

Hitachi Tuning Manager v8.1.3-01 Release Notes

Contents

Contents	1
About this document.....	1
Intended audience.....	1
Getting help	2
About this release	2
Product package contents.....	2
New features and important enhancements	3
System requirements.....	4
Resolved problems	4
Known problems	8
Installation precautions.....	8
Upgrade precautions.....	9
Removal precautions	11
Usage precautions.....	12
Temporary restrictions.....	28
Documentation	30
Copyrights and licenses	32

About this document

This document (RN-00HS262-62, April 2015) provides late-breaking information about Hitachi Tuning Manager v8.1.3-01. It includes information that was not available at the time the technical documentation for this product was published, as well as a list of known problems and solutions.

Intended audience

This document is intended for customers and Hitachi Data Systems partners who license and use Hitachi Tuning Manager.

Getting help

The Hitachi Data Systems Support Center staff is available 24 hours a day, seven days a week. To reach us, please visit the support website at <https://portal.hds.com> for current telephone numbers and other contact information. If you purchased this product from an authorized HDS reseller, contact that reseller for support.

About this release

Hitachi Tuning Manager is being released to maintain consistent release numbering with a new release of Hitachi Tuning Manager.

This release is a major release that adds new features and resolves multiple known problems.

Product package contents

Medium	Components	Revision	Release Type	Prerequisite version of Service Pack
Software	Hitachi Tuning Manager	8.1.3-00	Full Package	-
	Hitachi Tuning Manager - Agent for Server System	8.1.3-00	Full Package	-
	Hitachi Tuning Manager - Agent for Oracle	8.1.2-00	Full Package	-
	Hitachi Tuning Manager - Agent for RAID	8.1.3-01	Full Package	-
	Hitachi Tuning Manager - Agent for Network Attached Storage	8.1.3-00	Full Package	-
	Hitachi Tuning Manager - Agent for SAN Switch	8.1.3-00	Full Package	-
	Hitachi Tuning Manager - Agent for Microsoft(R) SQL Server	8.1.0-00	Full Package	-
	Hitachi Tuning Manager - Agent for IBM DB2	8.1.2-00	Full Package	-
	Hitachi Tuning Manager - Agent for Enterprise Applications	8.1.3-00	Full Package	-
Documents	Hitachi Command Suite Tuning Manager Installation Guide	MK-96HC141-27		
	Hitachi Command Suite Tuning Manager Server Administration Guide	MK-92HC021-38		
	Hitachi Command Suite Tuning Manager Agent Administration Guide	MK-92HC013-36		
	Hitachi Command Suite Tuning Manager Application Reports	MK-95HC113-18		

	Reference	
	Hitachi Command Suite Tuning Manager User Guide	MK-92HC022-39
	Hitachi Command Suite Tuning Manager Hardware Reports Reference	MK-95HC111-25
	Hitachi Command Suite Tuning Manager Operating System Reports Reference	MK-95HC112-18
	Hitachi Command Suite Tuning Manager Messages	MK-95HC114-27
	Hitachi Command Suite Tuning Manager CLI Reference Guide	MK-96HC119-27
	Hitachi Command Suite Tuning Manager Getting Started Guide	MK-96HC120-23
	Hitachi Command Suite Tuning Manager API Reference Guide	MK-92HC218-04

New features and important enhancements

For 8.1.3-01

None

For 8.1.3-00

#	New Features and Enhancements	Applied products	Applied OS
1	<p>The following Brocade switches are now supported as monitoring targets:</p> <ul style="list-style-type: none"> - Brocade 5410 - Brocade 5424 - Brocade 5430 - Brocade 5431 - Brocade 5432 - Brocade 5450 - Brocade 5470 - Brocade 5480 - Brocade M6505 - Brocade 6520 - Brocade 6546 - Brocade 6547 - Brocade 6548 - Brocade 7600 - Brocade 7840 	Agent for SAN Switch	All ¹

	- Brocade VA-40FC - Brocade Encryption Switch		
2	The following Cisco switches are now supported as monitoring targets: - Cisco MDS 9148 - Cisco MDS 9250i - Cisco MDS 9706 - Cisco MDS 9710 - Cisco Nexus 5624Q - Cisco Nexus 5672UP - Cisco Nexus 5696Q - Cisco Nexus 56128P	Agent for SAN Switch	All ¹
3	The following Brocade required program is now supported. - Brocade Network Advisor 11.3.x	Agent for SAN Switch	All ¹
4	The following Cisco required program is now supported. - DCNM-SAN 7.1(x)	Agent for SAN Switch	All ¹
5	The following storage systems are now supported as monitoring targets: - VSP G600 (Firmware version: v01) - VSP G400 (Firmware version: v01) - VSP G200 (Firmware version: v01)	Tuning Manager server Agent for Server System Agent for RAID	All ¹
6	We supported new data store format "Hybrid Store" as a database that stores a performance data collected by Agent for RAID.	Agent for RAID	All ¹

Note1: Applies to all supported operating systems

System requirements

The system requirements for Tuning Manager can be found in *Hitachi Command Suite System Requirements (MK-92HC209)*.

Resolved problems

For 8.1.3-01

- Tuning Manager server
None

- Tuning Manager agents
None

For 8.1.3-00

- Tuning Manager server

None

- Tuning Manager agents

#	Resolved Problems	Applied products	Applied OS
1	<p>The value of the following field will be different from the actual performance value:</p> <ul style="list-style-type: none"> -Record: HNAS Node Summary (PI_HNS) -Field: File System Data Transfer Rate <p>[Value that should be output]: The sum total of the read transfer rate and write transfer rate</p> <p>[Incorrect value that is output]: A value that is double the read transfer rate</p> <p>-Location:</p> <ol style="list-style-type: none"> 1) A report displayed in the report window of Performance Reporter. 2) A report output by using the jpccrpt command of Performance Reporter. 3) An export result from the jpccctrl dump command. <p>This problem may occur when all of the following conditions are met:</p> <ol style="list-style-type: none"> 1) HNAS is monitored by Agent for NAS. 2) Display or output the performance values described in above. 	Agent for NAS	All ¹
2	<p>The values of the following fields become the sum total of all HNAS Nodes that belong to the same cluster:</p> <ul style="list-style-type: none"> -Record: HNAS Node Summary (PI_HNS) -Field: File System Total Ops/sec File System Data Transfer Rate <p>-Location:</p> <ol style="list-style-type: none"> 1) A report displayed in the report window of Performance Reporter. 2) A report output by using the jpccrpt command of Performance Reporter. 3) An export result from the jpccctrl dump command. <p>This problem may occur when all of the following conditions are met:</p> <ol style="list-style-type: none"> 1) HNAS is monitored by Agent for NAS. 	Agent for NAS	All ¹

	<p>2) The monitoring targets include a HNAS Node with a cluster configuration.</p> <p>3) Display or output the performance values described in above.</p>		
3	<p>Information for System Drives whose statuses are different between HNAS Nodes that belong to the same cluster is not displayed:</p> <p>-Record: HNAS System Drive Configuration (PD_HSDC)</p> <p>-Location:</p> <ol style="list-style-type: none"> 1) A report displayed in the report window of Performance Reporter. 2) A report output by using the jpccrpt command of Performance Reporter. 3) An export result from the jpccctrl dump command. <p>This problem may occur when all of the following conditions are met:</p> <ol style="list-style-type: none"> 1) HNAS is monitored by Agent for NAS. 2) The monitoring targets include a HNAS Node with a cluster configuration. 3) Display or output the performance values described in above. 	Agent for NAS	All ¹
4	<p>Some EVS information is duplicated and output to the following record:</p> <p>-Record: HNAS EVS Configuration (PD_HEC)</p> <p>-Location:</p> <ol style="list-style-type: none"> 1) A report displayed in the report window of Performance Reporter. 2) A report output by using the jpccrpt command of Performance Reporter. 3) An export result from the jpccctrl dump command. <p>This problem may occur when all of the following conditions are met:</p> <ol style="list-style-type: none"> 1) HNAS is monitored by Agent for NAS. 2) The monitoring targets include a HNAS Node with a cluster configuration. 3) Display or output the performance values described in above. 	Agent for NAS	All ¹
5	<p>The value of %CVS in the alarm message text may be incorrect.</p> <p>This problem will be fixed with the following alarms:</p> <p>PFM RAID Solution Alarms [HUS100/AMS] 8.80</p> <ul style="list-style-type: none"> - Cache Write Pending - Drive Busy Rate - PG Write Hit Rate 	Agent for RAID	All ¹

	<p>PFM RAID Solution Alarms [USP V/USP] 8.80</p> <ul style="list-style-type: none"> - CHP Busy Rate - DKP Busy Rate - PG Read Hit Rate <p>PFM RAID Solution Alarms [VSP G1000/VSP/VSP Gx00/HUS VM] 8.80</p> <ul style="list-style-type: none"> - MP Blade Busy Rate - PG Read Hit Rate <p>This problem may occur when all of the following conditions are met:</p> <p>1) Copy one of the following solution set alarms, and edit the alarm condition:</p> <p>PFM RAID Solution Alarms [HUS100/AMS] 8.60</p> <ul style="list-style-type: none"> - Cache Write Pending - Drive Busy Rate - PG Write Hit Rate <p>PFM RAID Solution Alarms [USP V/USP] 8.60</p> <ul style="list-style-type: none"> - CHP Busy Rate - DKP Busy Rate - PG Read Hit Rate <p>PFM RAID Solution Alarms [VSP G1000/VSP/HUS VM] 8.60</p> <ul style="list-style-type: none"> - MP Blade Busy Rate - PG Read Hit Rate <p>2) 3 or more alarm conditions exists in the alarm.</p> <p>3) Bind the alarm to the Agent, and start monitoring.</p>		
6	<p>The value of %CVS in the alarm message text may be incorrect.</p> <p>This problem will be fixed with the following alarms:</p> <p>PFM NAS Template Alarms [HNAS] 8.13</p> <ul style="list-style-type: none"> - File System Free % - Storage Pool Free % <p>This problem may occur when all of the following conditions are met:</p> <p>1) Copy one of the following solution set alarms, and edit the alarm condition:</p> <p>PFM NAS Template Alarms [HNAS] 8.00</p> <ul style="list-style-type: none"> - File System Free % - Storage Pool Free % <p>2) 3 or more alarm conditions exists in the alarm.</p> <p>3) Bind the alarm to the Agent, and start monitoring.</p>	Agent for NAS	All ¹

Note1: Applies to all supported operating systems

Known problems

- Tuning Manager server
None
- Tuning Manager agents
None

Resolved known problems

For 8.1.3-00

None

Installation precautions

- Tuning Manager server

#	Installation Precautions	Applied products	Applied OS
1	After installing the Tuning Manager server 8.1.3, if the database of the Tuning Manager server which had been exported on version 6.0.0 to 6.4.0 was imported, the Tuning Manager server might take approximately 1 hour to start at the first time after the import.	Tuning Manager server	All ¹
2	After an installation or removal, shortcut folder named "programs" might be incorrectly created under the Windows Start menu. This symptom is temporary, and this shortcut folder will no longer appear after you log off and log on to Windows.	Tuning Manager server	Windows
3	If the following message is recorded in the Common Component installation log file, the installation file is registered to be updated as a pending file for next start up. Restart the server machine, and then start the installer again. Log file location: <system drive> File name: hcmdsist.log ----- [hh:mm:ss] Installation result: [hh:mm:ss] 02 -----	Tuning Manager server	Windows
4	The following library was added as a prerequisite library for Red Hat Enterprise Linux 6.5. Apply this patch if you use Red Hat Enterprise Linux 6.5. - upstart-0.6.5-13.el6_5.3.x86_64 or later	Tuning Manager server	Linux

Note1: Applies to all supported operating systems

- Tuning Manager agents

#	Installation Precautions	Applied products	Applied OS
1	<p>If you install the Tuning Manager agent version 7.4.1 or earlier in an environment that already contains a Tuning Manager agent product of version 7.5.0 or later, the following items are displayed in the Start menu:(*)</p> <ul style="list-style-type: none"> - Administrator Console - Administrator Console - HTnM <p>(*)Coexistence of these menu items does not affect program operations. Use either of them to start Administrator Console.</p>	Tuning Manager agents	Windows

Upgrade precautions

- Tuning Manager server

#	Upgrade Precautions	Applied products	Applied OS
1	<p>If you upgraded the Tuning Manager server from version 6.0.0 to 6.4.0 to version 8.1.3, the Tuning Manager server might take approximately 1 hour to start at the first time after upgrade.</p>	Tuning Manager server	All ¹
2	<p>If following products are installed, upgrade them to 8.0.0 or later.</p> <ul style="list-style-type: none"> - Device Manager - Tiered Storage Manager - Replication Manager - Tuning Manager - Compute Systems Manager - Global Link Manager 	Tuning Manager server	All ¹
3	<p>If you upgrade Hitachi Command Suite products from 7.6.1 or earlier to 8.0.0 or later, confirm the following services are running in the Services window in Windows. If both or one of them is not running, start them.</p> <ul style="list-style-type: none"> - HiRDB/EmbeddedEdition _HD0 - HiRDB/EmbeddedEdition _HD1 <p>Upgrade Installation fails message with KATN00231-E if both or one of them is not running.</p> <p>KATN00231-E An attempt to start the HiRDB database has failed. Processing will be stopped.</p>	Tuning Manager server	Windows
4	<p>About the lapse of time for upgrade installation.</p> <p>When upgrading the version from 7.6.1 or earlier to 8.0.0 or later, the upgrade installation may take a long time to</p>	Tuning Manager server	All ¹

move the place of database from 32 bit to 64 bit. The estimate time for the upgrade installation depends on the size of the database. The following shows criterion of a configuration with which might take more than three hours for the installation of Hitachi Command Suite products.

An environment of installation

CPU: vCPU * 2 (4GHz)

HDD: SATA drive 7200rpm 1TB

The estimate time for installation (upgrade from V7.6.1 to V8.0.0)

The estimate time for products first installation

(1)The estimate time for the installation is the total time of the Backup-time (*1) of every Hitachi Command Suite products that had already been installed which shown in Table 1 or Table 2, and the Import-time of the installing product, and etc. in the tables.

*1: The first upgrade installation takes longer time because backup of every installed Hitachi Command Suite products have to take place.

(2)The estimate time for the products installation after (1)

The estimate time for the installation is the total time of the Import-time of the products shown in Table1 and Table2, and etc. in the tables.

Table1 estimating time for installation (Windows)

units: minutes

#	Product name	Composition	Backup	Import	etc.
1	-Device Manager, -Tiered Storage Manager, - Replication Manager	- Volumes: 128,000 - Paths: 512,000	11	35	49
2	-Tuning Manager	- Hosts: 1,000	14	9	48
3	-Global Link Manager	- Paths/ hosts: 1,000 - Hosts: 60 -	2	7	43

		Pathst atuslo g: 4GB (total capaci ty)			
4	-Compute Systems Manager	- Chassi s: 200 - Blades : 1,000 - Hosts: 1,000	2	2	21
Table2 estimating time for installation (Linux)					
units: minutes					
#	Product name	Comp osition	Backu p	Import	etc.
1	-Device Manager, -Tiered Storage Manager, - Replication Manager	- Volum es: 128,0 00 - Paths: 512,0 00	4	36	35
2	-Tuning Manager	- Hosts: 1,000	3	7	17

Note1: Applies to all supported operating systems

- Tuning Manager agents
None

Removal precautions

- Tuning Manager server
None

- Tuning Manager agents

#	Upgrade Precautions	Applied products	Applied OS
1	<p>The menu item Administrator Console - HTnM is not removed from the Start menu if both of the following conditions are met:</p> <p>(1) The Tuning Manager agent is not installed on the host on which the Tuning Manager server is installed.</p> <p>(2) The version of the last uninstalled Tuning Manager agent is 7.4.1 or earlier.</p> <p>Preventive measures: Uninstall the Tuning Manager agent first.</p> <p>Action to be taken if the problem has occurred: After the Tuning Manager agent has been uninstalled from all hosts, manually remove Administrator Console - HTnM if it remains in the Start menu.</p>	Tuning Manager agents	Windows

Usage precautions

Notes on using in the built-in Administrator account when using Internet Explorer 11.0

#	Usage Precautions	Applied products	Applied OS
1	<p>When you click a button or anchor on the screen to open a new tab or new window, an extra blank window or transitional window might be displayed at the same time. In such a case, please close the unnecessary window.</p> <p>If this problem occurs, create a new Windows user account, and then use the new user account to operate the browser.</p>	Tuning Manager server	Windows

Notes on the use of Performance Reporter when using Internet Explorer 9 or later on Windows Server 2008:

#	Usage Precautions	Applied products	Applied OS
1	<p>If you move the Message dialog box in the browser, an image of the Message dialog box might remain displayed in the pre-move location. If this displayed image remains, close the Message dialog box by clicking the [OK] or [Cancel] button in the Message dialog box.</p>	Tuning Manager server	Windows

Notes on the use of Performance Reporter when using Internet Explorer 11.0:

#	Usage Precautions	Applied products	Applied OS
1	When you select any record in [All Fields] in the [New Report > Field] window of the Report Wizard, the text box for the description may appear with its lower edge cut off. If this happens, adjust the display width of the frame information by adjusting the window size or position dividers.	Tuning Manager server	Windows

Precautions for displaying a list of installed programs

- Tuning Manager server

#	Usage Precautions	Applied products	Applied OS
1	When the Add or Remove Programs dialog box is opened, the displayed icon of this product might switch from an icon displayed initially to the other icon (*1). *1: Any of the icons registered in Windows Even if this symptom occurs, the Tuning Manager server is operational normally.	Tuning Manager server	Windows

- Tuning Manager agents
None

Precautions for monitoring Brocade SAN switches

- Tuning Manager server
None
- Tuning Manager agents

#	Usage Precautions	Applied products	Applied OS
1	If Brocade(R) SMI Agent v120.6.0x (x is "a" or later) or v120.7.1 is used for monitoring a fabric consisting of only Brocade switches whose firmware versions are v5.2.0 or later, a blank might appear for Model Name and Vendor Name for these switches. Brocade has corrected this problem in Brocade SMI Agent v120.7.2. To monitor Brocade switches, use Brocade SMI Agent v120.7.2 or later.	Agent for SAN Switch	Applies to all supported operating systems
2	If Brocade SMI Agent v120.8.0 or v120.9.0 is used for	Agent for SAN	Applies to

	<p>monitoring a fabric including Brocade switches whose firmware versions are v5.2.x, Agent for SAN Switch might fail to collect the data necessary to create a record.</p> <p>Upgrade the firmware version of all switches in the same fabric to v5.3.x or later.</p>	Switch	all supported operating systems
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Notes for trouble on an operation of Agent for SAN Switch

- Tuning Manager server

None

- Tuning Manager agents

#	Usage Precautions	Applied products	Applied OS
1	When Agent for SAN Switch causes a trouble while monitoring CISCO switches, we might ask to gather material for investigation with the packet capture tool etc.	Agent for SAN Switch	Applies to all supported operating systems

Precautions for displaying a correlation reports

- Tuning Manager server

#	Usage Precautions	Applied products	Applied OS
1	Even if a system failover is performed by High Availability Manager functionality for the Universal Storage Platform V/VM series, Virtual Storage Platform, Virtual Storage Platform G1000 or Virtual Storage Platform Gx00 series, the Tuning Manager server continues to display the active volume, not the standby volume, as related to the relevant device file.	Tuning Manager server	Applies to all supported operating systems

- Tuning Manager agents

None

Precautions for monitoring a storage system

- Tuning Manager server

#	Usage Precautions	Applied products	Applied OS
1	If LDEVs are being configured by combining various LDEVs in multiple parity groups in a LUSE configuration,	Tuning Manager server	Applies to all

	<p>the [Write Hit Ratio] of the parity groups might temporarily exceed 100% depending on the level of measurement error used by the storage system. (In such a case, treat the value that exceeds 100% as 100%.)</p> <p>This problem might occur while the Thunder 9200 series, the Thunder 9500V series, or the Hitachi AMS/WMS series is being monitored.</p>		supported operating systems
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- Tuning Manager agents
None

Precautions for monitoring again a Storage System or a Server which had been monitored in the past

- Tuning Manager server

#	Usage Precautions	Applied products	Applied OS																												
1	<p>If users accidentally delete a storage device or host from the list of targets to be monitored by Tuning Manager, or if users accidentally change the storage configuration, the Tuning Manager server might not properly display information even if the status of the storage device or host is restored. Table-1 describes the relationship between the devices monitored by the Tuning Manager server and the information that cannot be properly displayed.</p> <p>Table-1 Devices monitored by the Tuning Manager server and related error</p> <table border="1"> <thead> <tr> <th rowspan="2">Item</th> <th colspan="4">Devices monitored by the Tuning Manager server</th> <th rowspan="2">Error</th> </tr> <tr> <th>Storage</th> <th>Host</th> <th>Virtualization server</th> <th>Oracle</th> </tr> </thead> <tbody> <tr> <td>(a)</td> <td>*</td> <td></td> <td></td> <td></td> <td>Relevant information between storage components is not properly displayed.</td> </tr> <tr> <td>(b)</td> <td>*</td> <td>*</td> <td></td> <td></td> <td>Relevant information between storage devices and hosts is not properly displayed.</td> </tr> <tr> <td>(c)</td> <td>*</td> <td></td> <td>*</td> <td></td> <td>Relevant information between storage devices and virtualization servers is not properly</td> </tr> </tbody> </table>	Item	Devices monitored by the Tuning Manager server				Error	Storage	Host	Virtualization server	Oracle	(a)	*				Relevant information between storage components is not properly displayed.	(b)	*	*			Relevant information between storage devices and hosts is not properly displayed.	(c)	*		*		Relevant information between storage devices and virtualization servers is not properly	Tuning Manager server	Applies to all supported operating systems
Item	Devices monitored by the Tuning Manager server				Error																										
	Storage	Host	Virtualization server	Oracle																											
(a)	*				Relevant information between storage components is not properly displayed.																										
(b)	*	*			Relevant information between storage devices and hosts is not properly displayed.																										
(c)	*		*		Relevant information between storage devices and virtualization servers is not properly																										

					displayed.
(d)		*		*	Relevant information between hosts and Oracle is not properly displayed.

Legend: *: Monitored devices for which the error occurs
Blank: Monitored devices for which the error does not occur

The conditions that cause the error and the recovery procedure are as follows:

1. Conditions

This error might occur if either of the following operations is performed:

(a) Operation 1:

(i) Add the devices indicated by * in Table-1 (b), (c), or (d) to the list of targets to be monitored by the Tuning Manager server. Then, refresh the list of Agents on the Tuning Manager server.

(ii) From the Tuning Manager server, perform automatic or manual polling on the monitoring targets that were added in step (i).

(iii) After polling, delete the storage devices or hosts from the list of targets to be monitored by the Tuning Manager server by using one of the following operations:

[For storage devices]

- Delete Agent for RAID from the list of targets to be monitored by the Tuning Manager server.
- Remove the storage devices from Device Manager.

[For hosts]

- Delete Agent for Server System from the list of targets to be monitored by the Tuning Manager server (if the host is monitored in Agent mode).
- Remove the host from Device Manager (if the host is monitored in agentless mode).

(iv) Refresh the list of Agents on the Tuning Manager server.

(v) Add the monitoring targets that were deleted in step (iii) and whose configurations have not been changed since step (iii) to the list of targets to be monitored by the Tuning Manager server again by using one of the following operations:

[For storage devices]

- Add Agent for RAID to the list of targets to be monitored by the Tuning Manager server.
- Add the storage devices to Device Manager.

[For hosts]

- Add Agent for Server System to the list of targets to be monitored by the Tuning Manager server (if the host is monitored in Agent mode).

	<p>- Add the host to Device Manager (if the host is monitored in agentless mode).</p> <p>(vi) Refresh the list of Agents on the Tuning Manager server.</p> <p>(vii) From the Tuning Manager server, perform automatic or manual polling again on the monitoring targets on which polling was performed in step (ii).</p> <p>(b) Operation 2:</p> <p>(i) Add the devices indicated by * in Table-1 (a), (b), or (c) to the list of targets to be monitored by the Tuning Manager server. Then, refresh the list of Agents on the Tuning Manager server.</p> <p>(ii) From the Tuning Manager server, perform automatic or manual polling on the monitoring targets that were added in step (i).</p> <p>(iii) For the monitored storage devices, one of the following operation is performed:</p> <ul style="list-style-type: none"> - Remove the hardware (port or disk) - Delete the SLPR or CLPR - Change SLPR that belongs to the command device. <p>(iv) From the Tuning Manager server, perform automatic or manual polling again on the monitoring targets on which polling was performed in step (ii).</p> <p>(v) For the monitored storage devices indicated in step (iii), restore them to their status before step (iii).</p> <p>(vi) From the Tuning Manager server, perform automatic or manual polling again on the monitoring targets on which polling was performed in step (ii).</p> <p>Table-2 lists the information that is not properly displayed after Operation 1 or Operation 2 is performed.</p> <p>Table-2 Operations that cause this error and the information that is not properly displayed</p> <table border="1" data-bbox="467 1287 1081 1444"> <thead> <tr> <th>#</th> <th>Operation</th> <th>Information that is not properly displayed</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Operation 1</td> <td>Table-1 (b), (c), and (d)</td> </tr> <tr> <td>2</td> <td>Operation 2</td> <td>Table-1 (a), (b), and (c)</td> </tr> </tbody> </table> <p>2. Recovery procedure</p> <p>Perform one of the procedures below (from 1 to 3) indicated in Table-3 depending on the monitored device on which the error occurred.</p> <p>Table-3 Procedures for recovering from the error</p> <table border="1" data-bbox="467 1682 1081 1845"> <thead> <tr> <th>#</th> <th>Condition</th> <th>Recovery procedure</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>The error occurs on a host that is being monitored in agentless mode.</td> <td>Procedure 1</td> </tr> </tbody> </table>	#	Operation	Information that is not properly displayed	1	Operation 1	Table-1 (b), (c), and (d)	2	Operation 2	Table-1 (a), (b), and (c)	#	Condition	Recovery procedure	1	The error occurs on a host that is being monitored in agentless mode.	Procedure 1		
#	Operation	Information that is not properly displayed																
1	Operation 1	Table-1 (b), (c), and (d)																
2	Operation 2	Table-1 (a), (b), and (c)																
#	Condition	Recovery procedure																
1	The error occurs on a host that is being monitored in agentless mode.	Procedure 1																

2	The error occurs on a virtualization server.	Procedure 2		
3	In cases other than 1 and 2.	Procedure 3		
<p>(a) Procedure 1:</p> <p>(i) Remove from Device Manager the storage device that contains volumes that are connected to the host.</p> <p>(ii) Use Device Manager to refresh the host indicated in step (i).</p> <p>(iii) From the Tuning Manager server, perform manual polling on Device Manager.# 1</p> <p>(iv) Add the storage device that was removed from Device Manager in step (i) to Device Manager again.</p> <p>(v) Use Device Manager to refresh the host indicated in step (i) again.</p> <p>(vi) From the Tuning Manager server, perform manual polling on Device Manager.# 1</p> <p># 1: Be sure to wait at least one hour after the last polling was performed before you perform manual polling.</p> <p>(b) Procedure 2:</p> <p>(i) Delete the storage device that contains volumes being used as a datastore of the virtualization server from the list of targets to be monitored by the Tuning Manager server by using one of the following operations:</p> <ul style="list-style-type: none"> - Delete Agent for RAID from the list of targets to be monitored by the Tuning Manager server. - Remove the storage devices from Device Manager. <p>(ii) From the Tuning Manager server, perform manual polling on the Device Manager that manages the virtualization server indicated in step (i).# 1</p> <p>(iii) Add the storage device that was removed from the list of targets to be monitored by the Tuning Manager server in step (i) to the list of monitoring targets again.</p> <ul style="list-style-type: none"> - Add Agent for RAID to the list of targets to be monitored by the Tuning Manager server. - Add the storage devices to Device Manager. <p>(iv) From the Tuning Manager server, perform manual polling on Device Manager.# 1</p> <p># 1: Be sure to wait at least one hour after the last polling was performed before you perform manual polling.</p> <p>(c) Procedure 3:</p> <p>(i) Delete the monitoring targets whose information is not properly displayed from the list of targets to be monitored by the Tuning Manager server.</p> <p>(ii) Add the monitoring targets that were removed in step (i) to the list of targets to be monitored by the</p>				

	<p>Tuning Manager server again.</p> <p>(iii) From the Tuning Manager server, perform manual polling on the Tuning Manager Agents that monitor the added targets.#1</p> <p>#1: Be sure to wait at least one hour after the last polling was performed before you perform manual polling.</p>		
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- Tuning Manager agents
None

Precautions for displaying a report with the Tuning Manager server

- Tuning Manager server

#	Usage Precautions	Applied products	Applied OS
1	<p>When all of the following conditions are met, the hyperlink for a related host is not displayed on a report displayed by procedures described in the [How to display a report].</p> <p>[Conditions]</p> <p>(1) Connect the Agent for Oracle to the Tuning Manager server.</p> <p>(2) Monitor the host in which the Agent for Oracle has been installed by the Agent for Server System.</p> <p>(3) The hostname mentioned in (2) contains a lower-case letter.</p> <p>[How to display a report]</p> <p>(a) Select the Resources - Applications in the Explorer area.</p> <p>(b) Select the Oracle in the Navigation area.</p> <p>(c) Select the Oracle Instances tab in the Information area (Correlation View).</p> <p>If you want to display a report for the host related to an Oracle instance, select the host from the resource tree.</p>	Tuning Manager server	Applies to all supported operating systems

- Tuning Manager agents
None

Precautions for collecting the record with Agent for Oracle

- Tuning Manager server

None

- Tuning Manager agents

#	Usage Precautions	Applied products	Applied OS
1	<p>When all of the following conditions are met, store the listener.ora file of Oracle Database under the ORACLE_HOME/network/admin directory of Oracle Client 32bit, and restart Agent for Oracle service.</p> <p>(1) Oracle Database 11gR2 or Oracle Database 12cR1 for Solaris, AIX or Linux(x64) is monitored.</p> <p>(2) The listener is monitored with the SQL*Net Listener (PD_PDNL) record or SQL*Net Listeners (PD_PDLS) record.</p> <p>(3) The monitored listener is not a default listener, and the name of listener or port number has been changed.</p>	Agent for Oracle	Linux, AIX, Solaris
2	<p>To monitor Oracle Database on Oracle Linux 7.0, you must apply the OS patch glibc-2.17-55.0.4.el7.i686.rpm. After applying glibc-2.17-55.0.4.el7.i686.rpm, you must install Oracle Client 32-bit.</p> <p>If you do not install Oracle Client 32-bit after applying glibc-2.17-55.0.4.el7.i686.rpm, a segmentation fault might occur when you start sqlplus in Oracle Client 32-bit or Agent for Oracle.</p>	Agent for Oracle	Linux

Precautions for starting or stopping a service automatically on SUSE Linux Enterprise Server 11

- Tuning Manager server and Tuning Manager agents

#	Usage Precautions	Applied products	Applied OS
1	<p>When registering or deleting an automatic start/stop script file for OS by using the chkconfig command on SUSE Linux Enterprise Server 11, a warning message might be output. The following shows an example of a warning message:</p> <pre>insserv: warning: script 'jp1_pc' missing LSB tags and overrides insserv: Default-Start undefined, assuming default start runlevel(s) for script 'jp1_pc'</pre> <p>There is no problem by this warning message, and disregard it.</p> <p>For procedure about starting a service automatically, refer the following section in the manual <i>Hitachi Command Suite Tuning Manager Agent Administration Guide</i>:</p>	Tuning Manager server, Tuning Manager agents	SUSE Linux Enterprise Server 11

	<ul style="list-style-type: none"> - "Managing Collection Manager and Agent services" - "Starting and stopping Collection Manager and Agent services" + "Starting a service automatically" 		
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Precautions for changing a command device name in an AIX environment

- Tuning Manager server

None

- Tuning Manager agents

#	Usage Precautions	Applied products	Applied OS
1	<p>In an environment where AIX v6.1 or AIX v7.1 is installed, if the command device name specified to the "Command Device File Name" item is changed to other than the following format, the performance information cannot be collected from Storage System.</p> <p>Therefore, specify the name according to the following format to the rendev command as the command device name after change.</p> <p>[Format of the command device name] "hdisk" + (Arbitrary half-width alphanumeric characters)</p>	Tuning Manager agents	AIX

Notes applying when Load Reduction for Changing Configuration Mode is enabled in a Hitachi AMS2000 series or Hitachi SMS series storage system

- Tuning Manager server and Tuning Manager agents

#	Usage Precautions	Applied products	Applied OS
1	<p>When the Tuning Manager server is monitoring a Hitachi AMS2000 series or Hitachi SMS series storage system with "Load Reduction for Changing Configuration Mode" enabled, the following problems might occur if the configuration of the system is changed:</p> <p>(1) Collection of performance data fails. (2) Polling fails.</p> <p>To prevent these problems from occurring, before you change the storage system configuration, stop the services of the Tuning Manager server and the Agent for RAID instance that is monitoring the storage system, and restart these services after the configuration has been changed.</p>	Tuning Manager server, Agent for RAID	All ¹

Note1: Applies to all supported operating systems

Precautions for displaying a vendor name of the switch

- Tuning Manager server and Tuning Manager agents

#	Usage Precautions	Applied products	Applied OS
1	<p>When all of the following conditions are met, Unknown might be displayed for the switch's vendor name on the tree.</p> <p>(1) In Agent for SAN Switch, Vendor Name field of PD record for some instance is empty string.</p> <p>(2) The combination of the version of the prerequisite program, such as SMI Agent for FOS/EOS and DCFM, and the firmware version of the switch is not supported.</p> <p>The recovery procedure is as follows:</p> <p>a) Stop the instance of Agent for SAN Switch for which Vendor Name field of PD record includes empty string.</p> <p>b) Confirm the version of the following prerequisite program for the switch which is monitored by the Agent for SAN Switch in a).</p> <ul style="list-style-type: none"> - SMI Agent for FOS/EOS or DCFM (For the Brocade switch only) - firmware version of the switch <p>For details about the supported version of the prerequisite programs for Agent for SAN Switch., see the <i>Hitachi Command Suite System Requirements</i> (MK-92HC209).</p> <p>c) Start the service of Tuning Manager server.</p> <p>d) Execute the following command on the Tuning Manager server host to delete the instance of the Agent for SAN Switch from the monitoring target.</p> <pre>jcctl delete "<service ID of the Agent for SAN Switch instance in a)>"</pre> <p>e) Click Refresh button on the screen of Administration - Data Polling.</p> <p>f) Start the service of Agent for SAN Switch which is stopped in a).</p> <p>g) Click Start Polling button on the screen of Administration - Data Polling.</p> <p>h) Confirm the Navigation area of the Fabrics and make sure that the switch which is monitored by the Agent for SAN Switch of a) is displayed under the vendor name other than Unknown.</p>	Tuning Manager server, Agent for SAN Switch	All ¹

Note1: Applies to all supported operating systems

Precautions when rebooting OS

- Tuning Manager server and Tuning Manager agents

#	Usage Precautions	Applied products	Applied OS
1	<p>When the available IPv6 address has been set in windows system, the symptom such as the following might occur, because the Tuning Manager service has been started abnormally after rebooting the OS.</p> <ul style="list-style-type: none"> - The report might not be displayed by using Performance Reporter. <p>If the above symptom has occurred, perform the following actions after rebooting OS.</p> <ul style="list-style-type: none"> - Stop the Tuning Manager services by executing the hcnds64srv /stop command and the jcstop command. - Restart Tuning Manager services by the hcnds64srv /start command and the jcstart command. <p>If the Tuning Manager services have failed to stop, stop all Tuning Manager services manually whose names are started with "PFM -" from Service Control Manager.</p> <p>To start Service Control Manager, from the Windows Start menu, select Administrative Tools, and then select Services.</p>	Tuning Manager server, Tuning Manager agents	Windows

Precautions for installation folder

- Tuning Manager server and Tuning Manager agents

#	Usage Precautions	Applied products	Applied OS
1	<p>Do not put files or folders other than provided by Tuning Manager under the following folder.</p> <p><Tuning-Manager-installation-folder>\jp1pc\tools</p> <p>If you put files or folders other than provided by Tuning Manager to the above folder, executing of commands or starting of the Tuning Manager services might fail.</p>	Tuning Manager server, Tuning Manager agents	Windows

Notes on InPrivate Browsing of Internet Explorer 9.0

#	Usage Precautions	Applied products	Applied OS
1	<p>During InPrivate Browsing Mode, the browsing history might remain in the browser.</p>	Tuning Manager server	Windows

Notes on enabling SSL(*1) between the Tuning Manager server and management clients when using Firefox

#	Usage Precautions	Applied products	Applied OS
1	To enable SSL between the Tuning Manager server and management clients by using Firefox, perform the following operations: (1) Disable SSL between the Tuning Manager server and management clients. (2) register the license files (3) Enable SSL between the Tuning Manager server and management clients.	Tuning Manager server	Linux

Note1: For details about enabling SSL, see "Security settings for Common Component (communication with the GUI)" in the *Hitachi Command Suite Administrator Guide*.

Notes of using Firefox ESR 17, Firefox ESR 24 or Firefox ESR 31

#	Usage Precautions	Applied products	Applied OS
1	When using Firefox ESR 17, Firefox ESR 24 or Firefox ESR 31 to browse Tuning Manager GUI, the following Flash Player is required. - Flash Player 10.3 to earlier than 11 - Flash Player 11.2	Tuning Manager server	Linux

Notes of the Server Core option of Windows Server 2008 and Windows Server 2012

#	Usage Precautions	Applied products	Applied OS
1	Server Core mode is not supported.	Tuning Manager server, Tuning Manager agents	Windows

Notes of the Minimal Server Interface of Windows Server 2012

#	Usage Precautions	Applied products	Applied OS
1	Minimal Server Interface is not supported.	Tuning Manager server, Tuning Manager agents	Windows

When the Tuning Manager service does not start or stop

#	Usage Precautions	Applied products	Applied OS
1	<p>When the Tuning Manager service starts, the following message may be output to the common message log, syslog(for UNIX) or event log(for Windows), causing a disk space shortage or some other factors.</p> <p>KAVE00201-E An attempt to access the configuration file failed. (file=<file path of jpcns.ini>)</p> <p>In this case, the following symptoms may occur:</p> <p>a) An attempt to stop the service fails outputting the following message to the common message log:</p> <p>KAVE05034-E A service could not stop. (service=service-name, rc=maintenance-code)</p> <p>b) An attempt to start the service fails outputting the following message to the common message log, syslog(for UNIX) or event log(for Windows):</p> <p>KAVE00100-E An error occurred in an OS API(bind). (en=os-detailcode, arg1=argument-1, arg2=argument-2, arg3=argument-3)</p> <p>KAVE00107-E The network environment is invalid. (rc=maintenance-code)</p> <p>KAVE00160-E An attempt to initialize a service failed. (rc=maintenance-code)</p> <p>When these symptoms occur, check whether processes of the Tuning Manager services remain with the Task Manager (for Windows) or the ps command (for UNIX).If these processes remain, kill them and restart the service.</p>	Tuning Manager server, Tuning Manager agents	All

Monitoring Windows hosts

#	Usage Precautions	Applied products	Applied OS
1	<p>CPU information can be collected only for up to 64 CPUs. Therefore, if a host that has 65 or more CPUs is monitored, record instances exceeding 64 cannot be acquired for the PI_PCSR record of Agent for Platform. In addition, the value of the Active CPUs field in the PI record is always 64.</p> <p>Note that, when a host with Windows Server 2012 is monitored, CPU information might not be able to be collected for more than 40 CPUs.</p>	Agent for Server System	Windows

Operating in a Red Hat Enterprise Linux 6.2 or Oracle Linux 6.2 environment

#	Usage Precautions	Applied products	Applied OS
1	<p>In a Red Hat Enterprise Linux 6.2 or Oracle Linux 6.2 environment, the "jpcras<YYMMDD>.tar.Z" file created by the jpcras command may be unable to be extracted.</p> <p>This is because there is a problem in the ncompress package shown below.</p> <ul style="list-style-type: none"> - ncompress-4.2.4-54.el6 <p>Therefore, when you use this product in a Red Hat Enterprise Linux 6.2 or Oracle Linux 6.2 environment, perform either of the following procedures:</p> <p>(1) Do not install the ncompress package. Or when the ncompress package is already installed, remove it.</p> <p>Note: If the ncompress package does not exist, the jpcras command compresses the files by the gzip command.</p> <p>(2) When the following fixed version can be obtained, update it.</p> <ul style="list-style-type: none"> - ncompress-4.2.4-54.el6_2.1 	<p>Tuning Manager server,</p> <p>Agent for RAID ,</p> <p>Agent for Server System,</p> <p>Agent for Switch,</p> <p>Agent for DB2,</p> <p>Agent for Oracle</p>	Linux

Precautions when installing on Windows Server 2012

#	Usage Precautions	Applied products	Applied OS
1	<p>Immediately after performing installation, invalid menu "Performance Management" may be displayed in Apps windows, and Administrator Console may not be started.</p> <p>In this case, sign-in to your host again.</p>	<p>Tuning Manager server,</p> <p>Tuning Manager agents</p>	Windows

Precautions for monitoring the HUS100 series

#	Usage Precautions	Applied products	Applied OS
1	<p>When the monitoring target storage system is the HUS100 series with "packet filtering" function enabled, perform either of the following procedures:</p> <ul style="list-style-type: none"> - Disable "NetBIOS over TCP/IP" on Windows. - When "NetBIOS over TCP/IP" on Windows cannot be disabled, before executing the maintenance-material-acquisition command, stop Agent for RAID and Device Manager. Wait for 5 minutes, and then execute the command. <p>And when executing the netstat command, specify "-n" option.</p>	Agent for RAID	Windows

Note on using Tuning Manager on a Linux server

#	Usage Precautions	Applied products	Applied OS
1	To use Tuning Manager on a Linux server, configure and start X server. - In Main Console of Tuning Manager, the performance chart is not displayed.	Tuning Manager server	Linux

Precautions for collecting the record with Agent for Microsoft Exchange Server

#	Usage Precautions	Applied products	Applied OS
1	To use Agent for Microsoft Exchange Server for monitoring, Mailbox Role for the Microsoft Exchange Server must be installed.	Agent for Microsoft Exchange Server	All ¹

Note1: Applies to all supported operating systems

Precautions for monitoring the HNAS

#	Usage Precautions	Applied products	Applied OS
1	HNAS in a single node configuration used with an internal SMU is not supported by Agent for NAS as a monitoring target.	Agent for NAS	All ¹

Note1: Applies to all supported operating systems

Notes on using Hybrid Store

#	Usage Precautions	Applied products	Applied OS
1	When the amount of memory that is available on the system is less than the memory usage by this software, the installation on Hybrid Store may fails, or the service may not start at after the installation or converting to Hybrid Store. To avoid these cases, install the software on a system that has enough memory. For details about the amount of memory for Agent for RAID, see the <i>Hitachi Command Suite System Requirements</i> (MK-92HC209).	Agent for RAID	Windows, Linux
2	When the amount of physical memory that is available on the system is less than the memory used by this	Agent for RAID	Windows, Linux

	<p>software, A delay to collect performance data might happens or performance data might be dropped because of the processing capacity shortage.</p> <p>To avoid these cases, please try one of the following methods.</p> <ul style="list-style-type: none"> - Set longer collection interval. - Install the software on a system that has enough physical memory. <p>For details about the amount of memory for Agent for RAID, see the <i>Hitachi Command Suite System Requirements</i> (MK-92HC209).</p>		
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Temporary restrictions

For 8.1.3-00

#	Temporary restrictions	Applied products	Applied OS
1	<p>To delete an instance that is operated by using Hybrid Store, execute the htmsrv stop -webservice command to stop the Tuning Manager Agent REST API component before deleting the instance. If you attempt to delete an instance while an Tuning Manager Agent REST API component is running, the deletion of the instance might fail with the KAVE05052-E message.</p>	Agent for RAID	Windows, Linux
2	<p>When you use Hybrid Store as a performance database, it may take a long time (several minutes to several ten minutes. It depends on the number of resources on monitoring systems and the number of Agent instances) to start Tuning Manager Agent REST API components. The following problems occur during the Tuning Manager Agent REST API components startup.</p> <ul style="list-style-type: none"> - When you request the performance data by using Tuning Manager API, the system responds status code 500 (Internal Server Error). - When you execute the htmsrv status command, it displays Tuning Manager - Agent REST Application Service was stopped. - When you execute the htmsrv stop command, it displays Tuning Manager - Agent REST Application Service was stopped, but the service keeps running a certain time period, then the service stops. <p>You can check the state of Tuning Manager - Agent REST Application service by using the OS command (wmic command for Windows, ps command for Linux) and confirm whether the process (cjstartsv) started by the following executable file is running or not.</p> <ul style="list-style-type: none"> - On Windows <Installation Directory> \htnm\HBasePSB\CC\server\bin\cjstartsv.exe - On Linux 	Agent for RAID	Windows, Linux

	/opt/jp1pc/htnm/HBasePSB/CC/server/bin/cjstartsv		
3	<p>When you use Hybrid Store as a Performance database, if one of the following conditions is satisfied and you start Tuning Manager Agent REST API component then stop it within a day and start it again, it takes a long time (several tens of minutes to several hours. It depends on the number of resources on monitoring systems performance data and Collection Interval) to start Tuning Manager Agent REST API Component</p> <ul style="list-style-type: none"> - Agent instances are active for hours while Tuning Manager Agent REST API component is not running. - Agent instances are active for hours while the update of Hybrid Store is not working because of an error <p>In this case, "Temporary restrictions #2" may occur. When "Temporary restrictions #2" occurs, please do not stop Tuning Manager Agent REST API component at least 24 hours.</p>	Agent for RAID	Windows, Linux
4	<p>When you use Hybrid Store as a performance database and change time zone, the following problems will happen:</p> <ul style="list-style-type: none"> - It takes a long time (several tens of minutes to several hours. It depends on the number of resources on monitoring systems) to start Tuning Manager Agent REST API component. - Latest values of performance data that was aggregated are incorrect. 	Agent for RAID	Windows, Linux
5	<p>When using Hybrid Store on Linux, the service fails to start and the message indicating incorrect property value is not output to the log.</p> <p>The following property files are affected:</p> <ul style="list-style-type: none"> - <installation-directory>/htnm/agent/config/dbdataglobalconfig.ini - <installation-directory>/agtx#/store/<instance-name>/dbconfig.ini <p>#: x is replaced with the Agent product ID.</p> <p>If the service fails to start, review the value set for the property, and then start the service again.</p>	Agent for RAID	Linux
6	<p>When you upgrade Agent for RAID in an environment where an agent of a cluster configuration exists, if you select Hybrid Store in upgrading process while the shared disk (that is, the environment directory of the logical host) cannot be connected, the process will be failed. Make sure that the shared disk can be connected when you upgrade the system, and then, refer to the section "Migrating the Store database to the Hybrid Store" of the manual <i>Hitachi Command Suite Tuning Manager Agent Administration Guide</i> to upgrade to Hybrid Store.</p>	Agent for RAID	Windows
7	<p>When you execute the following commands in an environment where an agent of a cluster configuration exists, if the commands are executed while the shared disk (that is, the environment directory of the logical</p>	Agent for RAID	Windows

	<p>host) cannot be connected, the conversion process of the performance database of the agent on a logical host fails with the KATR00124-E message. Make sure that the shared disk can be connected when you perform the following operations:</p> <ul style="list-style-type: none"> - Executing the htmhsmigrate command - Executing the htmhsconvert command by specifying the key option or all option <p>If the above problem occurs, please make sure the shared disk can be connected, and then please try the same operations again.</p>		
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Documentation

Available documents

Document name	Document number	Issue Date
Hitachi Command Suite Tuning Manager Installation Guide	MK-96HC141-27	April 2015
Hitachi Command Suite Tuning Manager Server Administration Guide	MK-92HC021-38	April 2015
Hitachi Command Suite Tuning Manager Agent Administration Guide	MK-92HC013-36	April 2015
Hitachi Command Suite Tuning Manager Application Reports Reference	MK-95HC113-18	February 2015
Hitachi Command Suite Tuning Manager User Guide	MK-92HC022-39	April 2015
Hitachi Command Suite Tuning Manager Hardware Reports Reference	MK-95HC111-25	April 2015
Hitachi Command Suite Tuning Manager Operating System Reports Reference	MK-95HC112-18	April 2015
Hitachi Command Suite Tuning Manager Messages	MK-95HC114-27	April 2015
Hitachi Command Suite Tuning Manager CLI Reference Guide	MK-96HC119-27	April 2015
Hitachi Command Suite Tuning Manager Getting Started Guide	MK-96HC120-23	January 2015
Hitachi Command Suite Tuning Manager API Reference Guide	MK-92HC218-04	April 2015

Documentation errata

For 8.1.3-00

Contents of corrections of the *Hitachi Command Suite Tuning Manager Installation Guide*:

No.	Location to be corrected	Corrections	
1	3. Preparing to install or upgrade agents Fabric configurations that can be monitored	delete	Only Brocade B-Model switches can be set in the unmonitored switch configuration file.
2	3. Setting up the agents Settings for switches that are not monitored	before	Only Brocade B-Model switches can be specified in the unmonitored switch configuration file.
		after	If the connection destination is any of the following, by specifying the unmonitored switches in the unmonitored switch configuration file, you can collect only the information about the switches supported by Agent for SAN Switch. <ul style="list-style-type: none">• Brocade (Network Advisor SMI Agent)• Brocade (DCFM SMI Agent)• Brocade (SMI Agent for FOS)• Cisco (DCNM-SAN SMI-S Agent)

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This product includes software developed by the Java Apache Project for use in
the Apache JServ servlet engine project (<http://java.apache.org/>).

This product includes software developed by the University of California,
Berkeley and its contributors.

This software contains code derived from the RSA Data Security Inc. MD5
Message-Digest Algorithm, including various modifications by Spyglass Inc.,
Carnegie Mellon University, and Bell Communications Research, Inc (Bellcore).

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