

Hitachi Dynamic Link Manager (for Windows®) 8.8.3-02 Release Notes

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About this document

This document (RN-00HS272-62, June 2022) provides late-breaking information about Dynamic Link Manager (for Windows®) 8.8.3-02. 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 Windows®).

Getting help

Hitachi Vantara Support Connect is the destination for technical support of products and solutions sold by Hitachi Vantara. To contact technical support, log on to Hitachi Vantara Support Connect for contact information:

https://support.hitachivantara.com/en_us/contact-us.html.

Hitachi Vantara Community is a global online community for customers, partners, independent software vendors, employees, and prospects. It is the destination to get answers, discover insights, and make connections. **Join the conversation today!** Go to community.hitachivantara.com, register, and complete your profile.

Accessing product downloads

Product software, drivers, and firmware downloads are available on Hitachi Vantara Support Connect: <https://support.hitachivantara.com/>.

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

Product package contents

Medium	CD-ROM	Revision	Release Type	Prerequisite version of Service Pack
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Software	Hitachi Dynamic Link Manager (for Windows®)	8.8.3-02	Full Package	-
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New features and important enhancements

[8.8.3-02 Additional Functions and Modifications]

None.

[8.8.3-00 Additional Functions and Modifications]

- 1) Windows Server 2022 is supported.
- 2) The version of JDK that bundled with HDLM has been changed to 11.0.
- 3) The log utility that bundled with HDLM been changed from Log4j1 1.2.3 to Log4j2 2.17.1.
- 4) The javapath_setup command is no longer supported. Due to this, Oracle JRE is also no longer supported.
- 5) Microsoft Edge is supported.

System requirements

Refer to Chapter 3. Creating an HDLM environment of the Hitachi Dynamic Link Manager (for Windows®) User Guide.

Host

For details on supported Hosts, refer to the following manual:

- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 3. Creating an HDLM environment - HDLM system requirements - OSs supported by HDLM

Host Bus Adapter (HBA)

For information on supported HBAs and drivers, refer to Appendix A - Host Bus Adapter (HBA) Support Matrix.

Storage

For details on supported storage systems, refer to the following manual:

- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 3. Creating an HDLM environment - HDLM system requirements - Storage systems supported by HDLM

Operating Systems Requirements

For details on supported operating systems, refer to the following manual:

- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 3. Creating an HDLM environment - HDLM system requirements - OSs supported by HDLM

Prerequisite Programs

None.

Related Programs

For details on related programs, refer to the following manual:

- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 3. Creating an HDLM environment - HDLM system requirements - Cluster software supported by HDLM

Supported Oracle RAC version:

OS	Version	DB File
Windows 2012 (x64) noSP	11.2.0.4.0 (*1)	ASM
	12.1.0.2 (*1)	ASM
Windows 2012 (x64) R2 noSP	11.2.0.4.0 (*1)	ASM
	12.1.0.2 (*1)	ASM
Windows 2016 (x64)	12.2.0.1 (*1)	ASM
	18.3.0.0 (*1)	ASM
	19.3.0.0 (*1)	ASM
Windows 2019 (x64)	19.3.0.0 (*1)	ASM
	19.10.0.0 (*1)	ASM

*1: It is recommended that you use external redundancy for ASM disk groups. To use normal or high redundancy, contact the Oracle Corporation.

Memory and Disk Space Requirements

For details on memory and disk space requirements, refer to the following manual:

- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 3. Creating an HDLM environment - HDLM system requirements - Memory and disk capacity requirements

HDLM Supported Configurations

For details on the condition that HDLM can manage space requirements, refer to the following manual:

- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 3. Creating an HDLM environment - HDLM system requirements - Number of LUs and paths that are supported in HDLM

Resolved problems

[8.8.3-02 Modifications]

- 1) The following vulnerabilities related to the Java that comes with HDLM. CVE-2022-21248, CVE-2022-21271, CVE-2022-21277, CVE-2022-21282, CVE-2022-21283, CVE-2022-21291, CVE-2022-21293, CVE-2022-21294, CVE-2022-21296, CVE-2022-21305, CVE-2022-21340, CVE-2022-21341, CVE-2022-21360, CVE-2022-21365, CVE-2022-21366

[8.8.3-00 Modifications]

- 1) The following vulnerabilities related to the JRE that comes with HDLM. CVE-2021-2341, CVE-2021-2369, CVE-2021-2388, CVE-2021-35567, CVE-2021-35550, CVE-2021-35586, CVE-2021-35564, CVE-2021-35556, CVE-2021-35559, CVE-2021-35561, CVE-2021-35565, CVE-2021-35578, CVE-2021-35603, CVE-2021-35588

Known problems

- 1) In VSP 5100, 5100H, 5200, 5200H, 5500, 5500H, 5600, 5600H VSP E590, E590H, E790, E790H, E990, E1090, E1090H, VSP G200, G350, G370, G400, G600, G700, G800, G900, G1000, G1500, VSP F350, F370, F400, F600, F700, F800, F900, F1500, VSP N400, N600, N800, XP7, XP8, and Hitachi Unified Storage VM, LUN 0 to 2047 can be assigned, but the support range for HDLM is from 0 to 255. Therefore, HDLM cannot recognize LUs of 256 to 2047.
- 2) The Emulex FC Port Driver cannot be used.
- 3) In Windows 2012, Windows 2016, Windows 2019 and Windows 2022 environment, the output function of performance information using Windows performance monitor console is not supported.
- 4) HDLM does not support the Microsoft Cluster Service and Microsoft Failover Cluster in an environment where Veritas Storage Foundation 5.1 for Windows is used.
- 5) When executing the DLMgetras (utility for collecting error information), specify an output directory which contains only alphanumeric characters. If it contains characters other than an alphanumeric character, the collected information may be outputted to a wrong directory. And when changing the output directory of DLMgetras utility executed from the Windows Start menu, do not enclose the output directory name in double quotation marks ("").
- 6) Storage systems which have following functions are no longer supported.
 - Dynamic load balance control function
 - High Availability Manager function
 - Virtual ID function for storage migration

But the parameters for these functions are displayed in the format of set or view operation of the HDLM command when help operation is executed. And the following item is displayed when view -sys operation is executed:

Dynamic I/O Path Control

Closing known problems

[8.8.3-02 Modifications]

None.

[8.8.3-00 Modifications]

- When the refresh operation of the HDLM command is performed, instead of "ConfigurationAccess", "Authentication" is set in the audit event category for the KAPL15121-I or KAPL15122-W message, which is output to the audit log.

Installation precautions

For details on HDLM installation, refer to the following manual:

- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 3. Creating an HDLM environment - Notes on creating an HDLM environment
- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 3. Creating an HDLM environment - Installing HDLM

Additional Precautions

When you remove HDLM 5.8.0 to 5.9.1, use the user account used to install HDLM. If HiCommand Device Manager (HDvM) Agent 5.0.0 to 5.8.0 was installed before HDLM 5.8.0 to 5.9.1 was installed, remove.

Updating installation of HDLM precautions

For details on updating HDLM, refer to the following manual:

- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 3. Creating an HDLM environment - Notes on creating an HDLM environment
- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 3. Creating an HDLM environment - Installing HDLM

Remove precautions

For details on HDLM remove, refer to the following manual:

- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 3. Creating an HDLM environment - Removing HDLM

Usage precautions

Notes on compatibility between versions of HDLM

For details on compatibility between versions of HDLM, refer to the following manual:

- Hitachi Dynamic Link Manager (for Windows®) User Guide Appendixes A Functional differences between versions of HDLM

Notes on Environment Settings

For details on usage precautions when setting HDLM environment, refer to the following manual:

- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 3. Creating an HDLM Environment - HDLM system requirements - Number of LUs and paths that are supported in HDLM
- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 3. Creating an HDLM environment - Notes on creating an HDLM environment
- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 3. Creating an HDLM environment - Setting up HDLM

Notes on General procedures

For details on usage precautions when using HDLM, refer to the following manual:

- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 2. HDLM functions - Performing failovers and failbacks using path switching - Path status transition - Status transitions of a path
- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 2. HDLM functions - Monitoring intermittent errors(functionality when automatic failback is used) - Intermittent error monitoring actions
- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 3. Creating an HDLM environment - Removing HDLM - Clearing the persistent reservation
- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 4. HDLM operation - Notes on using HDLM
- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 4. HDLM operation - HDLM operations using the HDLM GUI - Notes on using the HDLM GUI
- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 4. HDLM operation - Using commands for HDLM operations - Notes on using commands
- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 4. HDLM operation - Reconfiguring the HDLM operating environment
- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 5. Troubleshooting - Checking error information in messages
- Hitachi Dynamic Link Manager (for Windows®) User Guide Chapter 6. Command reference - view (displays information)
- Hitachi Dynamic Link Manager GUI Help Section 3.1 HDLM operations using the HDLM GUI
- Hitachi Dynamic Link Manager GUI Help Section 5.2 Path Management window

Additional Usage Precautions

- Version numbers are displayed as follows after this version of HDLM is installed.

Function	Item	Version number
HDLM command (dlnkmgr)	HDLM Version	8.8.3-02
	Service Pack Version	Blank
	HDLM Manager	8.8.3-00
	HDLM Alert Driver	8.8.3-00
	HDLM Driver	8.8.3-00
HDLM GUI	HDLM version	8.8.3-02
Registry(*1)	TechnicalVersion	8.8.3-02

*1:Version numbers are stored in the following registry key.

[Key]

- When using Windows 2012, Windows 2016, Windows 2019, or Windows 2022

HKEY_LOCAL_MACHINE\SOFTWARE\HITACHI\DynamicLinkManager

Notes on Using the HDLM GUI

- If you manage HDLM by using HGLM, do not set the HDLM operating environment in the Options windows. If you set the operating environment in the Option windows, the load balancing algorithm and the path use times for individual LUs, which were set by using HGLM, will become invalid, and the system value displayed in the Option windows will be applied to the settings for the individual LUs.

Documentation

<https://knowledge.hitachivantara.com/Documents>

Available documents

Document name	Document number	Issue date
Hitachi Dynamic Link Manager (for Windows®) User Guide	MK-92DLM129-54	February 2022

Documentation errata

none.

Appendix A

Host Bus Adapter (HBA) Support Matrix

Use the iSCSI I/F adapter or Fibre Channel I/F adapters listed as follows. If plural adapters are to be used, all of them must be same type. If it is using mixed types of HBA, that might cause a path switch problem.

- 1) For Hitachi storage system (Windows 2012 with no service Pack)

OS	HBA		Driver
Windows 2012 (x64)	Fibre Channel	Emulex	Bundle
			STOR Miniport 2.72.012.001
			STOR Miniport 2.72.205.004
			STOR Miniport 2.74.009.001
			STOR Miniport 2.74.014.001
			STOR Miniport 2.74.016.001
			STOR Miniport 2.76.003.001
			STOR Miniport 10.0.720.0
			STOR Miniport 10.2.261.4
			STOR Miniport 10.2.370.8

			STOR Miniport 10.4.246.0
			STOR Miniport 10.6.114.0
			STOR Miniport 10.7.110.20
			STOR Miniport 11.0.247.0
			STOR Miniport 11.1.145.16
			STOR Miniport 11.2.139.0
			STOR Miniport 11.4.142.11
			STOR Miniport 11.4.204.8
			STOR Miniport 12.0.193.13
			STOR Miniport 12.0.257.9
			STOR Miniport 12.0.367.0
			STOR Miniport 12.2.207.0
			STOR Miniport 12.2.284.0
			STOR Miniport 12.4.243.4
			STOR Miniport 12.6.165.0
			STOR Miniport 12.8.334.6
		QLogic	Bundle
			STOR Miniport 3.2.5.0
			STOR Miniport 9.1.9.205
			STOR Miniport 9.1.10.26
			STOR Miniport 9.1.10.27
			STOR Miniport 9.1.11.20
			STOR Miniport 9.1.11.24
			STOR Miniport 9.1.11.26

			STOR Miniport 9.1.11.28
			STOR Miniport 9.1.12.21
			STOR Miniport 9.1.13.20
			STOR Miniport 9.1.15.20
			STOR Miniport 9.1.15.21
			STOR Miniport 9.1.17.21
			STOR Miniport 9.1.17.22
			STOR Miniport 9.1.17.25
			STOR Miniport 9.1.18.20
			STOR Miniport 9.2.1.20
			STOR Miniport 9.2.2.20
			STOR Miniport 9.2.3.20
			STOR Miniport 9.2.4.21
			STOR Miniport 9.2.4.21
			STOR Miniport 9.2.6.22
			STOR Miniport 9.2.8.20
			STOR Miniport 9.2.9.20
			STOR Miniport 9.2.9.23
			STOR Miniport 9.2.9.23
			STOR Miniport 9.4.1.20 (*2)
		Hitachi Compute Blade	Bundle (*1)
		HPE	STOR Miniport 2.74.009.001
			STOR Miniport 9.1.10.27
			STOR Miniport 9.1.11.20

			STOR Miniport 9.1.11.24	
			STOR Miniport 9.1.15.21	
			STOR Miniport 9.1.17.21	
			STOR Miniport 9.1.17.22	
			STOR Miniport 9.1.17.25	
			STOR Miniport 9.2.4.21	
			STOR Miniport 10.7.110.20	
			STOR Miniport 11.1.145.16	
		Brocade	Bundle	
			STOR Miniport 3.0.2.21	
			STOR Miniport 3.1.0.1	
			STOR Miniport 3.2.4.0	
		iSCSI	Microsoft	Bundle
				Emulex
	STOR Miniport 10.0.732.0			
	STOR Miniport 10.2.370.9			
	STOR Miniport 10.2.421.0			
	STOR Miniport 10.4.245.0			
	STOR Miniport 10.6.116.0			
	STOR Miniport 11.0.271.0			
STOR Miniport 11.1.185.0				
STOR Miniport 11.2.1153.23				
STOR Miniport 11.4.1174.0				

		QLogic	STOR Miniport 2.1.6.10
	Fibre Channel over Ethernet	Emulex	Bundle
			STOR Miniport 2.72.012.001
			STOR Miniport 2.72.205.004
			STOR Miniport 2.74.014.001
			STOR Miniport 2.76.003.001
			STOR Miniport 10.0.720.0
			STOR Miniport 10.2.261.4
			STOR Miniport 10.2.370.8
			STOR Miniport 10.4.246.0
			STOR Miniport 10.6.114.0
			STOR Miniport 10.7.110.20
			STOR Miniport 11.0.247.0
			STOR Miniport 11.1.145.16
		STOR Miniport 11.2.1135.0	
		STOR Miniport 11.4.1162.0	
		QLogic	STOR Miniport 3.2.5.0
			STOR Miniport 9.1.10.15
			STOR Miniport 9.1.11.16
			STOR Miniport 9.1.12.10
			STOR Miniport 9.1.13.10
	HPE	STOR Miniport 2.74.014.001	
		STOR Miniport 2.76.003.001	
		STOR Miniport 7.13.4.0	

			STOR Miniport 7.14.0.0 or later
			STOR Miniport 10.2.261.4
			STOR Miniport 10.4.246.0
			STOR Miniport 10.7.110.20
			STOR Miniport 11.1.145.16
		Brocade	STOR Miniport 3.2.4.0
			STOR Miniport 3.2.5.0
		Cisco	STOR Miniport 2.3.0.12
			STOR Miniport 2.4.0.11
			STOR Miniport 2.4.0.19

2) For Hitachi storage system (Windows 2012 R2 with no service Pack)

OS	HBA		Driver
Windows 2012 R2 (x64)	Fibre Channel	Emulex	Bundle
			STOR Miniport 2.76.002.001
			STOR Miniport 2.76.003.001
			STOR Miniport 10.0.720.0
			STOR Miniport 10.2.261.4
			STOR Miniport 10.2.370.8
			STOR Miniport 10.4.246.0
			STOR Miniport 10.6.114.0
			STOR Miniport 10.7.110.20
			STOR Miniport 11.0.247.0
			STOR Miniport 11.1.145.16

			STOR Miniport 11.2.139.0
			STOR Miniport 11.4.142.11
			STOR Miniport 11.4.204.8
			STOR Miniport 12.0.193.13
			STOR Miniport 12.0.257.9
			STOR Miniport 12.0.318.0
			STOR Miniport 12.0.367.0
			STOR Miniport 12.2.207.0
			STOR Miniport 12.2.284.0
			STOR Miniport 12.4.243.4
			STOR Miniport 12.6.165.0
			STOR Miniport 12.8.334.6
		QLogic	Bundle
			STOR Miniport 3.2.5.0
			STOR Miniport 9.1.11.3
			STOR Miniport 9.1.11.24
			STOR Miniport 9.1.11.28
			STOR Miniport 9.1.12.21
			STOR Miniport 9.1.13.20
			STOR Miniport 9.1.15.20
			STOR Miniport 9.1.15.21
			STOR Miniport 9.1.17.21
			STOR Miniport 9.1.17.22
			STOR Miniport 9.1.17.25

			STOR Miniport 9.1.18.20
			STOR Miniport 9.2.1.20
			STOR Miniport 9.2.2.20
			STOR Miniport 9.2.3.20
			STOR Miniport 9.2.4.21
			STOR Miniport 9.2.5.20
			STOR Miniport 9.2.5.21
			STOR Miniport 9.2.6.20
			STOR Miniport 9.2.6.22
			STOR Miniport 9.2.8.20
			STOR Miniport 9.2.9.20
			STOR Miniport 9.2.9.22
			STOR Miniport 9.2.9.23
			STOR Miniport 9.4.1.20 (*2)
		Hitachi Compute Blade	Bundle (*1)
			STOR Miniport 4.4.8.2280
		HPE	STOR Miniport 9.1.11.24
			STOR Miniport 9.1.11.28
			STOR Miniport 9.1.12.22
			STOR Miniport 9.1.14.22
			STOR Miniport 9.1.15.21
			STOR Miniport 9.1.17.22
			STOR Miniport 9.1.17.25
			STOR Miniport 9.2.4.21

			STOR Miniport 10.2.370.8
			STOR Miniport 10.4.246.0
			STOR Miniport 10.6.114.0
			STOR Miniport 10.7.110.20
			STOR Miniport 11.1.145.16
		Brocade	STOR Miniport 3.2.4.0
			STOR Miniport 3.2.5.0
	iSCSI	Microsoft	Bundle
		Emulex	STOR Miniport 4.9.160.0
			STOR Miniport 10.0.732.0
			STOR Miniport 10.2.370.9
			STOR Miniport 10.2.421.0
			STOR Miniport 10.4.245.0
			STOR Miniport 10.6.116.0
			STOR Miniport 11.0.271.0
			STOR Miniport 11.1.185.0
			STOR Miniport 11.2.1153.23
		STOR Miniport 11.4.1174.0	
		QLogic	STOR Miniport 2.1.5.38
	STOR Miniport 2.1.6.10		
Fibre Channel over Ethernet	Emulex	STOR Miniport 2.76.002.001	
		STOR Miniport 2.76.003.001	
		STOR Miniport 10.0.720.0	
		STOR Miniport 10.2.261.4	

			STOR Miniport 10.2.370.8
			STOR Miniport 10.4.246.0
			STOR Miniport 10.6.114.0
			STOR Miniport 10.7.110.20
			STOR Miniport 11.0.247.0
			STOR Miniport 11.1.145.16
			STOR Miniport 11.2.1135.0
			STOR Miniport 11.4.1162.0
		QLogic	STOR Miniport 3.2.5.0
			STOR Miniport 9.1.11.12
			STOR Miniport 9.1.11.16
			STOR Miniport 9.1.12.10
			STOR Miniport 9.1.13.10
		HPE	STOR Miniport 2.76.003.001
			STOR Miniport 7.10.31.0
			STOR Miniport 7.12.41.0
			STOR Miniport 7.13.4.0
			STOR Miniport 7.14.0.0 or later
			STOR Miniport 10.2.261.4
			STOR Miniport 10.4.246.0
			STOR Miniport 10.7.110.20
			STOR Miniport 11.1.145.16
		Brocade	STOR Miniport 3.2.3.1
			STOR Miniport 3.2.4.0

			STOR Miniport 3.2.5.0
		Cisco	STOR Miniport 2.3.0.20
			STOR Miniport 2.4.0.8
			STOR Miniport 2.4.0.9
			STOR Miniport 2.4.0.11
			STOR Miniport 2.4.0.13
			STOR Miniport 2.4.0.19
			STOR Miniport 2.4.0.20

3) For Hitachi storage system (Windows 2016 with no service Pack)

OS	HBA		Driver
Windows 2016 (x64)	Fibre Channel	Emulex	Bundle
			STOR Miniport 11.0.247.8000
			STOR Miniport 11.1.145.16
			STOR Miniport 11.2.139.0
			STOR Miniport 11.4.142.11
			STOR Miniport 11.4.204.8
			STOR Miniport 11.4.334.7
			STOR Miniport 12.0.193.13
			STOR Miniport 12.0.257.9
			STOR Miniport 12.0.318.0
			STOR Miniport 12.0.367.0
			STOR Miniport 12.2.207.0
			STOR Miniport 12.2.284.0

			STOR Miniport 12.4.243.4
			STOR Miniport 12.6.165.0
			STOR Miniport 12.8.334.6
			STOR Miniport 12.8.351.7
		QLogic	Bundle
			STOR Miniport 9.1.15.1
			STOR Miniport 9.1.17.25
			STOR Miniport 9.2.2.20
			STOR Miniport 9.2.3.20
			STOR Miniport 9.2.4.21
			STOR Miniport 9.2.5.20
			STOR Miniport 9.2.5.21
			STOR Miniport 9.2.6.20
			STOR Miniport 9.2.6.22
			STOR Miniport 9.2.8.20
			STOR Miniport 9.2.9.20
			STOR Miniport 9.2.9.22
			STOR Miniport 9.2.9.23
			STOR Miniport 9.4.1.20 (*2)
		STOR Miniport 9.4.2.20 (*2)	
		STOR Miniport 9.4.5.20 (*2)	
		Hitachi Compute Blade	Bundle (*1)
		HPE	STOR Miniport 9.1.17.25
			STOR Miniport 9.2.4.21

			STOR Miniport 11.1.145.16
	iSCSI	Microsoft	Bundle
		Emulex	STOR Miniport 11.1.185.0
			STOR Miniport 11.2.1153.23
			STOR Miniport 11.4.1174.0
	QLogic		STOR Miniport 2.1.6.10
	Fibre Channel over Ethernet	Emulex	Bundle
			STOR Miniport 11.0.247.8000
			STOR Miniport 11.1.145.16
			STOR Miniport 11.2.1135.0
			STOR Miniport 11.4.1162.0
		QLogic	Bundle
			STOR Miniport 9.1.11.3
		HPE	STOR Miniport 7.14.0.0 or later
			STOR Miniport 11.1.145.16
		Cisco	STOR Miniport 3.0.0.7
			STOR Miniport 3.0.0.8
			STOR Miniport 3.1.0.11
			STOR Miniport 3.2.0.14

4) For Hitachi storage system (Windows 2019 with no service Pack)

OS	HBA		Driver
Windows 2019 (x64)	Fibre Channel	Emulex	Bundle
			STOR Miniport 11.4.225.8009

			STOR Miniport 12.0.298.0	
			STOR Miniport 12.0.318.0	
			STOR Miniport 12.0.367.0	
			STOR Miniport 12.2.207.0	
			STOR Miniport 12.4.243.4	
			STOR Miniport 12.6.165.0	
			STOR Miniport 12.8.334.6	
			STOR Miniport 12.8.351.7	
	QLogic			Bundle
				STOR Miniport 9.1.15.1
				STOR Miniport 9.2.8.21
				STOR Miniport 9.2.9.22
				STOR Miniport 9.2.9.23
				STOR Miniport 9.4.1.20 (*2)
				STOR Miniport 9.4.2.20 (*2)
	STOR Miniport 9.4.5.20 (*2)			
	iSCSI	Microsoft		Bundle
	Fibre Channel over Ethernet	Emulex		Bundle
				STOR Miniport 11.0.247.8000
		QLogic		Bundle
				STOR Miniport 7.14.15.2

5) For Hitachi storage system (Windows 2022 with no service Pack)

OS	HBA		Driver
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Windows 2022 (x64)	Fibre Channel	Emulex	Bundle
			STOR Miniport 12.6.165.8000
			STOR Miniport 12.8.351.7
		STOR Miniport 12.8.518.0	
		QLogic	Bundle (*2)
			STOR Miniport 9.4.2.103 (*2)
	STOR Miniport 9.4.5.20 (*2)		
	iSCSI	Microsoft	Bundle
	Fibre Channel over Ethernet	Emulex	Bundle
			STOR Miniport 11.0.247.8000
QLogic		Bundle	
		STOR Miniport 7.14.22.101	

Notes:

*1: All drivers applied to Hitachi HBA cards for Hitachi Compute Blade are supported.

*2: For 2700 series adapters and 2800 series adapters, when a failed path is recovered while the server is stopped, and the host is restarted, a disconnection error might occur. A server restart is required to recover the path.

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