read Speed (READ_SPEED)	<In 2008 Hyper-V, 2008 R2 Hyper-V, and 2012 Hyper-V> $\Delta C1 / (\Delta T1 / TB1) / 1024$ <In 2012 R2 Hyper-V> $\Delta C2 / (\Delta T2 / TB2) / 1024$	C1:Win32_PerfRawData_StorageStats_HyperVVirtualStorageDevice.ReadBytesPersec T1:Win32_PerfRawData_StorageStats_HyperVVirtualStorageDevice.Timestamp_PerfTime TB1:Win32_PerfRawData_StorageStats_HyperVVirtualStorageDevice.Frequency_PerfTime C2:Win32_PerfRawData_Counters_HyperVVirtualStorageDevice.ReadBytesPersec T2:Win32_PerfRawData_Counters_HyperVVirtualStorageDevice.Timestamp_PerfTime TB2:Win32_PerfRawData_Counters_HyperVVirtualStorageDevice.Frequency_PerfTime
Write Speed (WRITE_SPEED)	<In 2008 Hyper-V, 2008 R2 Hyper-V, and 2012 Hyper-V> $\Delta C1 / (\Delta T1 / TB1) / 1024$ <In 2012 R2 Hyper-V> $\Delta C2 / (\Delta T2 / TB2) / 1024$	C1:Win32_PerfRawData_StorageStats_HyperVVirtualStorageDevice.WriteBytesPersec T1:Win32_PerfRawData_StorageStats_HyperVVirtualStorageDevice.Timestamp_PerfTime TB1:Win32_PerfRawData_StorageStats_HyperVVirtualStorageDevice.Frequency_PerfTime C2:Win32_PerfRawData_Counters_HyperVVirtualStorageDevice.WriteBytesPersec T2:Win32_PerfRawData_Counters_HyperVVirtualStorageDevice.Timestamp_PerfTime TB2:Win32_PerfRawData_Counters_HyperVVirtualStorageDevice.Frequency_PerfTime
Requests (REQUESTS)	--	--
Read Requests (READ_REQUESTS)	--	--
Write Requests (WRITE_REQUESTS)	--	--
Commands (COMMANDS)	--	--
Abort Commands (ABORT_COMMANDS)	--	--
Abort Commands % (ABORT_COMMANDS_PERCENT)	--	--
Bus Resets (BUS_RESETS)	--	--

Legend:

C, Cn: Counter value.

Tn: Time value.

TBn: Time base.

$\Delta$  : This time collected value - Last time collected value.

--: The field stores the raw (not altered) value of performance data acquired.

## (13) VM Status Detail(PD\_VM)

The following table lists the data sources in each fields of the VM Status Detail(PD\_VM) record.



**Table L–27: The data sources in each fields of the VM Status Detail(PD\_VM) record (Hyper-V)**

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Record Type (INPUT_RECORD_TYPE)	--	--
Record Time (RECORD_TIME)	--	--
Interval (INTERVAL)	--	--
VA DeviceID (VADEVICEID)	--	--
VM ID (VM_ID)	C	C:Msvm_ComputerSystem.Name
VM Host Name (VM_HOST_NAME)	--	--
VM Name (VM_NAME)	C	C:Msvm_ComputerSystem.ElementName
Status (STATUS)	The following character string corresponding to C 1:"OTHER", 2:"ON", 3:"OFF", 4:"STOPPING", 5:"NA", 6:"OFFLINE", 7:"TEST", 8:"DEFERRED", 9:"QUIESCE", 32768:"PAUSED", 32769:"SUSPENDED", 32770:"STARTING", 32771:"SNAPSHOTTING", 32773:"SAVING", 32774:"STOPPING", 32776:"PAUSINIG", 32777:"RESUMING", others:"UNKNOWN"	C:Msvm_ComputerSystem.EnabledState
Information (INFORMATION)	--	--

Legend:

C: Counter value.

--: The field stores the raw (not altered) value of performance data acquired.

## (14) VM Status(PI\_VI)

The following table lists the data sources in each fields of the VM Status(PI\_VI) record.

Table L–28: The data sources in each fields of the VM Status(PI\_VI) record (Hyper-V)

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Record Type (INPUT_RECORD_TYPE)	--	--
Record Time (RECORD_TIME)	--	--
Interval (INTERVAL)	--	--
VA DeviceID (VADEVICEID)	--	--
VM ID (VM_ID)	[Root-Partition] "Root"(Fixed) [Child-Partition] C	C:Msvm_ComputerSystem.Name
Clocks (CLOCKS)	C * COUNT	C:Win32_Processor.MaxClockSpeed
Count (COUNT)	[Root-Partition] The number of C1 except "_Total" [Child-Partition] The number of according vm_name with <Name> which is part of "<Name>:Hv VP" in C2	C1:Win32_PerfRawData_HvStats_HyperVHypervisorRootVirtualProcessor.Name C2:Win32_PerfRawData_HvStats_HyperVHypervisorVirtualProcessor.Name
VM Host Name (VM_HOST_NAME)	--	--
VM Name (VM_NAME)	C	C:Msvm_ComputerSystem.ElementName
Sampling Time (SAMPLING_TIME)	C	C:Win32_OperatingSystem.LocalDateTime
Used (USED)	CLOCKS * USED_PERCENT / 100	--
Insufficient (INSUFFICIENT)	--	--
Request (REQUEST)	--	--
Host Used % (HOST_USED_PERCENT)	--	--
Used % (USED_PERCENT)	[Root-Partition] $TB1 * \Delta C1 / \Delta T1 / 100000$ [Child-Partition] (The total of $TB3 * \Delta C3 / \Delta T3 / 100000$ ) / COUNT	C1:Win32_PerfRawData_HvStats_HyperVHypervisorRootVirtualProcessor.PercentTotalRunTime T1:Win32_PerfRawData_HvStats_HyperVHypervisorRootVirtualProcessor.Timestamp_PerfTime TB1:Win32_PerfRawData_HvStats_HyperVHypervisorRootVirtualProcessor.Frequency_PerfTime C2:Win32_PerfRawData_HvStats_HyperVHypervisorVirtualProcessor.Name C3:Win32_PerfRawData_HvStats_HyperVHypervisorVirtualProcessor.PercentTotalRunTime T3:Win32_PerfRawData_HvStats_HyperVHypervisorVirtualProcessor.Timestamp_PerfTime TB3:Win32_PerfRawData_HvStats_HyperVHypervisorVirtualProcessor.Frequency_PerfTime

PFM - View name (PFM - Manager name)	Data Sources	
	Calculating Formula	WMI Classes
Insufficient % (INSUFFICIENT_PERCENT)	--	--
Request % (REQUEST_PERCENT)	--	--
Used Per Request (USED_PER_REQUEST)	--	--
Insufficient Per Request (INSUFFICIENT_PER_REQUEST)	--	--
Affinity (AFFINITY)	--	--
Share (SHARE)	[Root-Partition] -- [Child-Partition] C	C:Msvm_ProcessorSettingData.Weight
Max (MAX)	[Root-Partition] -- [Child-Partition] $MAX\_PERCENT * CLOCKS / 100$	--
Min (MIN)	[Root-Partition] -- [Child-Partition] $MIN\_PERCENT * CLOCKS / 100$	--
Expectation (EXPECTATION)	--	--
Max % (MAX_PERCENT)	[Root-Partition] -- [Child-Partition] $C / 1000$	C:Msvm_ProcessorSettingData.Limit
Min % (MIN_PERCENT)	[Root-Partition] -- [Child-Partition] $C / 1000$	C:Msvm_ProcessorSettingData.Reservation
Expectation % (EXPECTATION_PERCENT)	--	--

**Legend:**

C, Cn: Counter value.

Tn: Time value.

TBn: Time base.

$\Delta$  : This time collected value - Last time collected value.

--: The field stores the raw (not altered) value of performance data acquired.

#

TB3 which is same as <Virtual Host Name> of "<Virtual Host Name>:Hv VP <Id>".

## L.3 In KVM

This section describes the field values of the data sources in KVM.

### (1) Host CPU Status(PI\_HCI)

The following table lists the data sources in each fields of the Host CPU Status(PI\_HCI) record.

Table L–29: The data sources in each fields of the Host CPU Status(PI\_HCI) record (KVM)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
CPU ID (CPU_ID)	The "processor" line in the "/proc/cpuinfo" file
CPU Name (CPU_NAME)	The "model name" line in the "/proc/cpuinfo" file
Sampling Time (SAMPLING_TIME)	date - Iseconds
Clocks (CLOCKS)	The value of "/sys/devices/system/cpu/cpu0/cpufreq/cpuinfo_max_freq" file / 1000 In case of not exist the file "/sys/devices/system/cpu/cpu0/cpufreq/cpuinfo_max_freq", the "cpu MHz" value in "/proc/cpuinfo" file
Used (USED)	$CLOCKS * (USED\_PERCENT / 100)$
Unused (UNUSED)	$CLOCKS - USED$
Used % (USED_PERCENT)	$\Delta$ The "cpu0~" line and the "usr+nice+sys" column in the "/proc/stat" file / $\Delta$ Collection time
Unused % (UNUSED_PERCENT)	$100 - USED\_PERCENT$

Legend:

$\Delta$  : This time collected value - Last time collected value.

--: The field stores the raw (not altered) value of performance data acquired.

### (2) Host Logical Disk Status(PI\_HLDI)

The following table lists the data sources in each fields of the Host Logical Disk Status(PI\_HLDI) record.

Table L–30: The data sources in each fields of the Host Logical Disk Status(PI\_HLDI) record (KVM)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
Disk ID (DISK_ID)	The "FileSystem" column in the result of "df -lkP"

PFM - View name (PFM - Manager name)	Data Sources
Sampling Time (SAMPLING_TIME)	date -Iseconds
Size (SIZE)	The "1024-blocks" column in the result of "df -lkP" / 1024
Used (USED)	The "Used" column in the result of "df -lkP" / 1024
Free (FREE)	The "Available" column in the result of "df -lkP" / 1024
Used % (USED_PERCENT)	(USED / SIZE) * 100

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

### (3) Host Memory Status(PI\_HMI)

The following table lists the data sources in each fields of the Host Memory Status(PI\_HMI) record.

Table L–31: The data sources in each fields of the Host Memory Status(PI\_HMI) record (KVM)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
Size (SIZE)	"Mem:" line and "total" column in the result of "free -m"
Sampling Time (SAMPLING_TIME)	date -Iseconds
Used (USED)	"-/+ buffers/cache" line and "used" column in the result of "free -m"
VMM Used (VMM_USED)	"RSS" column in the result of "ps aux" / 1024 The total of ksmd, virt-manager, libvirtd processes
VM Used (VM_USED)	The total of PI_VMI.RESOURCE_USED
Unused (UNUSED)	"-/+ buffers/cache" line and "free" column in the result of "free -m"
VM Swap Used (VM_SWAP_USED)	The total of PI_VMI.VM_SWAP_USED
Host Swap Used (HOST_SWAP_USED)	The total of PI_VMI.HOST_SWAP_USED
Total Used (TOTAL_USED)	USED + VM_SWAP_USED + HOST_SWAP_USED
Used % (USED_PERCENT)	(USED / SIZE) * 100
VMM Used % (VMM_USED_PERCENT)	(VMM_USED / SIZE) * 100
VM Used % (VM_USED_PERCENT)	(VM_USED / SIZE) * 100
VM Swap Used % (VM_SWAP_USED_PERCENT)	(VM_SWAP_USED / SIZE) * 100
Host Swap Used % (HOST_SWAP_USED_PERCENT)	(HOST_SWAP_USED / SIZE) * 100

PFM - View name (PFM - Manager name)	Data Sources
Total Used % (TOTAL_USED_PERCENT)	$(TOTAL\_USED / SIZE) * 100$
Swap IO (SWAP_IO)	SWAP_IN_IO + SWAP_OUT_IO
Swap In IO (SWAP_IN_IO)	"pages swapped in" line in the result of "vmstat -s" * "getconf PAGE_SIZE" / 1024 / 1024
Swap Out IO (SWAP_OUT_IO)	"pages swapped out" line in the result of "vmstat -s" * "getconf PAGE_SIZE" / 1024 / 1024

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (4) Host Network Status(PI\_HNI)

The following table lists the data sources in each fields of the Host Network Status(PI\_HNI) record.

Table L–32: The data sources in each fields of the Host Network Status(PI\_HNI) record (KVM)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
Net ID (NET_ID)	The interface that do not use in "virsh dumpxml {domain}" among the "ifconfig"
Sampling Time (SAMPLING_TIME)	date -Iseconds
Rate (RATE)	SEND_RATE + RECV_RATE
Send Rate (SEND_RATE)	$\Delta$ TX bytes in the "ifconfig" / $\Delta$ collection time / 1024
Recv Rate (RECV_RATE)	$\Delta$ RX bytes in the "ifconfig" / $\Delta$ collection time / 1024

Legend:

$\Delta$  : This time collected value - Last time collected value.

--: The field stores the raw (not altered) value of performance data acquired.

## (5) Host Physical Disk Status(PI\_HPDI)

The following table lists the data sources in each fields of the Host Physical Disk Status(PI\_HPDI) record.

Table L–33: The data sources in each fields of the Host Physical Disk Status(PI\_HPDI) record (KVM)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--

PFM - View name (PFM - Manager name)	Data Sources
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
Disk ID (DISK_ID)	The "Device:" column in the result of "iostat -x -k -d 1 1"
Sampling Time (SAMPLING_TIME)	date -Iseconds
Speed (SPEED)	READ_SPEED + WRITE_SPEED
Read Speed (READ_SPEED)	The "rkB/s" column in the result of "iostat -x -k -d 1 1"
Write Speed (WRITE_SPEED)	The "wkB/s" column in the result of "iostat -x -k -d 1 1"
Requests (REQUESTS)	READ_REQUESTS + WRITE_REQUESTS
Read Requests (READ_REQUESTS)	The "r/s" column in the result of "iostat -x -k -d 1 1"
Write Requests (WRITE_REQUESTS)	The "w/s" column in the result of "iostat -x -k -d 1 1"
Commands (COMMANDS)	--
Abort Commands (ABORT_COMMANDS)	--
Abort Commands % (ABORT_COMMANDS_PERCENT)	--
Bus Resets (BUS_RESETS)	--

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (6) Host Status Detail(PD)

The following table lists the data sources in each fields of the Host Status Detail(PD) record.

Table L–34: The data sources in each fields of the Host Status Detail(PD) record (KVM)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
Status (STATUS)	--
Host Name (HOST_NAME)	Setting for monitored VM_Host parameter
Reason (REASON)	--
Product (PRODUCT)	Display each values of "virsh version" in comma separated value
VM Count (VM_COUNT)	The number of lines in "virsh list -all"
VM Active (VM_ACTIVE)	The number of lines which "status" in the result of "virsh list -all" is lineage of "running,idle"

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (7) Host Status(PI)

The following table lists the data sources in each fields of the Host Status(PI) record.

Table L–35: The data sources in each fields of the Host Status(PI) record (KVM)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
Clocks (CLOCKS)	PI_HCI.CLOCKS * COUNT
Count (COUNT)	Count the number of CPUs in "/proc/cpuinfo"
Sampling Time (SAMPLING_TIME)	date -Iseconds
Used (USED)	CLOCKS * USED_PERCENT / 100
VMM Used (VMM_USED)	CLOCKS * VMM_USED_PERCENT / 100
VM Used (VM_USED)	CLOCKS * VM_USED_PERCENT / 100
VMM Console Used (VMM_CONSOLE_USED)	CLOCKS * VMM_CONSOLE_USED_PERCENT / 100
VMM Kernel Used (VMM_KERNEL_USED)	CLOCKS * VMM_KERNEL_USED_PERCENT / 100
VMM Others Used (VMM_OTHERS_USED)	CLOCKS * VMM_OTHERS_USED_PERCENT / 100
Unused (UNUSED)	CLOCKS - USED
Used % (USED_PERCENT)	$\Delta$ (The "CPU" line and "usr+nice+sys" column in the "/proc/stat" file) / ( $\Delta$ Collection time * 100 * COUNT) * 100
VMM Used % (VMM_USED_PERCENT)	USED_PERCENT - VM_USED_PERCENT
VM Used % (VM_USED_PERCENT)	$\Delta$ (The "CPU" line and "guest" column in the "/proc/stat" file) / ( $\Delta$ Collection time * 100 * COUNT) * 100
VMM Console Used % (VMM_CONSOLE_USED_PERCENT)	The "virt-manager" line and "PID" column in the result of "ps aux" $\Delta$ (The "PID" line and "TIME+" column of the "virt-manager" section in the result of "top -b -n 1") / ( $\Delta$ Collection time * COUNT) * 100
VMM Kernel Used % (VMM_KERNEL_USED_PERCENT)	The "libvirtd, ksmd" line and "PID" column in the result of "ps aux" $\Delta$ (The "libvirtd,ksmd" line and "PID" column in the result of "top -b -n 1") / ( $\Delta$ Collection time * COUNT) * 100
VMM Others Used % (VMM_OTHERS_USED_PERCENT)	VMM_USED_PERCENT - VMM_CONSOLE_USED_PERCENT - VMM_KERNEL_USED_PERCENT



PFM - View name (PFM - Manager name)	Data Sources
Unused % (UNUSED_PERCENT)	UNUSED / CLOCKS * 100

Legend:

Δ : This time collected value - Last time collected value.

--: The field stores the raw (not altered) value of performance data acquired.

## (8) VM CPU Status(PI\_VCI)

The following table lists the data sources in each fields of the VM CPU Status(PI\_VCI) record.

Table L–36: The data sources in each fields of the VM CPU Status(PI\_VCI) record (KVM)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
VM ID (VM_ID)	PD_VM.VM_ID
CPU ID (CPU_ID)	The "VCPU" line in the result of "virsh vcpuinfo {domain}"
VM Host Name (VM_HOST_NAME)	--
VM Name (VM_NAME)	PD_VM.VM_NAME
Sampling Time (SAMPLING_TIME)	date -Iseconds
Used (USED)	PI_HCI.CLOCKS * USED_PERCENT / 100
Insufficient (INSUFFICIENT)	--
Request (REQUEST)	--
Used % (USED_PERCENT)	Δ The "CPU time" line in the result of "virsh vcpuinfo {domain}" / Δ Collection time * 100
Insufficient % (INSUFFICIENT_PERCENT)	--
Request % (REQUEST_PERCENT)	--
Used Per Request (USED_PER_REQUEST)	--
Insufficient Per Request (INSUFFICIENT_PER_REQUEST)	--

Legend:

Δ : This time collected value - Last time collected value.

--: The field stores the raw (not altered) value of performance data acquired.

## (9) VM Logical Disk Status(PI\_VLDI)

The following table lists the data sources in each fields of the VM Logical Disk Status(PI\_VLDI) record.

**Table L–37: The data sources in each fields of the VM Logical Disk Status(PI\_VLDI) record (KVM)**

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
VM ID (VM_ID)	--
Disk ID (DISK_ID)	--
VM Host Name (VM_HOST_NAME)	--
VM Name (VM_NAME)	--
Sampling Time (SAMPLING_TIME)	--
Size (SIZE)	--
Used (USED)	--
Free (FREE)	--
Used % (USED_PERCENT)	--

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (10) VM Memory Status(PI\_VMI)

The following table lists the data sources in each fields of the VM Memory Status(PI\_VMI) record.

**Table L–38: The data sources in each fields of the VM Memory Status(PI\_VMI) record (KVM)**

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
VM ID (VM_ID)	PD_VM.VM_ID
VM Host Name (VM_HOST_NAME)	--
VM Name (VM_NAME)	PD_VM.VM_NAME
Sampling Time (SAMPLING_TIME)	date -Iseconds
Size (SIZE)	The "Kbytes" value in "total" line and in the result of "pmap -x {pid}" / 1024
Used (USED)	SIZE
Resource Used (RESOURCE_USED)	The "Dirty" value in "total" line and in the result of "pmap -x {pid}" / 1024
VM Swap Used (VM_SWAP_USED)	The "RSS" value in "total" line and in the result of "pmap -x {pid}" / 1024 - Resource Used

PFM - View name (PFM - Manager name)	Data Sources
Host Swap Used (HOST_SWAP_USED)	SIZE - The "RSS" value in "total" line and in the result of "pmap -x {pid}" / 1024
Unused (UNUSED)	0(Fixed)
Used % (USED_PERCENT)	(USED / SIZE) * 100
Resource Used % (RESOURCE_USED_PERCENT)	(RESOURCE_USED / SIZE) * 100
VM Swap Used % (VM_SWAP_USED_PERCENT)	(VM_SWAP_USED / SIZE) * 100
Host Swap Used % (HOST_SWAP_USED_PERCENT)	(HOST_SWAP_USED / SIZE) * 100
VM Swap IO (VM_SWAP_IO)	--
VM Swap In (VM_SWAP_IN)	--
VM Swap Out (VM_SWAP_OUT)	--
Working Size (WORKING_SIZE)	The "Usedmemory" line in the result of "virsh dominfo {domain}" / 1024
Working Size % (WORKING_SIZE_PERCENT)	(WORKING_SIZE / SIZE) * 100
Share (SHARE)	--
Max (MAX)	The "Max memory" line in the result of "virsh dominfo {domain}"
Min (MIN)	--
Expectation (EXPECTATION)	--
Max % (MAX_PERCENT)	MAX / PI_HMI.SIZE * 100
Min % (MIN_PERCENT)	--
Expectation % (EXPECTATION_PERCENT)	--

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (11) VM Network Status(PI\_VNI)

The following table lists the data sources in each fields of the VM Network Status(PI\_VNI) record.

Table L–39: The data sources in each fields of the VM Network Status(PI\_VNI) record (KVM)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
VM ID (VM_ID)	PD_VM.VM_ID

PFM - View name (PFM - Manager name)	Data Sources
Net ID (NET_ID)	The "interface" value in the result of "virsh dumpxml {domain}" / mac address
VM Host Name (VM_HOST_NAME)	--
VM Name (VM_NAME)	PD_VM.VM_NAME
Sampling Time (SAMPLING_TIME)	date -Iseconds
Rate (RATE)	SEND_RATE + RECV_RATE
Send Rate (SEND_RATE)	( $\Delta$ "RX bytes" value in the result of "ifconfig" / $\Delta$ Collection time) / 1024
Recv Rate (RECV_RATE)	( $\Delta$ "TX bytes" value in the result of "ifconfig" / $\Delta$ Collection time) / 1024

Legend:

$\Delta$  : This time collected value - Last time collected value.

--: The field stores the raw (not altered) value of performance data acquired.

## (12) VM Physical Disk Status(PI\_VPDI)

The following table lists the data sources in each fields of the VM Physical Disk Status(PI\_VPDI) record.

Table L–40: The data sources in each fields of the VM Physical Disk Status(PI\_VPDI) record (KVM)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
VM ID (VM_ID)	PD_VM.VM_ID
Disk ID (DISK_ID)	The character string in the "source file= ' ' " which is inside of the "<disk type='file' device='disk'>" in the result of "dumpxml {domain}"
VM Host Name (VM_HOST_NAME)	--
VM Name (VM_NAME)	PD_VM.VM_NAME
Sampling Time (SAMPLING_TIME)	date -Iseconds
Speed (SPEED)	READ_SPEED + WRITE_SPEED
Read Speed (READ_SPEED)	( $\Delta$ The "rd_bytes" line in the result of "virsh domblkstat {domain} {device}" / $\Delta$ Collection time) / 1024
Write Speed (WRITE_SPEED)	( $\Delta$ The "wr_bytes" line in the result of "virsh domblkstat {domain} {device}" / $\Delta$ Collection time) / 1024
Requests (REQUESTS)	READ_REQUESTS + WRITE_REQUESTS
Read Requests (READ_REQUESTS)	$\Delta$ The "rd_req" line in the result of "virsh domblkstat {domain} {device}" / $\Delta$ Collection time

PFM - View name (PFM - Manager name)	Data Sources
Write Requests (WRITE_REQUESTS)	Δ The "wr_req" line in the result of "virsh domblkstat {domain} {device}" / Δ Collection time
Commands (COMMANDS)	--
Abort Commands (ABORT_COMMANDS)	--
Abort Commands % (ABORT_COMMANDS_PERCENT)	--
Bus Resets (BUS_RESETS)	--

Legend:

Δ : This time collected value - Last time collected value.

--: The field stores the raw (not altered) value of performance data acquired.

## (13) VM Status Detail(PD\_VM)

The following table lists the data sources in each fields of the VM Status Detail(PD\_VM) record.

Table L–41: The data sources in each fields of the VM Status Detail(PD\_VM) record (KVM)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
VM ID (VM_ID)	The "UUID" line in the result of "virsh dominfo {domain}"
VM Host Name (VM_HOST_NAME)	--
VM Name (VM_NAME)	The "Name" column in the result of "virsh list -all"
Status (STATUS)	The "state" line in the result of "virsh dominfo {domain}"
Information (INFORMATION)	The "OS Type" line in the result of "virsh dominfo {domain}"

Legend:

--: The field stores the raw (not altered) value of performance data acquired.

## (14) VM Status(PI\_VI)

The following table lists the data sources in each fields of the VM Status(PI\_VI) record.

Table L–42: The data sources in each fields of the VM Status(PI\_VI) record (KVM)

PFM - View name (PFM - Manager name)	Data Sources
Record Type (INPUT_RECORD_TYPE)	--
Record Time (RECORD_TIME)	--

PFM - View name (PFM - Manager name)	Data Sources
Interval (INTERVAL)	--
VA DeviceID (VADEVICEID)	--
VM ID (VM_ID)	PD_VM.VM_ID
Clocks (CLOCKS)	PI_HCI.CLOCKS * The number of usable CPUs
Count (COUNT)	The "CPU(s)" line in the result of "virsh dominfo {domain}"
VM Host Name (VM_HOST_NAME)	--
VM Name (VM_NAME)	PD_VM.VM_NAME
Sampling Time (SAMPLING_TIME)	date -Iseconds
Used (USED)	CLOCKS * USED_PERCENT / 100
Insufficient (INSUFFICIENT)	--
Request (REQUEST)	--
Host Used % (HOST_USED_PERCENT)	USED / PI.CLOCKS * 100
Used % (USED_PERCENT)	The "QEMU" line and "PID" column in the result of "ps aux" $\Delta$ The "PID" line and "TIME+" column in the result of "top -b -n 1" / ( $\Delta$ Collection time * COUNT)
Insufficient % (INSUFFICIENT_PERCENT)	--
Request % (REQUEST_PERCENT)	--
Used Per Request (USED_PER_REQUEST)	--
Insufficient Per Request (INSUFFICIENT_PER_REQUEST)	--
Affinity (AFFINITY)	The "CPU Affinity" column in the result of "virsh vcpuinfo {domain}"
Share (SHARE)	--
Max (MAX)	CLOCKS
Min (MIN)	--
Expectation (EXPECTATION)	--
Max % (MAX_PERCENT)	100%(Fixed)
Min % (MIN_PERCENT)	--
Expectation % (EXPECTATION_PERCENT)	--

Legend:

$\Delta$  : This time collected value - Last time collected value.

--: The field stores the raw (not altered) value of performance data acquired.

## M. Fields Affected by Setting the PFM - RM for Virtual Machine

The following describes the fields affected by setting described at [2.1.4\(2\) Setting PFM - RM for Virtual Machine](#). An example is shown below and the table shows the different values for each setting.

The example monitoring target is as follows:

VMware: Hyper-Threading is enabled

CPU: Physical processor for 1 core: 2GHz.

Number of physical processor cores: 2

Number of logical processor cores: 4

CPU resources used: 3GHz

Table M–1: Fields affected by PFM - RM for Virtual Machine setup

No.	Record	Field	Affected	Setting UseHTPhysicalClocks	
				If N is specified	If Y is specified
1	Host Status (PI)	Clocks	Y	2GHz * 4 = 8GHz	2GHz * 2 = 4GHz
2		Count	N	2	2
3		Used	N	3GHz	3GHz
4		VMM Used	N	0.5GHz	0.5GHz
5		VM Used	N	3GHz	3GHz
6		VMM Console Used	N	0GHz	0GHz
7		VMM Kernel Used	N	0.3GHz	0.3GHz
8		VMM Others Used	N	VMM Used(0.5GHz) - VMM Console Used(0GHz) - VMM Kernel Used(0.3GHz) = 0.2GHz	VMM Used(0.5GHz) - VMM Console Used(0GHz) - VMM Kernel Used(0.3GHz) = 0.2GHz
9		UnUsed	Y	Clocks(8Ghz) - Used(3GHz) = 5GHz	Clocks(4Ghz) - Used(3GHz) = 1GHz
10		Used %	Y	Used(3GHz) / Clocks(8GHz) = 37.5%	Used(3GHz) / Clocks(4GHz) = 75%
11		VMM Used %	Y	VMM Used(0.5GHz) / Clocks(8GHz) = 6.25%	VMM Used(0.5GHz) / Clocks(4GHz) = 12.5%
12		VM Used %	Y	VM Used(3GHz) / Clocks(8GHz) = 37.5%	VM Used(3GHz) / Clocks(4GHz) = 75%
13		VMM Console Used %	Y	VMM Console Used(0GHz) / Clocks(8GHz) = 0%	VMM Console Used(0GHz) / Clocks(4GHz) = 0%
14		VMM Kernel Used %	Y	VMM Kernel Used(0.3GHz) / Clocks(8GHz) = 3.75%	VMM Kernel Used(0.3GHz) / Clocks(4GHz) = 7.5%
15		VMM Others Used	Y	VMM Others Used(0.2GHz) / Clocks(8GHz) = 2.5%	VMM Others Used(0.2GHz) / Clocks(4GHz) = 5%
16		Unused %	Y	Unused(5GHz) / Clocks(8GHz) = 62.5%	Unused(1GHz) / Clocks(4GHz) = 25%

No.	Record	Field	Affected	Setting UseHTPhysicalClocks	
				If N is specified	If Y is specified
17	VM Status (PI_VI)	Host Used %	Y	Used(3GHz) / PI.Clocks(8GHz) = 37.5%	Used(3GHz) / PI.Clocks(4GHz) = 75%
18		Expection	Y	PI.Clocks(8GHz) * (Expectation %(30%) / 100) = 2.4GHz	PI.Clocks(4GHz) * (Expectation %(30%) / 100) = 1.2GHz

**Legend:**

Y: The field is affected by the setting.

N: The field is not affected by the setting.



## 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

### N.2 Conventions: Abbreviations for product names

This manual uses abbreviated names for products of Hitachi and other companies. The following table lists the abbreviated names and their full names.

Abbreviation			Full name or meaning
AIX			AIX V6.1
			AIX V7.1
HP-UX	HP-UX 11i		HP-UX 11i V3 (IPF)
IPF			Itanium(R) Processor Family
JP1/IM	JP1/IM - Manager		JP1/Integrated Management - Manager
	JP1/IM - View		JP1/Integrated Management - View
JP1/ITSLM			JP1/IT Service Level Management
JP1/NETM/DM			JP1/NETM/DM Client
			JP1/NETM/DM Manager
			JP1/NETM/DM SubManager
Linux	Linux (IPF)	Linux 5 Advanced Platform (IPF)	Red Hat Enterprise Linux(R) 5 Advanced Platform (IPF)
		Linux 5 (IPF)	Red Hat Enterprise Linux(R) 5 (IPF)
	Linux (x64)	Linux 6 (AMD/Intel 64)	Red Hat Enterprise Linux(R) 6 (AMD/Intel 64)

Abbreviation			Full name or meaning
Linux	Linux (x64)	Linux 5 Advanced Platform (AMD/Intel 64)	Red Hat Enterprise Linux(R) 5 Advanced Platform (AMD/Intel 64)
		Linux 5 (AMD/Intel 64)	Red Hat Enterprise Linux(R) 5 (AMD/Intel 64)
	Linux (x86)	Linux 6 (x86)	Red Hat Enterprise Linux(R) 6 (x86)
		Linux 5 Advanced Platform (x86)	Red Hat Enterprise Linux(R) 5 Advanced Platform (x86)
		Linux 5 (x86)	Red Hat Enterprise Linux(R) 5 (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	JP1/Cm2/Network Node Manager 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	
Performance Management			JP1/Performance Management
PFM - Agent	PFM - Agent for Cosminexus		JP1/Performance Management - Agent Option for uCosminexus Application Server
	PFM - Agent for DB2		JP1/Performance Management - Agent Option for IBM DB2
	PFM - Agent for Domino		JP1/Performance Management - Agent Option for IBM Lotus Domino
	PFM - Agent for Enterprise Applications		JP1/Performance Management - Agent Option for Enterprise Applications
	PFM - Agent for Exchange Server		JP1/Performance Management - Agent Option for Microsoft(R) Exchange Server
	PFM - Agent for HiRDB		JP1/Performance Management - Agent Option for HiRDB
	PFM - Agent for IIS		JP1/Performance Management - Agent Option for Microsoft(R) Internet Information Server
	PFM - Agent for JP1/AJS	PFM - Agent for JP1/AJS2	JP1/Performance Management - Agent Option for JP1/AJS2

Abbreviation			Full name or meaning
PFM - Agent	PFM - Agent for JP1/AJS	PFM - Agent for JP1/AJS3	JP1/Performance Management - Agent Option for JP1/AJS3
	PFM - Agent for Microsoft SQL Server		JP1/Performance Management - Agent Option for Microsoft(R) SQL Server
	PFM - Agent for OpenTP1		JP1/Performance Management - Agent Option for OpenTP1
	PFM - Agent for Oracle		JP1/Performance Management - Agent Option for Oracle
	PFM - Agent for Platform	PFM - Agent for Platform (UNIX)	JP1/Performance Management - Agent Option for Platform (UNIX)
		PFM - Agent for Platform (Windows)	JP1/Performance Management - Agent Option for Platform (Windows)
	PFM - Agent for Service Response		JP1/Performance Management - Agent Option for Service Response
	PFM - Agent for Virtual Machine		JP1/Performance Management - Agent Option for Virtual Machine
	PFM - Agent for WebLogic Server		JP1/Performance Management - Agent Option for BEA WebLogic Server
			JP1/Performance Management - Agent Option for Oracle(R) WebLogic Server
PFM - Agent for WebSphere Application Server		JP1/Performance Management - Agent Option for IBM WebSphere Application Server	
PFM - Agent for WebSphere MQ		JP1/Performance Management - Agent Option for IBM WebSphere MQ	
PFM - Base			JP1/Performance Management - Base
PFM - Manager			JP1/Performance Management - Manager
PFM - RM	PFM - RM for Microsoft SQL Server		JP1/Performance Management - Remote Monitor for Microsoft(R) SQL Server
	PFM - RM for Oracle		JP1/Performance Management - Remote Monitor for Oracle
	PFM - RM for Platform	PFM - RM for Platform (UNIX)	JP1/Performance Management - Remote Monitor for Platform (UNIX)
		PFM - RM for Platform (Windows)	JP1/Performance Management - Remote Monitor for Platform (Windows)

Abbreviation		Full name or meaning
PFM - RM	PFM - RM for Virtual Machine	JP1/Performance Management - Remote Monitor for Virtual Machine
PFM - Web Console		JP1/Performance Management - Web Console
Solaris	Solaris 10	Solaris 10 (SPARC)
		Solaris 10 (x64)
		Solaris 10 (x86)
VMware		VMware(R) ESX V3.0
		VMware(R) ESX V3.5
		VMware(R) ESXi V3.5 Embedded
		VMware(R) ESXi V3.5 Installable
		VMware(R) ESX V4.0
		VMware(R) ESXi V4.0 Embedded
		VMware(R) ESXi V4.0 Installable
		VMware(R) ESX 4.1
		VMware vSphere ESXi 5

- PFM - Manager, PFM - Agent, PFM - Base, PFM - Web Console, and PFM - RM may be referred to collectively as *Performance Management*.
- The VMware system physical server, Hyper-V system physical server, and KVM system physical server are sometimes generically referred to as *physical servers*. The VMware system virtual machine, Hyper-V system virtual machine, and KVM system virtual machine are sometimes generically referred to as *virtual machines*.

## N.3 Conventions: Acronyms

This manual also uses the following acronyms:

Acronym	Full name or meaning
CPU	Central Processing Unit
DCOM	Distributed Component Object Model
DHCP	Dynamic Host Configuration Protocol
DMZ	DeMilitarized Zone
DNS	Domain Name System
FQDN	Fully Qualified Domain Name
GMT	Greenwich Mean Time
HA	High Availability

Acronym	Full name or meaning
HBA	Host Bus Adapter
HTML	Hyper Text Markup Language
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Security
IP	Internet Protocol
IPF	Itanium(R) Processor Family
IPv4	Internet Protocol Version 4
IPv6	Internet Protocol Version 6
JST	Japan Standard Time
KVM	Kernel-based Virtual Machine
LAN	Local Area Network
LPAR	Logical Partition
MSDTC	Microsoft Distributed Transaction Coordinator
NAPT	Network Address Port Translation
NAT	Network Address Translation
NIC	Network Interface Card
ODBC	Open Database Connectivity
OS	Operating System
RPM	Redhat Package Manager
SAN	Storage Area Network
SNMP	Simple Network Management Protocol
SSL	Secure Socket Layer
TCP	Transmission Control Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
UAC	User Access Control
UTC	Universal Time, Coordinated
Web	World Wide Web
WMI	Windows Management Instrumentation

## 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	8S <i>instance-number instance-name</i> [hostname]	<i>instance-name</i> [hostname]<RM VirtualMachine>(Store)
	8A <i>instance-number instance-name</i> [hostname]	<i>instance-name</i> [hostname]<RM VirtualMachine>
Service Key	agt8	RMVM

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: Directory names

In general, if a Windows folder name is the same as its counterpart UNIX directory name, it is referred to in this manual by its UNIX directory name.

## N.6 Conventions: Installation folder

The default installation folder for the Windows version of Performance Management is as follows:

Installation-folder for PFM - Base:

- For Windows Server 2003 (x64), the 64-bit version of Windows Server 2008 and Windows Server 2012:  
`system-drive\Program Files(x86)\Hitachi\jplpc`
- For other OSs:  
`system-drive\Program Files\Hitachi\jplpc`

This manual uses the term *installation folder* for the PFM - Base installation folder.

Installation-folder for PFM - Management:

- For Windows Server 2003 (x64), the 64-bit version of Windows Server 2008 and Windows Server 2012:  
`system-drive\Program Files(x86)\Hitachi\jplpc`
- For other OSs:  
`system-drive\Program Files\Hitachi\jplpc`

Installation-folder for PFM - Web Console:

- For Windows Server 2003 (x64), the 64-bit version of Windows Server 2008 and Windows Server 2012:  
`system-drive\Program Files(x86)\Hitachi\jplpcWebCon`
- For other OSs:  
`system-drive\Program Files\Hitachi\jplpcWebCon`

## N.7 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.8 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<sup>2</sup> bytes.
- 1 GB (gigabyte) is 1,024<sup>3</sup> bytes.
- 1 TB (terabyte) is 1,024<sup>4</sup> bytes.

## O. Glossary

---

### action

Performance Management automatically executes an action when monitored data reaches a threshold. The following types of actions are available:

- Email transmission
- Command execution
- SNMP trap generation
- JP1 event generation

### Action Handler

This is one of the PFM - Manager or PFM - Base services. This service executes an action.

### agent

Refers to PFM - RM, which collects performance data.

### alarm

Information that defines the action that is to be taken or the event message that is issued when monitored data reaches a threshold.

### alarm table

A table summarizing one or more alarms that define the following types of information:

- Monitored object (process, TCP, Web service, for example)
- Monitored information (CPU usage, the number of bytes received in 1 second, for example)
- Monitored condition (threshold)

### binding

Binding means associating an alarm with an agent. When an alarm is bound, the user can be notified when the performance data collected by the agent reaches the threshold defined by the alarm.

### cluster system

A cluster system links together multiple server systems and operates them as a single system.

In this manual, *cluster system* refers to an HA cluster system unless otherwise specified.

See *HA cluster system*.

### Correlator

This is one of the PFM - Manager services. This service controls event delivery between services. It evaluates an alarm status, and when the threshold is exceeded, sends an alarm event and an agent event to both the Trap Generator service and PFM - Web Console.

### data model

Generally refers to the records and fields that each PFM - RM has. Data models are managed by version.



## database ID

An ID assigned to each record of PFM - RM to indicate the database in which each record is stored. A database ID indicates the type of records that are stored in the database.

- PI: Indicates a database for storing records of the PI record type.
- PD: Indicates a database for storing records of the PD record type.

## drilldown report

This is a report associated with a report or report field, and is used for displaying detailed information or related information about a report.

## executing node

In server systems that comprise a cluster system, the node that is executing a job (the node on which the logical host is active).

## failover

A process of switching over the processing of the server that is executing jobs from the executing node to the standby node when an error occurs in a cluster system.

## field

Collection of performance data comprising a record.

## function ID

This is a 1-byte identifier indicating a function type of a Performance Management program, and is part of a service ID.

## HA cluster system

A cluster system for achieving high availability, designed to continue running even when an error occurs. When an error occurs on a server that is processing jobs, another server that has been on standby takes over job processing. In this way, jobs are not interrupted by an error and system availability is improved.

In this manual, *cluster system* refers to an HA cluster system unless otherwise specified.

## historical report

A report that shows the status history of the monitored target.

## instance

In this manual, the term *instance* is used in the following ways:

- To indicate a recording format for records  
A record that is recorded on one line is referred to as a *single-instance record*, a record that is recorded on multiple lines is referred to as a *multi-instance record*, and each line in a record is referred to as an *instance*.
- To indicate the PFM - RM startup method  
When a single agent monitors targets on the same host, it is referred to as a *single-instance agent*. When multiple agents monitor targets on the same host, they are referred to as *multi-instance agents*. Each of these multi-instance agents is referred to as an *instance*.

**instance number**

This is an identifier that indicates a 1-byte control number used in internal processing, and that is part of a service ID.

**JP1/ITSMLM**

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/ITSMLM can enhance monitoring of the operating status.

**lifetime**

A period during which the consistency of the performance data collected into records can be guaranteed.

**logical host**

This is the logical server that becomes the executing environment for JP1 when it operates in a cluster system. When an error occurs, systems are switched on a logical host basis.

A logical host has its own IP address, and this IP address is inherited during a failover. Therefore, even when physical servers are switched because of an error, clients can use the same IP address to access the server, making it appear as though a single server is always running.

**management tools**

Management tools are various types of commands and GUI functions that are used to check service status and processing performance data. They can be used to perform the following types of operations:

- Displaying service configuration and status
- Saving and restoring performance data
- Exporting performance data to a text file
- Erasing performance data

**Master Manager**

This is one of the PFM - Manager services, and refers to PFM - Manager's main service.

**Master Store**

This is one of the PFM - Manager services, and refers to the service that manages alarm events issued by each PFM - RM. The Master Store service uses a database for retaining event data.

**monitoring template**

Refers to a pre-defined alarm or report provided in PFM - RM. By using a monitoring template, you can easily prepare to monitor the operation status of PFM - RM without having to create complex definitions.

**multi-instance record**

A record that is recorded on multiple lines. This record has a specific ODBC key field.

See *Instance*.

**Name Server**

A PFM - Manager service that manages the service configuration information in the system.

## ODBC key field

Indicates the ODBC key field that is necessary so that PFM - Manager or PFM - Base can use an SQL to utilize the record data stored in the Store database. Some ODBC key fields are common to all records, while others are specific to individual records.

## PD record type

See *Product Detail record type*.

## performance data

Operation status data of a resource collected from the monitored system.

## Performance Management

A general term that refers to a group of software program products necessary for monitoring and analyzing performance-related problems of a system. 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 comprising Performance Management. PFM - Agent is equivalent to a system monitoring function, and various types of PFM - Agents are available according to the application to be monitored, the database, and the OS. PFM - Agent has the following functions:

- Monitoring the monitored target
- Collecting and recording data from a monitored target

## PFM - Base

One of the program products comprising Performance Management. PFM - Base provides Performance Management with the core functions necessary for monitoring operations. PFM - Base is a prerequisite program product for running PFM - RM. PFM - Base has the following functions:

- Management tools such as various types of commands
- Common functions necessary for linking Performance Management to other systems

## PFM - Manager

One of the program products comprising Performance Management. PFM - Manager is equivalent to the manager function and has the following functions:

- Management of the Performance Management program products
- Event management

## PFM - Manager name

Name that identifies a field stored in the Store database, and that is used to specify a field for a command, for example.

## 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 operating system to be monitored. PFM - RM provides the following features:

- Performance monitoring of target objects
- Collection and recording of data from monitored objects

## PFM - View name

Alias for the PFM - Manager name. The PFM - View name is a more intuitive name than the PFM - Manager name. For example, the PFM - Manager name `INPUT_RECORD_TYPE` becomes Record Type as a PFM - View name. The PFM - View name is used to specify a field in the GUI of PFM - Web Console, for example.

## PFM - Web Console

One of the program products comprising Performance Management. It provides Web application server functions for centrally monitoring the Performance Management system. PFM - Web Console has the following functions:

- GUI display
- Integrated monitoring and management functions
- Report definition and alarm definition

## physical host

An environment specific to each server that makes up a cluster system. A physical host's environment is not inherited by another server during a failover.

## physical server

This is a physical server on which a virtual environment operates, and it has various types of resources such as a CPU. Virtual machines on the same physical server share the physical server's resources.

## PI record type

See *Product Interval record type*.

## Product Detail record type

This record type stores performance data that indicates the system status at a given point in time, such as detailed information about the process that is currently active. Use the PD record type when you want to know the system status at a given point in time, such as the following:

- The system's operation status
- The capacity of the file system currently being used

## product ID

This is a one-byte identifier that indicates the program product of Performance Management to which the service of the applicable Performance Management program belongs, and that is part of a service ID.

## Product Interval record type

This record type stores performance data for a given period of time (interval), such as the number of processes for 1 minute. Use the PI record type when you want to analyze changes or trends in the system status over time, such as the following:

- Trends in the number of system calls that occurred within a specified period of time
- Trends in the capacity of the file system being used

## real-time report

A report that indicates the current status of the monitored target.

## record

A format for storing collected performance data. The record type varies according to each database in the Store database.

## 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 - Remote Monitor platform.

## report

A report defines how performance data collected by PFM - RM is graphically displayed. It primarily defines the following types of information:

- Records to be displayed in a report
- Performance data display items
- Performance data display format (table, graph, and so on)

## service ID

A unique ID assigned to a Performance Management program. When you use a command to check the system configuration of Performance Management, or when you back up the performance data of each agent, you need to execute the command by specifying the service ID of the Performance Management program. The service ID format varies depending on the settings of the product name display function. For details about the service ID format, see the chapter that explains the functions of Performance Management in the *Job Management Partner 1/Performance Management Planning and Configuration Guide*.

## single-instance record

A record that is recorded on a single line. This record does not have a specific ODBC key field.

See *Instance*.

## stand-alone mode

This is a status in which PFM - RM only has started. Even when the Master Manager service or Name Server service of PFM - Manager cannot be started because of an error, you can start PFM - RM by itself and collect performance data.

**standby node**

In server systems that comprise a cluster system, a standby node can assume the jobs that were being executed by the executing node when an error occurred on it.

**status management function**

This function manages the status of all services running on PFM - Manager and PFM - RM. Using the status management function, the system administrator can accurately assess the service startup or stoppage status on each host, and can therefore take the appropriate corrective actions quickly.

**Store database**

This database stores the performance data collected by Remote Monitor Collector service.

**virtual machine**

This refers to a virtual machine that is provided by software and that uses virtual resources provided in the resources of a physical server.

**virtual machine monitor**

See *VMM*.

**VMM**

Stands for Virtual Machine Manager, which is the kernel for controlling virtual machines.

**VMM console**

This is the console for operating VMM.

**VMM kernel**

This is the kernel portion of VMM.

**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.

# Index

## A

- abbreviations for products 533
- acronyms 536
- action 25, 540
- Action Handler 382, 540
- action log data
  - outputting 474
  - setting up, output 106, 196
- agent 227, 540
- agent event 344
- alarm 25, 540
  - format of explanations 213
  - Host Disk Usage 215
  - Host Memory Usage 217
  - list 214
  - VM CPU Insufficient 219
  - VM Disk Abort Cmds 221
  - VM Disk Usage 223
  - VM Status 225
- alarm table 25, 540
- alias name 76

## B

- backing up 177
- baseline, selecting 31, 50, 63
- binding 25, 540

## C

- certificate
  - updating (VMware ESX) 124
- certificate, embedding 104, 195
- cluster software
  - confirming startup and stop from 198
  - deleting PFM - RM registration from 204
  - registering PFM - RM for Virtual Machine in 197
  - stopping programs and services from 202
- cluster system 182, 540
  - deleting port number setting 202
  - failover 184
  - installation and setup 186
  - installation and setup flow 189
  - installation procedure 190
  - operations in 181
  - overview of 182

- setting up environment of 199
- setting up logical hosts of other Performance Management programs 194
- setting up monitoring targets 194
- setting up WMI 196
- setup procedure 191
- uninstallation and unsetup 200
- uninstallation and unsetup flow 200
- uninstallation procedure 205
- unsetting up logical hosts of other Performance Management programs 203
- unsetup procedure 201
- collected log 390, 392
- command execution 25, 378
- commands 90
  - hostname 187
  - jpccconf agent setup 90, 91
  - jpccconf db define 116
  - jpccconf ha export 196, 203
  - jpccconf ha import 197, 204
  - jpccconf ha list 193, 202
  - jpccconf ha setup 193, 198
  - jpccconf ha unsetup 203
  - jpccconf inst list 112
  - jpccconf inst setup 194, 420
  - jpccconf inst unsetup 112, 203
  - jpccconf mgrhost define 106, 193
  - jpccconf port 195, 202
  - jpccconf target setup 194
  - jpccras 393, 399
  - jpccspm start 379
  - jpctool alarm (jpcalarm) 478
  - jpctool db dump 382, 408
  - jpctool db dump (jpcctrl dump) 378
  - jpctool service delete 110, 382
  - jpctool service list 110, 408
  - jpctool service list (jpcctrl list) 378
  - jpctool service sync 110
- common message log 389, 390
- conventions
  - abbreviations for products 533
  - acronyms 536
  - diagrams 9
  - directory names 538
  - fonts and symbols 9

KB, MB, GB and TB 539  
product names, service ids, and service keys 537  
version numbers 10

#### Conventions

installation folder 538

Correlator 413, 540

CPU resource, monitoring 32, 50, 63

## D

database ID 421, 541

data collected when problem occurs 393

data collection command

executing 398

executing (in logical host environment) 399

data collection method 398

data model 24, 277, 540

data type list 285

delta 280

diagram conventions 9

differences in performance data collection from PFM -  
Agent for Virtual Machine 30

directory names 538

disk occupancy 404

disk resources, monitoring 40, 55, 68

drilldown report 541

field level 227

## E

error handling procedure 376, 377

executing node 541

## F

failover 182, 541

field 24, 227, 541

field value 286

firewall passage direction 407

font conventions 9

function ID 98, 541

## G

GB meaning 539

## H

HA cluster system 182, 541

historical report 24, 541

Hyper-V

notes on collecting records 291

setting up instance environment and monitoring  
targets 170

Hyper-V, note about virtual machine name for 291

## I

identifiers, list of 405

installation and setup flow 86

installation folder conventions 538

installation procedure 87

instance 23, 541

instance environment

setting up 93, 194

updating 117

updating settings of 207

instance environments

examples of setting up 167

instance name 98

instance number 98, 542

IP address, setting 76

IPv6

settings for using 77

## J

JP1/ITSLM 542

JP1 system event 344

## K

KB meaning 539

KVM

notes on collecting records 291

setting up instance environment and monitoring  
targets 173

## L

lifetime 279, 542

list of

files and folders 426

log files and folders 390

messages output to Windows event log 346

log file size, changing 105, 195

logical host 183, 186, 542

logical host environment definition file

copying, to standby node 196, 204

exporting 196, 203

exporting and importing 209



importing 197, 204  
log information 389

## M

machine's host name, changing 379  
management tools 542  
Master Manager 382, 542  
Master Store 380, 542  
MB meaning 539  
memory requirement 404  
memory resource, monitoring 36, 54, 66  
message 338, 347  
    description format 340  
    format 339  
    output destinations 341  
    output format 339  
monitoring targets  
    examples of setting up 167  
    setting up (cluster system) 194  
    updating 208  
monitoring template 25, 211, 212, 542  
    overview of 212  
multi-instance record 278, 542

## N

Name Server 542  
network, setting up 105, 195  
network resources, monitoring 46, 59, 70  
non-interactive (command) 546  
notes  
    on collecting KVM and Hyper-V records 291

## O

obtaining certificate 124  
ODBC key field 278, 543  
    list 281  
operation status log 389

## P

PD record type 543  
performance data 19, 23, 543  
    changing storage destination of 105, 116, 196  
    collecting and managing 27  
    collection method 27  
    management method 27  
performance data collection

    differences from PFM - Agent for Virtual Machine 30  
Performance Management 27, 543  
    detecting problems 401  
    notes on installation and setup of multiple programs  
    on same host 83  
    recovering from errors 402  
performance monitoring, system resources that are  
important for  
    Hyper-V system 50  
    KVM system 63  
    VMware system 31  
PFM - Agent 543  
PFM - Base 543  
PFM - Manager 543  
    deleting settings from 113, 205  
    setting up, at connection destination 193  
PFM - Manager name 279, 543  
PFM - RM 27, 544  
PFM - RM for Virtual Machine  
    changing operation method 116, 207  
    changing system configuration 115, 206  
    copying setup files 91  
    example of performance monitoring operation using  
    (for Hyper-V) 50  
    example of performance monitoring operation using  
    (for KVM) 63  
    example of performance monitoring operation using  
    (for VMware) 31  
    features of 23  
    installing and setting up 75, 76  
    overview of 18  
    procedure for setting up 89  
    properties 412  
    purpose of performance monitoring using 19  
    registering 90, 192  
    setting up logical host of 193  
    setting up PFM - Manager at connection destination  
    of 106  
    uninstalling and unsetting up 110  
    unsetting up logical host of 202  
PFM - RM host 79  
PFM - View name 279, 544  
PFM - Web Console 544  
physical host 187, 544  
physical server 544  
PI record type 544  
port numbers  
    list of 407

- of PFM - RM for Virtual Machine [407](#)
- setting [78](#)
- prerequisite programs [79](#)
- processes, list of [406](#)
- Product Detail record type [24](#), [544](#)
- product ID [544](#)
- Product Interval record type [24](#), [545](#)
- product names conventions [537](#)

## R

- real host name [76](#)
- real-time report [24](#), [545](#)
- record [227](#), [545](#)
  - format of explanations [278](#)
- records [24](#), [276](#)
  - Host CPU Status (PI\_HCI) [293](#)
  - Host Logical Disk Status (PI\_HLDI) [296](#)
  - Host Memory Status (PI\_HMI) [298](#)
  - Host Network Status (PI\_HNI) [302](#)
  - Host Physical Disk Status (PI\_HPDI) [304](#)
  - Host Status (PI) [309](#)
  - Host Status Detail (PD) [307](#)
  - list of [292](#)
  - notes on [290](#)
  - types of [24](#)
  - VM CPU Status (PI\_VCI) [314](#)
  - VM Logical Disk Status (PI\_VLDI) [318](#)
  - VM Memory Status (PI\_VMI) [320](#)
  - VM Network Status (PI\_VNI) [325](#)
  - VM Physical Disk Status (PI\_VPDI) [328](#)
  - VM Status (PI\_VI) [333](#)
  - VM Status Detail (PD\_VM) [331](#)
- related publications [533](#)
- Remote Monitor Collector [545](#)
  - property list [414](#)
  - service [98](#)
- Remote Monitor Store [545](#)
  - property list [412](#)
  - service [98](#)
- report [545](#)
  - format of explanations [227](#)
  - organization of report folders [228](#)
- reports [24](#)
  - Host CPU Used Status (Monthly Trend) [231](#)
  - Host CPU Used Status (Status Reporting/Daily Trend) [232](#)

- Host CPU Used Status (Troubleshooting/Real-Time) [233](#)
- Host CPU Used Status (Troubleshooting/Recent Past) [234](#)
- Host Disk I/O (Troubleshooting/Real-Time) [235](#)
- Host Disk I/O (Troubleshooting/Recent Past) [236](#)
- Host Disk Used (Monthly Trend) [237](#)
- Host Disk Used (Status Reporting/Real-Time) [238](#)
- Host Disk Used Status (Troubleshooting/Real-Time) [239](#)
- Host Memory Size (Troubleshooting/Real-Time) [240](#)
- Host Memory Size (Troubleshooting/Recent Past) [241](#)
- Host Memory Used (Monthly Trend) [242](#)
- Host Memory Used (Status Reporting/Daily Trend) [243](#)
- Host Memory Used (Troubleshooting/Real-Time) [244](#)
- Host Memory Used (Troubleshooting/Recent Past) [245](#)
- Host Memory Used Status (Troubleshooting/Real-Time) [246](#)
- Host Memory Used Status (Troubleshooting/Recent Past) [247](#)
- Host Network Data (Monthly Trend) [248](#)
- Host Network Data (Troubleshooting/Real-Time) [249](#)
- list of [230](#)
- VM CPU Allocation Value (Troubleshooting/Real-Time) [250](#)
- VM CPU Allocation Value (Troubleshooting/Recent Past) [251](#)
- VM CPU Insufficient (Monthly Trend) [252](#)
- VM CPU Insufficient (Status Reporting/Daily Trend) [253](#)
- VM CPU Insufficient (Troubleshooting/Real-Time) [254](#)
- VM CPU Insufficient (Troubleshooting/Recent Past) [255](#)
- VM CPU Used (Troubleshooting/Real-Time) [256](#)
- VM CPU Used (Troubleshooting/Recent Past) [257](#)
- VM CPU Used Status (Troubleshooting/Recent Past/Drilldown Only) [258](#)
- VM Disk Abort Commands (Monthly Trend) [259](#)
- VM Disk Abort Commands (Status Reporting/Real-Time) [260](#)
- VM Disk I/O (Troubleshooting/Real-Time) [261](#)
- VM Disk I/O (Troubleshooting/Recent Past) [262](#)
- VM Disk Used (Monthly Trend) [263](#)
- VM Disk Used (Status Reporting/Real-Time) [264](#)

VM Disk Used Status (Troubleshooting/Real-Time) 265

VM Memory Allocation Value (Troubleshooting/Real-Time) 266

VM Memory Allocation Value (Troubleshooting/Recent Past) 267

VM Memory Used (Troubleshooting/Recent Past/Drilldown Only) 268

VM Memory Used Status (Troubleshooting/Recent Past/Drilldown Only) 269

VM Network Data (Monthly Trend) 270

VM Network Data (Troubleshooting/Real-Time) 271

VM Swap Used (Troubleshooting/Real-Time) 272

VM Swap Used (Troubleshooting/Recent Past) 273

VM Working Size - Total (Troubleshooting/Real-Time) 274

VM Working Size - Total (Troubleshooting/Recent Past) 275

restoring 178

## S

sequential file method 391

service control manager 379

service ID 98, 545

service ids conventions 537

service keys conventions 537

settings for using IPv6 77

setting up instance environment and monitoring targets, examples of 167

for VMware 167, 170, 173

setup command, executing 91

shared disk 186

bringing, online 192, 202

taking, offline 197, 204

single-instance record 545

SSH connection settings 107

stand-alone mode 474, 545

standby node 546

status management function 401, 546

Store database 24, 546

fields that are added only when record is recorded in 288

summary rules 282

Supported NNM products 539

swap 36

swapping 36

symbol conventions 9

system log 389

system requirements, estimating 404

## T

TB meaning 539

threshold 25

trace log 390, 391

troubleshooting 378

## U

uninstallation procedure 113

unsetup procedure 111

updating

monitoring targets 208

## V

version compatibility 473

version number conventions 10

version upgrading, notes on 84

virtual CPU 32, 50, 63

virtual environment 19, 23

virtual environment, required settings for  
for Hyper-V 136

for KVM 159

for VMware 123

virtual machine 546

virtual machine monitor 546

virtual memory 36

virtual NIC 46, 59

VMM 546

VMM console 546

VMM kernel 546

VMware

setting up instance environment and monitoring targets 167

VMware ESX 3.5

importing default certificate for 128

VMware ESX

updating certificate 124

## W

Web browser, settings for using to reference manual 179

Windows firewall settings, checking 158

Windows MSCS 197

WMI, setting 106

WMI connection

checking status of [152](#)  
setting up [136](#)  
wrap-around file method [391](#), [392](#)