

Hitachi Dynamic Link Manager (for VMware®) 8.7.2-00 Release Notes

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About this document

This document (RN-91HC190-32, April 2020) provides late-breaking information about Hitachi Dynamic Link Manager (for VMware) 8.7.2-00. 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 Vantara partners who license and use Hitachi Dynamic Link Manager (for VMware).

Getting help

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Log in and select Product Downloads to access the most current downloads, including important updates that may have been made after the release of the product.

About this release

This is a minor release that adds new features.

Product package contents

Medium	CD-ROM	Revision	Release Type	Prerequisite version of Service Pack
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Software	Hitachi Dynamic Link Manager (for VMware)	8.7.2-00	Full Package	-
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New features and important enhancements

8.7.2-00 Additional Functions and Modifications

- For ESXi 6.7, the number of LUs that are managed by HDLM has been extended to 1,024 LUs, and the number of paths that are managed by HDLM has been extended to 4,096 paths.
- Hitachi Virtual Storage Platform E990 (VSP E990) is now supported

System requirements

Refer to Chapter 3. Creating an HDLM Environment of the Hitachi Command Suite Dynamic Link Manager User Guide for VMware®

Host

For details on supported Hosts refer to the following manual:

- Hitachi Command Suite Dynamic Link Manager User Guide for VMware® Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Hosts and OSs Supported by HDLM

Supported OSs in a HAM environment are listed below:

Supported OS
VMware vSphere ESXi 6.0 Update 2
VMware vSphere ESXi 6.5

Host Bus Adapter (HBA)

Applicable HBAs and HBA drivers:

- Inbox driver for ESXi 6.0/6.5/6.7 or HBA drivers that support ESXi 6.0/6.5/6.7 as listed in VMware Compatibility Guide.
- HBAs and HBA drivers for BladeSymphony that support ESXi 6.0/6.5/6.7 as listed in VMware Compatibility Guide.

Storage

VSP E990 is now supported. For details on supported storage refer to the following manual:

- Hitachi Command Suite Dynamic Link Manager User Guide for VMware® Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Storage Systems Supported by HDLM

When the Dynamic I/O Path Control function is enabled on Hitachi AMS 2000 series, use a microprogram version 08B8/D or later.

Requirements to use a HAM environment are as follows:

- HDLM supports the HAM functionality of the following storage systems:
 - Hitachi Virtual Storage Platform
 - HP P9500
 - Hitachi Unified Storage VM

The required microprogram versions are listed below:

Storage system	Interface	Microprogram version	Remark
Virtual Storage Platform	FC I/F	70-03-XX-XX/XX or later(*1)	X: voluntary number
P9500	FC I/F	70-03-XX-XX/XX or later(*1)	X: voluntary number
Hitachi Unified Storage VM	FC I/F	73-03-0X-XX/XX or later	X: voluntary number

*1: If you use the vStorage APIs for Array Integration with HAM, apply 70-05-00-XX/XX or later.

Operating Systems Requirements

The following operating systems are supported.

- VMware vSphere ESXi 6.0 Standard Edition/ Enterprise Edition/ Enterprise Plus Edition
- VMware vSphere ESXi 6.0 Update 1 Standard Edition/ Enterprise Edition/ Enterprise Plus Edition
- VMware vSphere ESXi 6.0 Update 2 Standard Edition/ Enterprise Edition/ Enterprise Plus Edition
- VMware vSphere ESXi 6.0 Update 3 Standard Edition/ Enterprise Edition/ Enterprise Plus Edition
- VMware vSphere ESXi 6.5 Standard Edition/ Enterprise Edition/ Enterprise Plus Edition
- VMware vSphere ESXi 6.5 Update 1 Standard Edition/ Enterprise Edition/ Enterprise Plus Edition
- VMware vSphere ESXi 6.5 Update 2 Standard Edition/ Enterprise Edition/ Enterprise Plus Edition
- VMware vSphere ESXi 6.5 Update 3 Standard Edition/ Enterprise Edition/ Enterprise Plus Edition
- VMware vSphere ESXi 6.7 Standard Edition/ Enterprise Edition/ Enterprise Plus Edition
- VMware vSphere ESXi 6.7 Update 1 Standard Edition/ Enterprise Edition/ Enterprise Plus Edition
- VMware vSphere ESXi 6.7 Update 2 Standard Edition/ Enterprise Edition/ Enterprise Plus Edition
- VMware vSphere ESXi 6.7 Update 3 Standard Edition/ Enterprise Edition/ Enterprise Plus Edition

Prerequisite Programs

- Host
- None
- Remote management host

VMware vSphere CLI 6.0/6.5/6.7 must be installed and set up to be connected to the host.

Resolved problems

None

Known problems

(1) When you remove HDLM by using `removehdlm` (utility for Removing HDLM) in "HDLM-installation-folder\bin", perform the following operations.

- "HDLM-installation-folder\bin" is not deleted. Delete "HDLM-installation-folder".
- The dialog box "removehdlm is in use" is displayed during a remove. Select "Continue" to continue the remove.

The above phenomena can be avoided by performing either of the following procedures.

- Obtain the HDLM installation DVD, and then remove HDLM by using `removehdlm` utility stored in "drive-containing-installation-DVD-ROM:\HDLM_VMware\DLMTools".
- Copy `removehdlm` utility in "HDLM-installation-folder\bin" to any location, and then remove HDLM by using the copied `removehdlm` utility.

(2) When you change the setting of user account or Credential Store file by `dlmrmcenv` (utility for Configuring HDLM Remote Management Client Environments), restart the following two services by using the Windows service console to enable the change.

- DLManagerVM
- HBsA Service

(3) A dialog box is displayed to prompt a system reboot even when a new installation or upgrade installation is aborted. Select "No" since the reboot associated with the installation abort is not required.

(4) When you create a cluster configuration in a virtual machine environment by using cluster software (such as MSCS or HA Monitors) that uses SCSI reservations, you cannot apply the following HDLM load balancing algorithms:

- Extended Round Robin: HTI_PSP_HDLM_EXRR

- Extended Least I/Os: HTI_PSP_HDLM_EXLIO
- Extended Least Blocks: HTI_PSP_HDLM_EXLBK

When you create a cluster configuration in a virtual machine environment by using cluster software that uses SCSI reservations, specify one of the following load balancing algorithms for the LUs assigned to the virtual machine:

- Most Recently Used (VMware): VMW_PSP_MRU
- Round Robin (VMware): VMW_PSP_RR(*1)

Note that you can specify settings for each LU by using VMware (by means such as the `esxcli` commands or vSphere Web Client) or by using Global Link Manager.

(*1): You can specify this algorithm when you are using ESXi6.0 Update3 or later.

Installation precautions

For details on HDLM installation refer to the following document:

- Hitachi Command Suite Dynamic Link Manager User Guide for VMware®

Chapter 3. Creating an HDLM Environment - Installing HDLM

Additional Precautions

(1) ESXi and VIB package that is a module package of VMware respectively have four acceptance levels: `VmwareCertified`, `VmwareAccepted`, `PartnerSupported` and `CommunitySupported`, from higher levels. If the acceptance level of an ESXi is higher than that of a VIB package, the VIB package cannot be installed on the ESXi. In this case, an operation of lowering the acceptance level of the ESXi to an appropriate level is required. For the operation procedures, refer to the following document:

- Hitachi Command Suite Dynamic Link Manager User Guide for VMware®

Chapter 3. Creating an HDLM Environment - Installing HDLM

(2) Names of offline bundle files and plugin modules provided in this version are listed below.

- Offline bundle name and information of plugins

Offline bundle name	Displaying the HDLM version of the host	Plugin name	Version *1	Acceptance level
hdlm-0872000001-0600.zip	8.7.2-00	satp-hdlm	08.7.2-00.0600	VMwareAccepted
		psp-hdlm-exlio	08.7.2-00.0600	VMwareAccepted
		psp-hdlm-exlbk	08.7.2-00.0600	VMwareAccepted
		psp-hdlm-exrr	08.7.2-00.0600	VMwareAccepted
		hex-hdlm-dlnkmgr	08.6.2-00	PartnerSupported

*1: You can check the version information of each plug-in installed on an ESXi host by running the following command from a remote management client:

- esxcli host-connection-option software vib list | findstr hdlm

(3) Before installing HDLM, make sure that VMware vSphere CLI (vCLI) is installed and the ESXi server can be accessed by vCLI.

(4) If HDLM is managed with HGLM, confirm the following before the operation of "Hitachi Command Suite Dynamic Link Manager User Guide for VMware® - Settings When Managing HDLM by Using Global Link Manager".

- On Remote Management Client, a host name of an ESXi host can be resolved into an IP address.

- A Credential Store file is created by using the resolved IP address.

(5) The command prompt which is displayed during an installation, upgrade, or uninstallation of remote management client is automatically closed after the operation is completed. Make sure not to close it during the operation. If Command Prompt is closed during the operation, the operation of an installation, upgrade, or uninstallation ends before completion. In this case, perform an upgrade installation.

(6) The maximum number of LUs including all SCSI devices such as built-in disks and CD-ROM drives is 256 for ESXi 6.0, 512 for ESXi 6.5 and 1024 for ESXi 6.7 or later. Therefore, the maximum number of LUs for a storage system manageable by HDLM will be smaller than the maximum for ESXi, depending on the status of other connected devices. Before applying HDLM to an ESXi host, confirm that the ESXi host correctly recognizes the LUs to be managed by HDLM.

Remove Precautions

For details on HDLM installation refer to the following document:

- Hitachi Command Suite Dynamic Link Manager User Guide for VMware®

Chapter 3. Creating an HDLM Environment - Removing HDLM

Usage precautions

Notes on General procedures

(1) HDLM provides NMP sub-plugins(SATP/PSP) to enable multipath management for Hitachi storages. For the information of NMP/SATP/PSP, refer to the following documentation(*).

<https://docs.vmware.com/en/VMware-vSphere/6.7/vsphere-esxi-vcenter-server-67-storage-guide.pdf>

(*): It is the information as of September, 2018.

(2) Any restrictions and precautions for NMP which VMware announces are applied to your environment using HDLM. Check the restrictions and precautions before you build an environment.

(3) Any restrictions and precautions for PSP VMW_PSP_RR (Round Robin) that is provided by VMware are applied to the following HDLM load balances.

- HTI_PSP_HDLM_EXLIO

- HTI_PSP_HDLM_EXLBK

- HTI_PSP_HDLM_EXRR

(4) In HDLM 8.6.0 and later, the specifications were changed to match those of VMW_PSP_RR (a PSP of VMware NMP) so that "Active(I/O)" is displayed as the status for all active paths in vSphere Client and in vSphere Web Client.

If you want to revert to the previous specification, in which "Active(I/O)" is displayed only for the last-used path, execute the following commands, and then restart the host:

- esxcli host-connection-option system module parameters set -m=hti_psp_hdlm_exlio -p reportWorkingPaths=1
- esxcli host-connection-option system module parameters set -m=hti_psp_hdlm_exlbc -p reportWorkingPaths=1
- esxcli host-connection-option system module parameters set -m=hti_psp_hdlm_exrr -p reportWorkingPaths=1

This setting is enabled as long as a new installation of ESXi is not performed.

Note that if you specify 2 for reportWorkingPaths in the preceding commands, "Active(I/O)" is displayed as the path status for all active paths. You can check the setting values for reportWorkingPaths by using the following commands:

- esxcli host-connection-option system module parameters list -m=hti_psp_hdlm_exlio
- esxcli host-connection-option system module parameters list -m=hti_psp_hdlm_exlbc
- esxcli host-connection-option system module parameters list -m=hti_psp_hdlm_exrr

Values that can be specified for reportWorkingPaths:

- Null character or 2: Display "Active(I/O)" for all active paths.
- 1: Display "Active(I/O)" for the last-used path.

(Note that if you change this setting, the new setting value becomes valid after the host is restarted.)

Notes on HAM procedures

(1) In the case of displaying the LU information, the HAM information is not output by specifying the "all" parameter-value for the HDLM command. Specify the "ha" and "hastat" parameter-value instead.

(2) An online operation is performed on an owner path, a non-owner path's status may change to Offline(E). After performing an online operation on an owner path, use the HDLM command to make sure that the non-owner path's status is Online. If the non-owner path's status is Offline(E), change the status of HAM pairs to PAIR, and then perform an online operation on the Offline(E) path again.

(3) When you set up a HAM pair to be managed by HDLM, make sure that the host recognizes paths to the MCU (Primary VOL) and RCU (Secondary VOL) after the HAM pair is created(*).

Execute the `dlnkmgr view -lu -item hastat` operation. If `ha` is not displayed in the `HaStat` column, then the corresponding LU is not recognized as being in a HAM configuration.

If the host recognizes the paths to the MCU and RCU or either one of the paths, before the HAM pair is created, restart the host after the HAM pair is created.

(4) If you release a HAM pair to recover the system after a HAM volume failure, do not restart a host that is connected to the MCU and RCU while the HAM pair is released.

If you need to restart the host while the HAM pair is released, disconnect all paths to the MCU and RCU, restart the host, re-create the HAM pair, and then reconnect the paths.

If you restart a host that is connected to the MCU and RCU while the HAM pair is released, the RCU volume will be recognized as a volume other than an MCU volume. If this occurs, restart the host after the HAM pair is re-created.

Execute the `dlnkmgr view -lu -item hastat` operation, and then confirm that `ha` is displayed in the `HaStat` column.

Notes on VSP E990 Support

- 1) The notes on using VSP Fx00 models also apply to VSP E990.
- 2) "VSP_Ex00" is displayed for the model ID of VSP E990.
- 3) For example, if you run the HDLM command `dlnkmgr view -path`, the product ID is displayed as follows:

Without the -sname parameter	With the -sname parameter (Displays the following for the model ID)
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Emulation Type	VSP_Ex00
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Documentation

Available documents

Document name	Document number	Issue date
Hitachi Command Suite Dynamic Link Manager (for VMware®) User Guide	MK-92DLM130-23	March 2020

Documentation errata

Section requiring update	Update
<p>Creating an HDLM environment</p> <p>HDLM system requirements</p> <p>Storage systems supported by HDLM</p> <p>Storage systems</p>	<p>HDLM supports the following storage systems:</p> <p>If an FC-SAN is used:</p> <ul style="list-style-type: none"> - Hitachi AMS2000 series - Hitachi SMS series <ul style="list-style-type: none"> - Hitachi Universal Storage Platform V - Hitachi Universal Storage Platform VM - Hitachi Virtual Storage Platform - Hitachi Virtual Storage Platform 5100 - Hitachi Virtual Storage Platform 5500 - Hitachi Virtual Storage Platform 5100H

	<ul style="list-style-type: none"> - Hitachi Virtual Storage Platform 5500H - Hitachi Virtual Storage Platform G1000 - Hitachi Virtual Storage Platform G1500 - Hitachi Virtual Storage Platform F1500 - Hitachi Virtual Storage Platform E990 (new) - Hitachi Virtual Storage Platform G200 - Hitachi Virtual Storage Platform G350 - Hitachi Virtual Storage Platform G370 - Hitachi Virtual Storage Platform G400 - Hitachi Virtual Storage Platform G600 - Hitachi Virtual Storage Platform G700 - Hitachi Virtual Storage Platform G800 - Hitachi Virtual Storage Platform G900 - Hitachi Virtual Storage Platform F350 - Hitachi Virtual Storage Platform F370 - Hitachi Virtual Storage Platform F400 - Hitachi Virtual Storage Platform F600 - Hitachi Virtual Storage Platform F700 - Hitachi Virtual Storage Platform F800 - Hitachi Virtual Storage Platform F900 - Hitachi Virtual Storage Platform N400
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	<ul style="list-style-type: none"> - Hitachi Virtual Storage Platform N600 - Hitachi Virtual Storage Platform N800 - HUS100 series - HUS VM - HPE StorageWorks P9500 Disk Array - HPE XP8 Storage - HPE XP7 Storage - XP20000/XP24000 <p>If an IP-SAN is used:</p> <ul style="list-style-type: none"> - Hitachi AMS2000 series - Hitachi SMS series 									
<p>Command reference view (displays information) Items of path information</p> <p>Table 6-10 Path information</p>	<table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left; width: 30%;">No summary displayed</th> <th style="text-align: left; width: 30%;">summary displayed</th> <th style="text-align: left; width: 40%;">Description</th> </tr> </thead> <tbody> <tr> <td>iLU#1</td> <td>iLU</td> <td>LU number in the storage system.</td> </tr> <tr> <td></td> <td></td> <td> <p>This number combined with the storage system name (shown in DskName) identifies the LU that is accessed by a path.</p> <p>- For the HUS VM, indicated by a hexadecimal number.</p> <p>The first two characters of iLU are the CU number, and the last two</p> </td> </tr> </tbody> </table>	No summary displayed	summary displayed	Description	iLU#1	iLU	LU number in the storage system.			<p>This number combined with the storage system name (shown in DskName) identifies the LU that is accessed by a path.</p> <p>- For the HUS VM, indicated by a hexadecimal number.</p> <p>The first two characters of iLU are the CU number, and the last two</p>
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	<p>characters are the internal LU number within the CU.</p> <ul style="list-style-type: none">- For P9500, XP8, and XP7, indicated by a hexadecimal number. The first two characters of iLU are 00, the middle two numbers are the CU number, and the last two characters are the internal LU number within the CU.- For Hitachi AMS2000 series, Hitachi SMS series and HUS100 series, indicated by a decimal number. The entire value of iLU is the internal LU number within the storage system. You can identify an actual LU by referencing iLU from the storage system management program.- For Universal Storage Platform V/VM series, Hitachi Virtual Storage Platform, VSP 5000 series, VSP G1000, G1500, VSP F1500, VSP E990, VSP Gx00 models, VSP Fx00 models, and VSP N series indicated by a
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	<p>hexadecimal number. The first two characters of iLU are the number of the logical DKC (Disk Controller), the middle two numbers are the CU number, and the last two characters are the internal LU number within the CU.</p>
<p>Command reference view (displays information)</p> <p>Items of path information</p> <p>Table 6-12 Product ID displayed by the view -path operation</p>	<p>Model names of storage systems</p> <p>Hitachi AMS2000 series product identifier#1 AMS</p> <p>Hitachi SMS series SMS</p> <p>HUS100 series HUS100</p> <p>-Hitachi Universal</p> <p>Storage Platform V Emulation type#1 USP_V</p> <p>- Hitachi Universal</p> <p>Storage Platform VM</p> <p>Hitachi Virtual Storage VSP Platform</p> <p>VSP 5000 series VSP_5000</p> <p>VSP G1000 VSP_G1000</p> <p>VSP G1500 VSP_G1500</p> <p>VSP F1500 VSP_F1500</p> <p>Virtual storage system "VSP</p>

	<p>VSP_G1000</p> <p>G1000, G1500 and VSP</p> <p>F1500"#2</p> <p>VSP E series</p> <p>VSP_E x00</p> <p>VSP Gx00 models</p> <p>VSP_Gx00</p> <p>VSP Fx00 models</p> <p>VSP_Fx00</p> <p>VSP N series#3</p> <p>VSP_Gx00</p> <p>SP_Fx00</p> <p>HUS VM</p> <p>HUS_VM</p> <p>P9500</p> <p>P9500</p> <p>XP8</p> <p>XP8</p> <p>XP7 XP7</p> <p>XP20000</p> <p>XP20000</p> <p>XP24000</p> <p>XP24000</p>									
<p>Command reference view (displays information)</p> <p>To display LU information</p> <p>Items of LU information</p> <p>Table 6-14 LU information</p>	<table border="0"> <tr> <td data-bbox="578 1306 896 1348">No summary</td> <td data-bbox="896 1306 1042 1348">summary</td> <td data-bbox="1042 1306 1174 1348">Description</td> </tr> <tr> <td data-bbox="578 1348 896 1432">iLU</td> <td data-bbox="896 1348 1042 1432"></td> <td data-bbox="1042 1348 1174 1432">LU number in the storage system.</td> </tr> <tr> <td data-bbox="578 1432 896 1852"></td> <td data-bbox="896 1432 1042 1852"></td> <td data-bbox="1042 1432 1174 1852">This number combined with the storage system name (shown in DskName) identifies the LU that is accessed by</td> </tr> </table>	No summary	summary	Description	iLU		LU number in the storage system.			This number combined with the storage system name (shown in DskName) identifies the LU that is accessed by
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	<p>VSP G1000, G1500, VSP F1500, VSP E990, VSP Gx00 models, VSP Fx00 models, and VSP N series indicated by a hexadecimal number. The first two characters of iLU are the number of the logical DKC (Disk Controller), the middle two numbers are the CU number, and the last two characters are the internal LU number within the CU.</p>
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