

Hitachi Dynamic Link Manager (for Linux®) 8.1.2-00 Release Notes

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About this document

This document (RN-00HS284-41, February 2015) provides late-breaking information about the Hitachi Dynamic Link Manager (for Linux) 8.1.2-00. 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 Data Systems partners who license and use the Hitachi Dynamic Link Manager (for Linux).

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

This release is a major release that adds new features and fixes bug.

Product package contents

Medium	CD-ROM	Revision	Release Type
Software	Hitachi Dynamic Link Manager (for Linux)	8.1.2-00	Full Package
Documents	Release Notes (this document)		
	MK-92DLM113-30		
	Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide		
	Statement of Delivery and Usage Consent Form		

New features and important enhancements

[8.1.2-00 Additional Functions and Modifications]

- (1) Functionality for specifying the number of times the same path can be used for extended load balancing (random I/O) is now supported.

System requirements

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

Host

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

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

Supported OSs in a HAM environment are listed below:

System requirements

Supported OS
Red Hat Enterprise Linux AS4/ES4(x86/x64/IPF)
Red Hat Enterprise Linux 5(x86/x64/IPF)
SUSE LINUX Enterprise Server 9(x86/x64/IPF)
SUSE LINUX Enterprise Server 10(x86/x64/IPF)

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 subsystems, refer to the following manual:

- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Storage Subsystems Supported by HDLM

Requirements to use a HAM environment are as follows:

- HDLM supports the HAM functionality of the following storage system:
 - Hitachi Universal Storage Platform V/VM
 - Hitachi Virtual Storage Platform
 - HP XP24000/XP20000
 - HP P9500
 - Hitachi Unified Storage VM

The required microprogram versions are listed below:

Storage system	Interface	Microprogram version	Remark
Universal Storage Platform V/VM	FC I/F	60-06-05-XX/XX or later	X: voluntary number
Virtual Storage Platform	FC I/F	70-01-42-XX/XX or later (*1)	X: voluntary number
XP24000/XP20000	FC I/F	60-06-05-XX/XX or later	X: voluntary number
P9500	FC I/F	70-01-42-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 HAM functionality with USP V or XP24000, apply 70-03-00-XX/XX or later.

Virtualization

The virtualization to which HDLM can be applied is shown below:

Hitachi Virtualization Manager (BladeSymphony with Itanium 2 server modules)

Xen (Virtualization) in SUSE LINUX Enterprise Server 10 SP2, SP3, SP4, SUSE LINUX Enterprise Server 11, and SUSE LINUX Enterprise Server 11 SP1, SP3

KVM (Virtualization) in Red Hat Enterprise Linux 5.4 Advanced Platform, Red Hat Enterprise Linux 5.4, Red Hat Enterprise Linux 5.5 Advanced Platform, Red Hat Enterprise Linux 5.5, Red Hat Enterprise Linux 5.6 Advanced Platform, Red Hat Enterprise Linux 5.6, Red Hat Enterprise Linux 5.7 Advanced Platform, Red Hat Enterprise Linux 5.7, Red Hat Enterprise Linux 5.8 Advanced Platform, Red Hat Enterprise Linux 5.8, Red Hat Enterprise Linux 5.9 Advanced Platform, Red Hat Enterprise Linux 5.9, Red Hat Enterprise Linux 5.10 Advanced Platform, Red Hat Enterprise Linux 5.10, Red Hat Enterprise Linux 5.11 Advanced Platform, Red Hat Enterprise Linux 5.11, Red Hat Enterprise Linux 6, Red Hat Enterprise Linux 6.1, Red Hat Enterprise Linux 6.2, Red Hat Enterprise Linux 6.3, Red Hat Enterprise Linux 6.4, Red Hat Enterprise Linux 6.5, Red Hat Enterprise Linux 6.6, Red Hat Enterprise Linux 7, Oracle Linux 7, Oracle Unbreakable Enterprise Kernel 5.6, Oracle Unbreakable Enterprise Kernel 5.7, Oracle Unbreakable Enterprise Kernel 5.8, Oracle Unbreakable Enterprise Kernel 6.2, Oracle Unbreakable Enterprise Kernel 6.3, Oracle Unbreakable Enterprise Kernel 6.4, Oracle Unbreakable Enterprise Kernel 6.5, and Oracle Unbreakable Enterprise Kernel 7

Operating systems requirements

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

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

Prerequisite programs

None.

Related programs

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

- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Red Hat Enterprise Linux AS4/ES4
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Red Hat Enterprise Linux 5
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Red Hat Enterprise Linux 6
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Red Hat Enterprise Linux 7
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using SUSE LINUX Enterprise Server 10
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using SUSE LINUX Enterprise Server 11
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Enterprise Linux 4
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Enterprise Linux 5
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Unbreakable Enterprise Kernel 5
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Unbreakable Enterprise Kernel 6
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Linux 7

Resolved problems

- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Unbreakable Enterprise Kernel 7

Memory and disk space requirements

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

- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Memory and Disk Space Requirements

HDLM supported configurations

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

- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Number of Paths Guaranteed in HDLM

Resolved problems

[8.1.2-00 Modifications]

None.

Known problems

If an environment is created in which HDLM is installed on the boot disk, the server is started, and a module name contains a hyphen (-), even if the module is successfully loaded, a message indicating that the module failed to load (KAPL12324-E) might be output to the console and the `/etc/opt/DynamicLinkManager/hdlmboot.log` file.

After the server has started, execute the `lsmod` command. If the hyphens in module names are changed and displayed as underscores (_), then there are no problems, and the action for the KAPL12324-E message in the Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide does not need to be taken.

Message output example (example of an error occurring for `dm-region-hash`)

```
# vi /etc/opt/DynamicLinkManager/hdlmboot.log
```

```
:
```

```
KAPL12323-I The insertion of the module was started. Module name = dm-log
```

```
KAPL12323-I The insertion of the module was started. Module name = dm-region-hash
```

```
KAPL12324-E The module could not be inserted. Module name = dm-region-hash
```

```
KAPL12323-I The insertion of the module was started. Module name = dm-mirror
```

Known problems

```
:  
#
```

Example of using `lsmod` to confirm that there are no problems (example of confirming the information displayed for `dm_region_hash`)

```
# lsmod  
  
:  
dm_mirror          14003  0  
dm_region_hash     12200  1 dm_mirror  
dm_log             10088  2 dm_mirror,dm_region_hash  
  
:  
#
```

Operation when all paths are disconnected during intermittent error monitoring:

When I/O operations are performed continuously for an LU whose paths are all Offline(E), Online(E), or Offline(C) (because, for example, all paths have been disconnected), the number of times that an error occurs (the IEP value when `dlkmgr view -path -iem` is executed) during intermittent error monitoring might increase even though the auto failback function did not recover all paths. In such a case, even though an intermittent error did not occur, HDLM often assumes an intermittent error, and excludes paths from the auto failback function. In such a case, after recovery from the failure, to change the status of a path excluded from auto failback to online, manually change the status to online.

Although the following messages are output when executing the "`rpm -V HDLM`" command, HDLM operations are not affected.

In Red Hat Enterprise Linux AS4/ES4 (IA32/IPF),
Red Hat Enterprise Linux AS4.5/ES4.5 (IA32/IPF),
Red Hat Enterprise Linux AS4.6/ES4.6 (IA32/IPF),
Red Hat Enterprise Linux AS4.7/ES4.7 (IA32/IPF),
Red Hat Enterprise Linux AS4.8/ES4.8 (IA32/IPF),
Red Hat Enterprise Linux AS4.9/ES4.9 (IA32/IPF),
Red Hat Enterprise Linux 5 Advanced Platform (IA32/IPF),
Red Hat Enterprise Linux 5 (IA32/IPF),
Red Hat Enterprise Linux 5.1 Advanced Platform (IA32/IPF),
Red Hat Enterprise Linux 5.1 (IA32/IPF),
Red Hat Enterprise Linux 5.2 Advanced Platform (IA32/IPF),
Red Hat Enterprise Linux 5.2 (IA32/IPF),
Red Hat Enterprise Linux 5.3 Advanced Platform (IA32/IPF),
Red Hat Enterprise Linux 5.3 (IA32/IPF),
Red Hat Enterprise Linux 5.4 Advanced Platform (IA32/IPF),
Red Hat Enterprise Linux 5.4 (IA32/IPF),

Known problems

Red Hat Enterprise Linux 5.5 Advanced Platform (IA32/IPF),
Red Hat Enterprise Linux 5.5 (IA32/IPF),
Red Hat Enterprise Linux 5.6 Advanced Platform (IA32/IPF),
Red Hat Enterprise Linux 5.6 (IA32/IPF),
Red Hat Enterprise Linux 5.7 Advanced Platform (IA32/IPF),
Red Hat Enterprise Linux 5.7 (IA32/IPF),
Red Hat Enterprise Linux 5.8 Advanced Platform (IA32/IPF),
Red Hat Enterprise Linux 5.8 (IA32/IPF),
Red Hat Enterprise Linux 5.9 Advanced Platform (IA32/IPF),
Red Hat Enterprise Linux 5.9 (IA32/IPF),
Red Hat Enterprise Linux 5.10 Advanced Platform (IA32/IPF),
Red Hat Enterprise Linux 5.10 (IA32/IPF),
Red Hat Enterprise Linux 5.11 Advanced Platform (IA32/IPF),
Red Hat Enterprise Linux 5.11 (IA32/IPF),
Red Hat Enterprise Linux 6 (IA32),
Red Hat Enterprise Linux 6.1 (IA32),
Red Hat Enterprise Linux 6.2 (IA32),
Red Hat Enterprise Linux 6.3 (IA32),
Red Hat Enterprise Linux 6.4 (IA32),
Red Hat Enterprise Linux 6.5 (IA32),
Red Hat Enterprise Linux 6.6 (IA32),
Oracle Enterprise Linux 4 Update 5 (IA32),
Oracle Enterprise Linux 4 Update 6 (IA32),
Oracle Enterprise Linux 5 Update 1 (IA32),
Oracle Enterprise Linux 5.4 (IA32),
Oracle Enterprise Linux 5.5 (IA32),
Oracle Enterprise Linux 5.6 (IA32),
Oracle Unbreakable Enterprise Kernel 5.7 (IA32),
Oracle Unbreakable Enterprise Kernel 5.8 (IA32),
Oracle Unbreakable Enterprise Kernel 6.2 (IA32),
Oracle Unbreakable Enterprise Kernel 6.3 (IA32),
Oracle Unbreakable Enterprise Kernel 6.4 (IA32), and
Oracle Unbreakable Enterprise Kernel 6.5 (IA32)

missing /etc/opt/DynamicLinkManager/dlmmgr_e.xml

- In case of Red Hat Enterprise Linux AS4/ES4 (EM64T/AMD64),
Red Hat Enterprise Linux AS4.5/ES4.5 (EM64T/AMD64),
Red Hat Enterprise Linux AS4.6/ES4.6 (EM64T/AMD64),
Red Hat Enterprise Linux AS4.7/ES4.7 (EM64T/AMD64),
Red Hat Enterprise Linux AS4.8/ES4.8 (EM64T/AMD64),
Red Hat Enterprise Linux AS4.9/ES4.9 (EM64T/AMD64),
Red Hat Enterprise Linux 5 Advanced Platform (EM64T/AMD64),
Red Hat Enterprise Linux 5 (EM64T/AMD64),
Red Hat Enterprise Linux 5.1 Advanced Platform (EM64T/AMD64),
Red Hat Enterprise Linux 5.1 (EM64T/AMD64),
Red Hat Enterprise Linux 5.2 Advanced Platform (EM64T/AMD64),
Red Hat Enterprise Linux 5.2 (EM64T/AMD64),
Red Hat Enterprise Linux 5.3 Advanced Platform (EM64T/AMD64),
Red Hat Enterprise Linux 5.3 (EM64T/AMD64),

Known problems

Red Hat Enterprise Linux 5.4 Advanced Platform (EM64T/AMD64),
Red Hat Enterprise Linux 5.4 (EM64T/AMD64),
Red Hat Enterprise Linux 5.5 Advanced Platform (EM64T/AMD64),
Red Hat Enterprise Linux 5.5 (EM64T/AMD64),
Red Hat Enterprise Linux 5.6 Advanced Platform (EM64T/AMD64),
Red Hat Enterprise Linux 5.6 (EM64T/AMD64),
Red Hat Enterprise Linux 5.7 Advanced Platform (EM64T/AMD64),
Red Hat Enterprise Linux 5.7 (EM64T/AMD64),
Red Hat Enterprise Linux 5.8 Advanced Platform (EM64T/AMD64),
Red Hat Enterprise Linux 5.8 (EM64T/AMD64),
Red Hat Enterprise Linux 5.9 Advanced Platform (EM64T/AMD64),
Red Hat Enterprise Linux 5.9 (EM64T/AMD64),
Red Hat Enterprise Linux 5.10 Advanced Platform (EM64T/AMD64),
Red Hat Enterprise Linux 5.10 (EM64T/AMD64),
Red Hat Enterprise Linux 5.11 Advanced Platform (EM64T/AMD64),
Red Hat Enterprise Linux 5.11 (EM64T/AMD64),
Red Hat Enterprise Linux 6 (EM64T/AMD64),
Red Hat Enterprise Linux 6.1 (EM64T/AMD64),
Red Hat Enterprise Linux 6.2 (EM64T/AMD64),
Red Hat Enterprise Linux 6.3 (EM64T/AMD64),
Red Hat Enterprise Linux 6.4 (EM64T/AMD64),
Red Hat Enterprise Linux 6.5 (EM64T/AMD64),
Red Hat Enterprise Linux 6.6 (EM64T/AMD64),
Red Hat Enterprise Linux 7 (EM64T/AMD64),
Oracle Enterprise Linux 4 Update 5 (EM64T/AMD64),
Oracle Enterprise Linux 4 Update 6 (EM64T/AMD64),
Oracle Enterprise Linux 5 Update 1 (EM64T/AMD64),
Oracle Enterprise Linux 5.4 (EM64T/AMD64),
Oracle Enterprise Linux 5.5 (EM64T/AMD64),
Oracle Enterprise Linux 5.6 (EM64T/AMD64),
Oracle Linux 7 (EM64T/AMD64),
Oracle Unbreakable Enterprise Kernel 5.6 (EM64T/AMD64),
Oracle Unbreakable Enterprise Kernel 5.7 (EM64T/AMD64),
Oracle Unbreakable Enterprise Kernel 5.8 (EM64T/AMD64),
Oracle Unbreakable Enterprise Kernel 6.2 (EM64T/AMD64),
Oracle Unbreakable Enterprise Kernel 6.3 (EM64T/AMD64),
Oracle Unbreakable Enterprise Kernel 6.4 (EM64T/AMD64),
Oracle Unbreakable Enterprise Kernel 6.5 (EM64T/AMD64), and
Oracle Unbreakable Enterprise Kernel 7 (EM64T/AMD64)

```
missing /etc/opt/DynamicLinkManager/dlmmgr_e.xml
missing /opt/DynamicLinkManager/lib/libdlm.so_32
missing /opt/DynamicLinkManager/lib/libdlmogui_jni.so_32
missing /opt/DynamicLinkManager/lib/libhdlmhcc-x.x.x.so_32
(*1)
missing /opt/DynamicLinkManager/lib/libhdlmhccmp-x.x.x.so_32
```

Known problems

(*1)

- SUSE LINUX Enterprise Server 10 (IA32/IPF), and
SUSE LINUX Enterprise Server 11 (IA32/IPF)

missing /etc/opt/DynamicLinkManager/dlmmgr_e.xml

- SUSE LINUX Enterprise Server 10 (EM64T/AMD64), and
SUSE LINUX Enterprise Server 11 (EM64T/AMD64)

missing /etc/opt/DynamicLinkManager/dlmmgr_e.xml

missing /opt/DynamicLinkManager/lib/libdlm.so_32

missing /opt/DynamicLinkManager/lib/libdlmgui_jni.so_32

missing /opt/DynamicLinkManager/lib/libhdlmhcc-x.x.x.so_32

(*1)

missing /opt/DynamicLinkManager/lib/libhdlmhccmp-x.x.x.so_32

(*1)

Notes:

*1: voluntary number.

While installation and uninstallation of HDLM are performed, do not interrupt the processing (for example, do not press the Ctrl+C keys).

If there are 1025 or more paths, including those other than Online, you cannot execute the dlmchname utility.

If the operation is performed with the following procedure, the status is returned to what it was before the refresh operation was executed. As a result, make sure to re-execute the refresh command after restarting the host and recovering from a path failure.

(a) The dlnkmgr command is used to perform a refresh.

(b) Path errors occur for some or all of the paths, and a path status becomes Offline(E).

(c) The host is restarted before a path failure is recovered.

The partition numbers that can be used for HDLM management targets are from 1 to 15. A partition number of 16 or higher can be assigned in UEFI, but a SCSI device with a partition number of 16 or higher cannot be used for an HDLM management target.

An HDLM device cannot be specified on a boot disk in a RHEL7 and Oracle Linux 7 environment

The KAPL12354-E error occurs when an initial RAM disk image file is created for HDLM.

Execution example:

```
# dracut /boot/initramfs-3.10.0-123.el7.x86_64.img `uname -r`
```

KAPL12354-E In the current OS version, HDLM does not support the boot disk.

```
#
```

Closing known problems

None.

Installation precautions

For Hitachi Dynamic Link Manager 6.5.0 and later, the HDLM installation media has been changed to a DVD-ROM. Also, the directory structure of the HDLM installation media has changed.

Refer to `Contents_list.txt` on the HDLM installation media, and then replace the descriptions regarding the HDLM installation media directories in the Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide.

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

- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 2. HDLM Functions - Failover and Failback Using Path Switching
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Hosts and OSs Supported by HDLM
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Red Hat Enterprise Linux AS4/ES4
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Red Hat Enterprise Linux 5
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Red Hat Enterprise Linux 6
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Red Hat Enterprise Linux 7
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using SUSE LINUX Enterprise Server 10

Installation precautions

- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using SUSE LINUX Enterprise Server 11
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Enterprise Linux 4
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Enterprise Linux 5
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Unbreakable Enterprise Kernel 5
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Unbreakable Enterprise Kernel 6
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Linux 7
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Unbreakable Enterprise Kernel 7
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - Knowledge Required Before You Install HDLM
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - Notes on Creating an HDLM Environment
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - Installing HDLM for Managing Boot Disks - Notes on Installing HDLM in a Boot Disk Environment
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - The Process-specific-trace Information File - Notes on Using the Hitachi Network Objectplaza Trace Library

Updating installation of HDLM precautions

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

- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - Notes on Creating an HDLM Environment - Notes on Installing HDLM

Uninstallation precautions

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

- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - Canceling the Settings for HDLM - Uninstalling HDLM

System generation precautions

None.

Usage precautions

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

- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 2. HDLM Functions - Load Distribution Using Load Balancing - Algorithms for Load Balancing
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 2. HDLM Functions - Failover and Failback Using Path Switching - Path Status Transition
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 2. HDLM Functions - Cluster Support
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Red Hat Enterprise Linux AS4/ES4
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Red Hat Enterprise Linux 5
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Red Hat Enterprise Linux 6
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Red Hat Enterprise Linux 7
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using SUSE LINUX Enterprise Server 10
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using SUSE LINUX Enterprise Server 11
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Enterprise Linux 4

- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Enterprise Linux 5
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Unbreakable Enterprise Kernel 5
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Unbreakable Enterprise Kernel 6
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Linux 7
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - HDLM System Requirements - Related Products When Using Oracle Unbreakable Enterprise Kernel 7
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - Settings for md Devices - Notes on Settings Up md Devices
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - Settings for LVM
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - Settings for Oracle RAC
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - Settings for the RHCM - Notes on Using RHCM
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - Canceling the Settings for HDLM - Canceling the Settings for LVM
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 3. Creating an HDLM Environment - Canceling the Settings for HDLM - Uninstalling HDLM
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 4. HDLM Operation - Notes on Using HDLM
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 4. HDLM Operation - Notes on Using Commands
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 4. HDLM Operation - HDLM Operations Using Commands - Updating the License
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 4. HDLM Operation - Starting and Stopping the HDLM Manager
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 4. HDLM Operation - Reconfiguring the HDLM Operating Environment - Changing the HDLM Device Configuration

Usage precautions

- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 5. Troubleshooting - Actions Taken for a Path Error - Place the Path Online
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 6. Command Reference - Overview of the HDLM Command (dlnkmgr)
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 7. Utility Reference - Overview of the Utilities
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 7. Utility Reference - DLMgetras (Utility for Collecting HDLM Error Information) - Parameters
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 7. Utility Reference - dlmcfmgr (HDLM-Configuration Definition Utility) - Parameters
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 7. Utility Reference - dlmsetopt (Utility for Setting HDLM Driver Option)
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Chapter 8.Messages - Before Viewing the List of Messages - Components That Output Messages to syslog
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Notes on Linux Commands and Files
- Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide Differences in Functionality Between HDLM Versions

Additional Usage Precautions

Note that if descriptions include the term Red Hat Enterprise Linux or Red Hat Enterprise Linux 5, and there is no specific explanation about Red Hat Enterprise Linux 6, read them as Red Hat Enterprise Linux 6 when necessary.

When using an Emulex HBA driver, and if you execute the HDLM-configuration definition utility (dlmcfmgr -v), a hyphen (-) might be displayed in the Device column of the execution results.

To change to a status that does not display a hyphen, execute the dlmcfmgr utility with the -u parameter specified.

For details on the dlmcfmgr utility, see dlmcfmgr Utility for Managing the HDLM Configuration.

Settings of OS and other programs, which were changed at HDLM introduction, must be returned to the original settings after the uninstallation of HDLM.

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

Function	Item	Version number
HDLM command	HDLM Version	8.1.2-00

Usage precautions

(dlnkmgr)	HDLM Manager	8.1.2-00
	HDLM Alert Driver	8.1.2-00
	HDLM Driver	8.1.2-00

The following example shows the text displayed when `dlnkmgr view -sys` is executed.

```
# /opt/DynamicLinkManager/bin/dlnkmgr view -sys
HDLM Version           : 8.1.2-00
Service Pack Version   :
Load Balance           : on(extended lio)
Support Cluster        :
Elog Level              : 3
Elog File Size (KB)    : 9900
Number Of Elog Files   : 2
Trace Level            : 0
Trace File Size (KB)   : 1000
Number Of Trace Files  : 4
Path Health Checking   : on(30)
Auto Failback          : on(1)
Reservation Status     :
Intermittent Error Monitor : off
Dynamic I/O Path Control : off(10)
HDLM Manager Ver      WakeupTime
Alive      8.1.2-00    2015/01/15 19:03:42
HDLM Alert Driver Ver  WakeupTime      ElogMem Size
Alive      8.1.2-00    2015/01/15 19:02:21    1000
HDLM Driver Ver       WakeupTime
Alive      8.1.2-00    2015/01/15 19:02:24
License Type Expiration
Temporary  2015/01/17(2days after)
KAPL01001-I The HDLM command completed normally. Operation
name = view, completion time = 2015/01/15 20:22:01
```

This version of HDLM does not support the virtualization (the Xen function) provided by Red Hat Enterprise Linux AS4.5/ES4.5, Red Hat Enterprise Linux AS4.6/ES4.6, Red Hat Enterprise Linux AS4.7/ES4.7, Red Hat Enterprise Linux AS4.8/ES4.8, Red Hat Enterprise Linux AS4.9/ES4.9, Red Hat Enterprise Linux 5 Advanced Platform, Red Hat Enterprise Linux 5, Red Hat Enterprise Linux 5.1

Usage precautions

Advanced Platform, Red Hat Enterprise Linux 5.1, Red Hat Enterprise Linux 5.2
Advanced Platform, Red Hat Enterprise Linux 5.2, Red Hat Enterprise Linux 5.3
Advanced Platform, Red Hat Enterprise Linux 5.3, Red Hat Enterprise Linux 5.4
Advanced Platform, Red Hat Enterprise Linux 5.4, Red Hat Enterprise Linux 5.5
Advanced Platform, Red Hat Enterprise Linux 5.5, Red Hat Enterprise Linux 5.6
Advanced Platform, Red Hat Enterprise Linux 5.6, Red Hat Enterprise Linux 5.7
Advanced Platform, Red Hat Enterprise Linux 5.7, Red Hat Enterprise Linux 5.8
Advanced Platform, Red Hat Enterprise Linux 5.8, Red Hat Enterprise Linux 5.9
Advanced Platform, Red Hat Enterprise Linux 5.9, Red Hat Enterprise Linux 5.10
Advanced Platform, Red Hat Enterprise Linux 5.10, Red Hat Enterprise Linux 5.11
Advanced Platform, Red Hat Enterprise Linux 5.11, Red Hat Enterprise Linux 6,
Red Hat Enterprise Linux 6.1, Red Hat Enterprise Linux 6.2, Red Hat Enterprise
Linux 6.3, Red Hat Enterprise Linux 6.4, Red Hat Enterprise Linux 6.5, Red Hat
Enterprise Linux 6.6, Red Hat Enterprise Linux 7, and Oracle Linux 7. HDLM
cannot be used in the domain 0 and the domain U of the virtualization (the Xen
function).

HDLM cannot be installed on an unsupported OS. Even if the installation is
successful, the operation cannot be guaranteed.

If HDLM is used with LifeKeeper for Linux, the following message may be output
to the LifeKeeper for Linux log, but there is no effect on operation:

```
quickCheck: The daemon "dlmmgr" was restarted by quickCheck.
```

```
quickCheck: The daemon "dlmmgr" does not appear to be running and could not  
be restarted.
```

Path failures may not be correctly handled without this daemon.

Execute the following command to check whether the HDLM manager is running:

```
# /opt/DynamicLinkManager/bin/dlnkmgr view -sys -msrv
```

```
HDLM Manager Ver    WakeupTime  
Alive              8.1.2-00 yyyy/mm/dd hh:mm:ss
```

```
KAPL01001-I The HDLM command ended successfully. (operation name = view,  
end time = yyyy/mm/dd hh:mm:ss)
```

When all of the following conditions are met, if you execute the shutdown
command with specifying the -F option which always executes fsck at reboot, a
host boot fails with an error in the fsck command which is executed at the OS
boot.

If your environment meets the conditions, do not specify the -F option for the
shutdown command. If you do execute the shutdown command with the -F
option specified, when the setup screen for the boot loader startup is displayed,
select the startup from the SCSI device and boot the host. After that, reboot the
host without specifying the -F option.

Conditions

- Red Hat Enterprise Linux AS4/ES4, Red Hat Enterprise Linux 5, Oracle Enterprise Linux 4, Oracle Enterprise Linux 5, or Oracle Unbreakable Enterprise Kernel 5 is used.
- An HDLM device is used as a boot disk.
- A value other than 0 is set for the sixth field (fs_passno) in the /etc/fstab file.
- UTC is not used for the system clock on the host.

If you restart the host, the route information changes and an increased number of offline (E) paths per LU might be displayed. If the number of online paths per LU is the same as before the host was restarted, remove unnecessary offline (E) paths by using `dlnmcmgr -u {HDLM device}`.

In Red Hat Enterprise Linux 6, Oracle Unbreakable Enterprise Kernel 5, Oracle Unbreakable Enterprise Kernel 6, and SUSE LINUX Enterprise Server 11:

If you execute the `dlnmcmgr` utility (`dlnmcmgr -u`), path information is deleted when a path failure occurs. The path information is deleted even if a hyphen (-) is not displayed for an SCSI device name in the device row displayed as a result of executing the `dlnmcmgr` utility or the HDLM command view operation (specifying `-lu` or `-drv`).

If path information is deleted as described above, execute `dlnmcmgr -r` after recovering the failed path, make sure the recovered path is discovered by HDLM, and then confirm that the path status has become online.

HDLM for Linux does not support cluster software in a HAM environment.

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 of it.

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.

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 `dlnmcmgr 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 before the HAM pair is created, restart the host after the HAM pair is created.

Documentation

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

While the path health check provided by HDLM is enabled (on), if a HAM pair is released, the status of the paths (non-owner paths) connected to the RCU might become `Offline(E)` or `Online(E)`. After creating (recovering) a HAM pair, return the status of the paths to `Online` by using the HDLM command `online` operation.

Documentation

Available documents

Manual Name	Manual No.	Issue Date
Hitachi Command Suite Dynamic Link Manager (for Linux®) User Guide	MK-92DLM113-30	February, 2015

Appendix A

Host bus adapter (HBA) support matrix

Use the Fibre Channel I/F adapters given below. When using two or more adapters, use the same type of adapter. If you combine different types of HBA, HDLM may not be able to switch a path when an error occurs.

(1) QLogic (*1)

OS	Kernel	Driver
Red Hat Enterprise Linux AS4/ES4 (IA32)	2.6.9-11.EL	8.00.00b21-k (*3)(*4)
	2.6.9-11.ELsmp	8.00.02 (*6)
	2.6.9-11.ELhugemem	8.01.01 (*6)
	2.6.9-34.EL	8.01.02-d4 (*3)(*4)
	2.6.9-34.ELsmp	8.01.06 (*6)
	2.6.9-34.ELhugemem	8.01.04
	2.6.9-34.0.2.EL	8.01.02-d4 (*3)(*4)
	2.6.9-34.0.2.ELsmp	8.01.04
	2.6.9-34.0.2.ELhugemem	
	2.6.9-42.EL	8.01.04-d7 (*3)(*4)
2.6.9-42.ELhugemem	8.01.06 (*2)(*6)	
2.6.9-42.ELsmp (*5)		
2.6.9-42.0.3.EL	8.01.04-d7 (*3)(*4)	
2.6.9-42.0.3.ELsmp	8.01.04-d8	
2.6.9-42.0.3.ELhugemem		
Red Hat Enterprise Linux AS4 (IA32)	2.6.9-42.EL	8.01.07.15 (*6)
	2.6.9-42.ELsmp	
	2.6.9-42.ELhugemem	
2.6.9-42.0.3.EL	2.6.9-42.0.3.EL	8.01.07.15 (*6)
	2.6.9-42.0.3.ELsmp	
	2.6.9-42.0.3.ELhugemem	
Red Hat Enterprise Linux AS4/ES4 (IPF)	2.6.9-11.EL	8.00.00b21-k (*3) 8.00.02 (*6) 8.01.01 (*6)
	2.6.9-34.EL	8.01.02-d4 (*3) 8.01.06 (*6) 8.01.04

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OS	Kernel	Driver
	2.6.9-42.EL	8.01.04-d7 (*3) 8.01.06 (*2)(*6) 8.01.04-d8
	2.6.9-42.0.3.EL	8.01.04-d7 (*3) 8.01.04-d8
Red Hat Enterprise Linux AS4 (IPF)	2.6.9-42.EL	8.01.07.15 (*6)
	2.6.9-42.0.3.EL	8.01.07.15 (*6)
Red Hat Enterprise Linux AS4/ES4 (EM64T/AMD64)	2.6.9-11.EL	8.00.00b21-k (*3)(*4)
	2.6.9-11.ELsmp	8.00.02 (*6) 8.01.01 (*6)
	2.6.9-34.EL	8.01.02-d4 (*3)(*4)
	2.6.9-34.ELsmp	8.01.06 (*6)
	2.6.9-34.ELlargesmp	8.01.04
	2.6.9-34.0.2.EL	8.01.02-d4 (*3)(*4)
	2.6.9-34.0.2.ELsmp	8.01.04
	2.6.9-34.0.2.ELlargesmp	
	2.6.9-42.EL	8.01.04-d7 (*3)(*4)
	2.6.9-42.ELsmp	8.01.06 (*2)(*6)
2.6.9-42.ELlargesmp	8.01.04-d8	
	2.6.9-42.0.3.EL	8.01.04-d7 (*3)(*4)
	2.6.9-42.0.3.ELsmp	8.01.04-d8
	2.6.9-42.0.3.ELlargesmp	
Red Hat Enterprise Linux AS4 (EM64T/AMD64)	2.6.9-42.EL	8.01.07.15 (*6)
	2.6.9-42.ELsmp	
	2.6.9-42.ELlargesmp	
	2.6.9-42.0.3.EL	8.01.07.15 (*6)
	2.6.9-42.0.3.ELsmp	
	2.6.9-42.0.3.ELlargesmp	
Red Hat Enterprise Linux AS4.5/ES4.5 (IA32)	2.6.9-55.EL	8.01.04-d8 (*3)(*4)
	2.6.9-55.ELsmp	8.02.08 (*6)
	2.6.9-55.ELhugemem	8.02.14 (*6)
		8.02.23 (*6)
Red Hat Enterprise Linux AS4.5 (IA32)	2.6.9-55.EL	8.01.07.15 (*6)
	2.6.9-55.ELsmp	
	2.6.9-55.ELhugemem	
Red Hat Enterprise Linux AS4.5/ES4.5 (IPF)	2.6.9-55.EL	8.01.04-d8 (*3)
	2.6.9-55.ELlargesmp	8.02.08 (*6)
		8.02.14 (*6)
		8.02.23 (*6)

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OS	Kernel	Driver
Red Hat Enterprise Linux AS4.5/ES4.5 (IPF)	2.6.9-55.EL 2.6.9-55.ELlargesmp	8.01.07.15 (*6)
Red Hat Enterprise Linux AS4.5/ES4.5 (EM64T/AMD64)	2.6.9-55.EL 2.6.9-55.ELsmp 2.6.9-55.ELlargesmp	8.01.04-d8 (*3)(*4) 8.02.08 (*6) 8.02.14 (*6) 8.02.23 (*6)
Red Hat Enterprise Linux AS4.5 (EM64T/AMD64)	2.6.9-55.EL 2.6.9-55.ELsmp 2.6.9-55.ELlargesmp	8.01.07.15 (*6)
Red Hat Enterprise Linux AS4.6/ES4.6 (IA32)	2.6.9-67.EL 2.6.9-67.ELsmp 2.6.9-67.ELhugemem	8.01.07-d4 (*3)(*4) 8.02.08 (*6) 8.02.14 (*6) 8.02.23 (*6)
Red Hat Enterprise Linux AS4.6 (IA32)	2.6.9-67.EL 2.6.9-67.ELsmp 2.6.9-67.ELhugemem	8.01.07.15 (*6)
Red Hat Enterprise Linux AS4.6/ES4.6 (IPF)	2.6.9-67.EL 2.6.9-67.ELlargesmp	8.01.07-d4 (*3) 8.02.08 (*6) 8.02.14 (*6) 8.02.23 (*6)
Red Hat Enterprise Linux AS4.6 (IPF)	2.6.9-67.EL 2.6.9-67.ELlargesmp	8.01.07.15 (*6)
Red Hat Enterprise Linux AS4.6/ES4.6 (EM64T/AMD64)	2.6.9-67.EL 2.6.9-67.ELsmp 2.6.9-67.ELlargesmp	8.01.07-d4 (*3)(*4) 8.02.08 (*6) 8.02.14 (*6) 8.02.23 (*6)
Red Hat Enterprise Linux AS4.6 (EM64T/AMD64)	2.6.9-67.EL 2.6.9-67.ELsmp 2.6.9-67.ELlargesmp	8.01.07.15 (*6)
Red Hat Enterprise Linux AS4.7/ES4.7 (IA32)	2.6.9-78.EL 2.6.9-78.ELsmp 2.6.9-78.ELhugemem	8.02.09-d0 (*3)(*4) 8.02.08 (*6) 8.02.23 (*6)
Red Hat Enterprise Linux AS4.7 (IA32)	2.6.9-78.EL 2.6.9-78.ELsmp 2.6.9-78.ELhugemem	8.01.07.15 (*6)
Red Hat Enterprise Linux AS4.7/ES4.7 (IPF)	2.6.9-78.EL 2.6.9-78.ELlargesmp	8.02.09-d0 (*3) 8.02.08 (*6) 8.02.23 (*6)

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OS	Kernel	Driver
Red Hat Enterprise Linux AS4.7 (IPF)	2.6.9-78.EL 2.6.9-78.ELlargesmp	8.01.07.15 (*6)
Red Hat Enterprise Linux AS4.7/ES4.7 (EM64T/AMD64)	2.6.9-78.EL 2.6.9-78.ELsmp 2.6.9-78.ELlargesmp	8.02.09-d0 (*3)(*4) 8.02.08 (*6) 8.02.23 (*6)
Red Hat Enterprise Linux AS4.7 (EM64T/AMD64)	2.6.9-78.EL 2.6.9-78.ELsmp 2.6.9-78.ELlargesmp	8.01.07.15 (*6)
Red Hat Enterprise Linux AS4.8/ES4.8 (IA32)	2.6.9-89.EL 2.6.9-89.ELsmp 2.6.9-89.ELhugemem	8.02.09.02.04.08-d (*3)(*4) 8.02.23 (*6) 8.02.09.01.04.09-d (*3)(*4)(*10)
Red Hat Enterprise Linux AS4.8/ES4.8 (IPF)	2.6.9-89.EL 2.6.9-89.ELlargesmp	8.02.09.02.04.08-d (*3) 8.02.23 (*6) 8.02.09.01.04.09-d (*3)(*10)
Red Hat Enterprise Linux AS4.8/ES4.8 (EM64T/AMD64)	2.6.9-89.EL 2.6.9-89.ELsmp 2.6.9-89.ELlargesmp	8.02.09.02.04.08-d (*3)(*4) 8.02.23 (*6) 8.02.09.01.04.09-d (*3)(*4)(*10)
Red Hat Enterprise Linux AS4.9/ES4.9 (IA32)	2.6.9-100.EL 2.6.9-100.ELsmp 2.6.9-100.ELhugemem	8.02.10.01.04.09-d (*3)(*4)
Red Hat Enterprise Linux AS4.9/ES4.9 (IPF)	2.6.9-100.EL 2.6.9-100.ELlargesmp	8.02.10.01.04.09-d (*3)
Red Hat Enterprise Linux AS4.9/ES4.9 (EM64T/AMD64)	2.6.9-100.EL 2.6.9-100.ELsmp 2.6.9-100.ELlargesmp	8.02.10.01.04.09-d (*3)(*4)
Red Hat Enterprise Linux 5 Advanced Platform/Red Hat Enterprise Linux 5 (IA32)	2.6.18-8.el5 2.6.18-8.el5PAE	8.01.07-k1 (*3)(*4)
Red Hat Enterprise Linux 5 Advanced Platform/Red Hat Enterprise Linux 5 (IPF)	2.6.18-8.el5	8.01.07-k1 (*3)
Red Hat Enterprise Linux 5 Advanced Platform/Red Hat Enterprise Linux 5 (EM64T/AMD64)	2.6.18-8.el5	8.01.07-k1 (*3)(*4)
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (IA32)	2.6.18-53.el5 2.6.18-53.el5PAE	8.01.07-k7 (*3)(*4) 8.02.14 (*6)
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (IPF)	2.6.18-53.el5	8.01.07-k7 (*3) 8.02.14 (*6)

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OS	Kernel	Driver
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (EM64T/AMD64)	2.6.18-53.el5	8.01.07-k7 (*3)(*4) 8.02.14 (*6)
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (IA32)	2.6.18-92.el5 2.6.18-92.el5PAE	8.02.00-k5 (*3)(*4) 8.02.14 (*6) 8.02.23 (*6)
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (IPF)	2.6.18-92.el5	8.02.00-k5 (*3) 8.02.14 (*6) 8.02.23 (*6)
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (EM64T/AMD64)	2.6.18-92.el5	8.02.00-k5 (*3)(*4) 8.02.14 (*6) 8.02.23 (*6)
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (IA32)	2.6.18-128.el5 2.6.18-128.el5PAE	8.02.00.06.05.03-k (*3)(*4) 8.02.23 (*6) 8.02.00.51 8.03.01.06 (*4)
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (IPF)	2.6.18-128.el5	8.02.00.06.05.03-k (*3) 8.02.23 (*6)
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (EM64T/AMD64)	2.6.18-128.el5	8.02.00.06.05.03-k (*3)(*4) 8.02.23 (*6) 8.02.00.51 8.03.01.06 (*4)
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (IA32)	2.6.18-164.el5 2.6.18-164.el5PAE	8.03.00.10.05.04-k (*3)(*4) 8.03.00.1.05.05-k (*3)(*4)(*9) 8.03.01.06 (*4) 8.03.03.15.05.06 (*4)
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (IPF)	2.6.18-164.el5	8.03.00.10.05.04-k (*3) 8.03.00.1.05.05-k (*3)(*9)
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (EM64T/AMD64)	2.6.18-164.el5	8.03.00.10.05.04-k (*3)(*4) 8.03.00.1.05.05-k (*3)(*4)(*9) 8.03.01.06 (*4) 8.03.03.15.05.06 (*4)

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OS	Kernel	Driver
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (IA32)	2.6.18-194.el5 2.6.18-194.el5PAE	8.03.01.04.05.05-k (*3)(*4) 8.03.01.06 (*4) 8.03.03.15.05.06 (*4) 8.03.07.03.5.6-k 8.03.07.05.5.6-k-sw1
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (IPF)	2.6.18-194.el5	8.03.01.04.05.05-k (*3)
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (EM64T/AMD64)	2.6.18-194.el5	8.03.01.04.05.05-k (*3)(*4) 8.03.01.06 (*4) 8.03.03.15.05.06 (*4) 8.03.07.03.5.6-k 8.03.07.05.5.6-k-sw1
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (IA32)	2.6.18-238.el5 2.6.18-238.el5PAE	8.03.01.05.05.06-k (*3)(*4) 8.03.07.03.5.6-k
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (IPF)	2.6.18-238.el5	8.03.01.05.05.06-k (*3)
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (EM64T/AMD64)	2.6.18-238.el5	8.03.01.05.05.06-k (*3)(*4) 8.03.07.03.5.6-k
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (IA32)	2.6.18-274.el5 2.6.18-274.el5PAE	8.03.07.03.05.07-k (*3)(*4)
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (IPF)	2.6.18-274.el5	8.03.07.03.05.07-k (*3)
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (EM64T/AMD64)	2.6.18-274.el5	8.03.07.03.05.07-k (*3)(*4) 8.2.0.33.3p-1.6.1-MCL
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (IA32)	2.6.18-308.el5 2.6.18-308.el5PAE	8.03.07.09.05.08-k (*3)(*4) 8.06.00.11.5.6-k
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (IPF)	2.6.18-308.el5	8.03.07.09.05.08-k (*3)
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (EM64T/AMD64)	2.6.18-308.el5	8.03.07.09.05.08-k (*3)(*4) 8.06.00.11.5.6-k

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OS	Kernel	Driver
Red Hat Enterprise Linux 5.9 Advanced Platform/Red Hat Enterprise Linux 5.9 (IA32)	2.6.18-348.el5 2.6.18-348.el5PAE	8.03.07.15.05.09-k (*3)(*4) 8.06.00.11.5.6-k
Red Hat Enterprise Linux 5.9 Advanced Platform/Red Hat Enterprise Linux 5.9 (IPF)	2.6.18-348.el5	8.03.07.15.05.09-k (*3)
Red Hat Enterprise Linux 5.9 Advanced Platform/Red Hat Enterprise Linux 5.9 (EM64T/AMD64)	2.6.18-348.el5	8.03.07.15.05.09-k (*3)(*4) 8.06.00.11.5.6-k
Red Hat Enterprise Linux 5.10 Advanced Platform/Red Hat Enterprise Linux 5.10 (IA32)	2.6.18-371.el5 2.6.18-371.el5PAE	8.03.07.15.05.09-k (*3)(*4) 8.06.00.11.5.6-k
Red Hat Enterprise Linux 5.10 Advanced Platform/Red Hat Enterprise Linux 5.10 (IPF)	2.6.18-371.el5	8.03.07.15.05.09-k (*3)
Red Hat Enterprise Linux 5.10 Advanced Platform/Red Hat Enterprise Linux 5.10 (EM64T/AMD64)	2.6.18-371.el5	8.03.07.15.05.09-k (*3)(*4) 8.06.00.11.5.6-k
Red Hat Enterprise Linux 5.11 Advanced Platform/Red Hat Enterprise Linux 5.11 (IA32)	2.6.18-398.el5 2.6.18-398.el5PAE	8.03.07.15.05.09-k (*3)(*4)
Red Hat Enterprise Linux 5.11 Advanced Platform/Red Hat Enterprise Linux 5.11 (IPF)	2.6.18-398.el5	8.03.07.15.05.09-k (*3)
Red Hat Enterprise Linux 5.11 Advanced Platform/Red Hat Enterprise Linux 5.11 (EM64T/AMD64)	2.6.18-398.el5	8.03.07.15.05.09-k (*3)(*4)
Red Hat Enterprise Linux 6 (IA32)	2.6.32-71.el6.i686	8.03.01.05.06.0-k8 (*3)(*4)
Red Hat Enterprise Linux 6 (EM64T/AMD64)	2.6.32-71.el6.x86_64	8.03.01.05.06.0-k8 (*3)(*4)
Red Hat Enterprise Linux 6.1 (IA32)	2.6.32-131.0.15.el6.i686	8.03.07.03.06.1-k (*3)(*4) 8.03.07.13.06.0-k
Red Hat Enterprise Linux 6.1 (EM64T/AMD64)	2.6.32-131.0.15.el6.x86_64	8.03.07.03.06.1-k (*3)(*4) 8.03.07.13.06.0-k

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OS	Kernel	Driver
Red Hat Enterprise Linux 6.2 (IA32)	2.6.32-220.el6.i686	8.03.07.05.06.2-k (*3)(*4) 8.03.07.13.06.0-k 8.04.00.06.06.0-k 8.06.00.10.06.0-k
Red Hat Enterprise Linux 6.2 (EM64T/AMD64)	2.6.32-220.el6.x86_64	8.03.07.05.06.2-k (*3)(*4) 8.03.07.13.06.0-k 8.04.00.06.06.0-k 8.06.00.10.06.0-k
Red Hat Enterprise Linux 6.3 (IA32)	2.6.32-279.el6.i686	8.04.00.04.06.3-k (*3)(*4) 8.05.00.03.06.0-k 8.06.00.10.06.0-k
Red Hat Enterprise Linux 6.3 (EM64T/AMD64)	2.6.32-279.el6.x86_64	8.04.00.04.06.3-k (*3)(*4) 8.05.00.03.06.0-k 8.06.00.10.06.0-k
Red Hat Enterprise Linux 6.4 (IA32)	2.6.32-358.el6.i686	8.04.00.08.06.4-k (*3)(*4) 8.05.00.03.06.0-k 8.06.00.10.06.0-k
Red Hat Enterprise Linux 6.4 (EM64T/AMD64)	2.6.32-358.el6.x86_64	8.04.00.08.06.4-k (*3)(*4) 8.05.00.03.06.0-k 8.06.00.10.06.0-k
Red Hat Enterprise Linux 6.5 (IA32)	2.6.32-431.el6.i686	8.05.00.03.06.5-k2 (*3)(*4)
Red Hat Enterprise Linux 6.5 (EM64T/AMD64)	2.6.32-431.el6.x86_64	8.05.00.03.06.5-k2 (*3)(*4)
Red Hat Enterprise Linux 6.6 (IA32)	2.6.32-504.el6.i686	8.07.00.08.06.6-k1 (*3)(*4)
Red Hat Enterprise Linux 6.6 (EM64T/AMD64)	2.6.32-504.el6.x86_64	8.07.00.08.06.6-k1 (*3)(*4)
Red Hat Enterprise Linux 7 (EM64T/AMD64)	3.10.0-123.el7.x86_64	8.06.00.08.07.0-k (*3)
SUSE LINUX Enterprise Server 10 (IA32)	2.6.16.21-0.8-default 2.6.16.21-0.8-smp 2.6.16.21-0.8-bigsm	8.01.04-k (*3)
	2.6.16.46-0.14-default 2.6.16.46-0.14-smp 2.6.16.46-0.14-bigsm	8.01.07-k3 (*3)(*4) 8.02.14 (*6)
	2.6.16.60-0.21-default 2.6.16.60-0.21-smp 2.6.16.60-0.21-bigsm	8.02.00-k6 (*3)(*4) 8.02.14 (*6)
	2.6.16.60-0.21-xenpae	8.02.00-k6 (*3)(*4)

Appendix A

OS	Kernel	Driver
	2.6.16.60-0.54.5-default 2.6.16.60-0.54.5-smp 2.6.16.60-0.54.5-bigsmp	8.03.00.10.10.3-k4 (*3)(*4)
	2.6.16.60-0.54.5-xenpae	8.03.00.10.10.3-k4 (*3)(*4)
	2.6.16.60-0.85.1-default 2.6.16.60-0.85.1-smp 2.6.16.60-0.85.1-bigsmp	8.03.01.12.10.3-k4 (*3)(*4)
	2.6.16.60-0.85.1-xenpae	8.03.01.12.10.3-k4 (*3)(*4)
SUSE LINUX Enterprise Server 10 (IPF)	2.6.16.21-0.8-default	8.01.04-k (*3)
	2.6.16.46-0.14-default	8.01.07-k3 (*3) 8.02.14 (*6)
	2.6.16.60-0.21-default	8.02.00-k6 (*3) 8.02.14 (*6)
	2.6.16.60-0.54.5-default	8.03.00.10.10.3-k4 (*3)
	2.6.16.60-0.85.1-default	8.03.01.12.10.3-k4 (*3)
SUSE LINUX Enterprise Server 10 (EM64T/AMD64)	2.6.16.21-0.8-default 2.6.16.21-0.8-smp	8.01.04-k (*3)
	2.6.16.46-0.14-default 2.6.16.46-0.14-smp	8.01.07-k3 (*3)(*4) 8.02.14 (*6)
	2.6.16.60-0.21-default 2.6.16.60-0.21-smp	8.02.00-k6 (*3)(*4) 8.02.14 (*6)
	2.6.16.60-0.21-xen	8.02.00-k6 (*3)(*4)
	2.6.16.60-0.54.5-default 2.6.16.60-0.54.5-smp	8.03.00.10.10.3-k4 (*3)(*4)
	2.6.16.60-0.54.5-xen	8.03.00.10.10.3-k4 (*3)(*4)
	2.6.16.60-0.85.1-default 2.6.16.60-0.85.1-smp	8.03.01.12.10.3-k4 (*3)(*4)
	2.6.16.60-0.85.1-xen	8.03.01.12.10.3-k4 (*3)(*4)
SUSE LINUX Enterprise Server 11 (IA32)	2.6.27.21-0.1.2-default 2.6.27.21-0.1.2-pae	8.02.01.03.11.0-k9(*3)(*4)
	2.6.27.21-0.1.2-xen	8.02.01.03.11.0-k9 (*3)(*4)
	2.6.32.12-0.7.1-default	8.03.01.06.11.1-k8 (*3)(*4)
	2.6.32.12-0.7.1-pae	8.03.01.08.11.1-k8 (*3)(*4)(*9)
		8.03.07.13.11.1-k

Appendix A

OS	Kernel	Driver
		8.03.04.14.11.1-k0 (*4)
	2.6.32.12-0.7.1-xen	8.03.01.06.11.1-k8 (*3)(*4)
		8.03.01.08.11.1-k8 (*3)(*4)(*9)
		8.03.07.13.11.1-k
		8.03.04.14.11.1-k0 (*4)
	3.0.13-0.27-default 3.0.13-0.27-pae	8.03.07.07-k (*3)(*4)
	3.0.76-0.11-default 3.0.76-0.11-pae	8.04.00.13.11.3-k (*3)(*4)
SUSE LINUX Enterprise Server 11 (IPF)	2.6.27.21-0.1.2-default	8.02.01.03.11.0-k9 (*3)
	2.6.32.12-0.7.1-default	8.03.01.06.11.1-k8 (*3)
		8.03.01.08.11.1-k8 (*3)(*9)
	3.0.13-0.27-default	8.03.07.07-k (*3)
3.0.76-0.11-default	8.04.00.13.11.3-k (*3)	
SUSE LINUX Enterprise Server 11 (EM64T/AMD64)	2.6.27.21-0.1.2-default	8.02.01.03.11.0-k9 (*3)(*4)
	2.6.27.21-0.1.2-xen	8.02.01.03.11.0-k9 (*3)(*4)
	2.6.32.12-0.7.1-default	8.03.01.06.11.1-k8 (*3)(*4)
		8.03.01.08.11.1-k8 (*3)(*4)(*9)
		8.03.07.13.11.1-k
		8.03.04.14.11.1-k0 (*4)
	2.6.32.12-0.7.1-xen	8.03.01.06.11.1-k8 (*3)(*4)
		8.03.01.08.11.1-k8 (*3)(*4)(*9)
		8.03.07.13.11.1-k
		8.03.04.14.11.1-k0 (*4)
	3.0.13-0.27-default	8.03.07.07-k (*3)(*4)
	3.0.76-0.11-default	8.04.00.13.11.3-k (*3)(*4)
	3.0.76-0.11-xen	8.04.00.13.11.3-k (*3)(*4)
Oracle Enterprise Linux 4 (IA32)	2.6.9-55.0.0.0.2.EL 2.6.9-55.0.0.0.2.ELsmp	8.01.04-d8 (*3)(*4)
	2.6.9-55.0.0.0.2.ELhugemem	8.02.23
	2.6.9-67.0.0.0.1.EL 2.6.9-67.0.0.0.1.ELsmp 2.6.9-67.0.0.0.1.ELhugemem	8.01.07-d4 (*3)(*4)
Oracle Enterprise Linux 4 (EM64T/AMD64)	2.6.9-55.0.0.0.2.EL 2.6.9-55.0.0.0.2.ELsmp	8.01.04-d8 (*3)(*4)
	2.6.9-55.0.0.0.2.ELlargesmp	8.02.23

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OS	Kernel	Driver
	2.6.9-67.0.0.0.1.EL 2.6.9-67.0.0.0.1.ELsmp 2.6.9-67.0.0.0.1.ELlargesmp	8.01.07-d4 (*3)(*4)
Oracle Enterprise Linux 5 (IA32)	2.6.18-53.el5 2.6.18-53.el5PAE	8.01.07-k7 (*3)(*4)
Oracle Enterprise Linux 5 (EM64T/AMD64)	2.6.18-53.el5	8.01.07-k7 (*3)(*4)
Oracle Enterprise Linux 5.4 (IA32)	2.6.18-164.el5 2.6.18-164.el5PAE	8.03.00.10.05.04-k (*3)(*4)
Oracle Enterprise Linux 5.4 (EM64T/AMD64)	2.6.18-164.el5	8.03.00.10.05.04-k (*3)(*4)
Oracle Enterprise Linux 5.5 (IA32)	2.6.18-194.el5 2.6.18-194.el5PAE	8.03.01.04.05.05-k (*3)(*4)
Oracle Enterprise Linux 5.5 (EM64T/AMD64)	2.6.18-194.el5	8.03.01.04.05.05-k (*3)(*4)
Oracle Enterprise Linux 5.6 (IA32)	2.6.18-238.el5 2.6.18-238.el5PAE	8.03.01.05.05.06-k (*3)(*4)
Oracle Enterprise Linux 5.6 (EM64T/AMD64)	2.6.18-238.el5	8.03.01.05.05.06-k (*3)(*4)
Oracle Enterprise Linux 5.7 (IA32)	2.6.18-274.el5 2.6.18-274.el5PAE	8.03.07.03.05.07-k (*3)(*4)
Oracle Enterprise Linux 5.7 (EM64T/AMD64)	2.6.18-274.el5	8.03.07.03.05.07-k (*3)(*4)
Oracle Linux 7 (EM64T/AMD64)	3.10.0-123.el7.x86_64	8.06.00.08.07.0-k (*3)
Oracle Unbreakable Enterprise Kernel 5.6 (EM64T/AMD64)	2.6.32-100.26.2.el5	8.03.01.02.32.1-k9 (*3)(*4)
Oracle Unbreakable Enterprise Kernel 5.7 (IA32)	2.6.32-200.13.1.el5uek	8.03.07.04.32.1-k (*3)(*4)
	2.6.32-300.27.1.el5uek	8.03.07.08.32.1-k (*3)(*4)
Oracle Unbreakable Enterprise Kernel 5.7 (EM64T/AMD64)	2.6.32-200.13.1.el5uek	8.03.07.04.32.1-k (*3)(*4)
	2.6.32-300.27.1.el5uek	8.03.07.08.32.1-k (*3)(*4)
Oracle Unbreakable Enterprise Kernel 5.8 (IA32)	2.6.32-300.39.2.el5uek	8.03.07.08.32.1-k (*3)(*4)

Appendix A

OS	Kernel	Driver
Oracle Unbreakable Enterprise Kernel 5.8 (EM64T/AMD64)	2.6.32-300.39.2.el5uek	8.03.07.08.32.1-k (*3)(*4)
Oracle Unbreakable Enterprise Kernel 6.2 (IA32)	2.6.39-200.29.1.el6uek.686	8.04.00.03.39.0-k (*3)(*4)
	2.6.39-200.29.2.el6uek.686	8.04.00.03.39.0-k (*3)(*4)
Oracle Unbreakable Enterprise Kernel 6.2 (EM64T/AMD64)	2.6.39-200.29.1.el6uek.x86_64	8.04.00.03.39.0-k (*3)(*4)
	2.6.39-200.29.2.el6uek.x86_64	8.04.00.03.39.0-k (*3)(*4)
Oracle Unbreakable Enterprise Kernel 6.3 (IA32)	2.6.39-200.24.1.el6uek.686	8.04.00.03.39.0-k (*3)(*4)
Oracle Unbreakable Enterprise Kernel 6.3 (EM64T/AMD64)	2.6.39-200.24.1.el6uek.x86_64	8.04.00.03.39.0-k (*3)(*4)
Oracle Unbreakable Enterprise Kernel 6.4 (IA32)	2.6.39-400.211.1.el6uek.686	8.05.00.03.39.0-k (*3)(*4)
Oracle Unbreakable Enterprise Kernel 6.4 (EM64T/AMD64)	2.6.39-400.211.1.el6uek.x86_64	8.05.00.03.39.0-k (*3)(*4)
Oracle Unbreakable Enterprise Kernel 6.5 (IA32)	2.6.39-400.211.1.el6uek.686	8.05.00.03.39.0-k (*3)(*4)
Oracle Unbreakable Enterprise Kernel 6.5 (EM64T/AMD64)	3.8.13-16.2.1.el6uek.x86_64	8.05.00.03.39.0-k (*3)(*4)
Oracle Unbreakable Enterprise Kernel 7 (EM64T/AMD64)	3.8.13-44.el7uek.x86_64	8.07.00.08.39.0-k1 (*3)

Note:

*1: Do not use the HBA driver's failover function.

Check the setting for the failover function by performing the following procedure:

- For Red Hat Enterprise Linux AS4/ES4, Red Hat Enterprise Linux AS4.5/ES4.5, Red Hat Enterprise Linux AS4.6/ES4.6, Red Hat Enterprise Linux AS4.7/ES4.7, Red Hat Enterprise Linux AS4.8/ES4.8, Red Hat Enterprise Linux AS4.9/ES4.9, and Oracle Enterprise Linux 4:

1) Execute the following command to check the version of the driver:

```
# grep version /proc/scsi/driver-name/adaptor-id
```

driver-name: qlaxxxx (name of the driver currently being used)

adapter-id: Host port number

2) Check the output result to see whether the characters "fo" are added to the version notation.

- When the failover function is enabled:

Firmware version: 2.02.06, Driver version 7.00.03-fo

- When the failover function is disabled:

Firmware version: 2.02.06, Driver version 7.00.03

- For Red Hat Enterprise Linux 5 Advanced Platform, Red Hat Enterprise Linux 5, Red Hat Enterprise Linux 5.1 Advanced Platform, Red Hat Enterprise Linux 5.1, Red Hat Enterprise Linux 5.2 Advanced Platform, Red Hat Enterprise Linux 5.2, Red Hat Enterprise Linux 5.3 Advanced Platform, Red Hat Enterprise Linux 5.3, Red Hat Enterprise Linux 5.4 Advanced Platform, Red Hat Enterprise Linux 5.4, Red Hat Enterprise Linux 5.5 Advanced Platform, Red Hat Enterprise Linux 5.5, Red Hat Enterprise Linux 5.6 Advanced Platform, Red Hat Enterprise Linux 5.6, Red Hat Enterprise Linux 5.7 Advanced Platform, Red Hat Enterprise Linux 5.7, Red Hat Enterprise Linux 5.8 Advanced Platform, Red Hat Enterprise Linux 5.8, Red Hat Enterprise Linux 5.9 Advanced Platform, Red Hat Enterprise Linux 5.9, Red Hat Enterprise Linux 5.10 Advanced Platform, Red Hat Enterprise Linux 5.10, Red Hat Enterprise Linux 5.11 Advanced Platform, Red Hat Enterprise Linux 5.11, Red Hat Enterprise Linux 6, Red Hat Enterprise Linux 6.1, Red Hat Enterprise Linux 6.2, Red Hat Enterprise Linux 6.3, Red Hat Enterprise Linux 6.4, Red Hat Enterprise Linux 6.5, Red Hat Enterprise Linux 6.6, Red Hat Enterprise Linux 7, Oracle Enterprise Linux 5, Oracle Enterprise Linux 5.4, Oracle Enterprise Linux 5.5, Oracle Enterprise Linux 5.6, Oracle Unbreakable Enterprise Kernel 5.6, Oracle Unbreakable Enterprise Kernel 5.7, Oracle Unbreakable Enterprise Kernel 5.8, Oracle Unbreakable Enterprise Kernel 6.2, Oracle Unbreakable Enterprise Kernel 6.3, Oracle Unbreakable Enterprise Kernel 6.4, Oracle Unbreakable Enterprise Kernel 6.5, Oracle Unbreakable Enterprise Kernel 7, SUSE LINUX Enterprise Server 10, and SUSE LINUX Enterprise Server 11

1) Execute the following command to check the version of the driver:

```
# cat /sys/class/scsi_host/hostn/driver_version
```

n: the instance number of the HBA port

2) Check the output result to see whether the characters "fo" are added to the version notation.

- When the failover function is enabled:

8.01.07-k1-fo

- When the failover function is disabled:

8.01.07-k1

*2: The drivers mentioned in the page of "Hitachi Data Systems - HBA Approved Software" in the QLogic website are supported. Get the drivers from the following URL:

http://support.qlogic.com/support/oem_detail_hds.asp?oemid=84&classid=237

The above-mentioned URL may be changed without notice. When the URL is changed, look for the page of "Hitachi Data Systems - HBA Approved Software" in the QLogic website.

- *3: Use the driver bundled with the kernel.
- *4: Using an HDLM device as the boot disk is supported.
- *5: HDLM also supports the environments in which 32-bit kernel packages are installed on a system using an AMD Opteron processor.
- *6: Since the failover function is Enable by default, change it to Disable. For changing the setting of the failover function to Disable, set the following in /etc/modprobe.conf file.

Example: When the driver version is 8.01.01.

```
options qla2xxx ql2xfailover=0
```

Refer to the document of the HBA attachment for details of the setting change of the failover function.

- *7: EM64T indicates the environments in which 64-bit kernel packages are installed on a system using an Intel EM64T processor.
- *8: AMD64 indicates the environments in which 64-bit kernel packages are installed on a system using an AMD Opteron processor.
- *9: Supported by Kernel 2.6.32.24-0.2.1 or later.
- *10: Supported by Kernel 2.6.9-89.0.25 or later.

(2) Emulex

OS	Kernel	Driver
Red Hat Enterprise Linux AS4/ES4 (IA32)	2.6.9-34.EL	8.0.16.27
	2.6.9-34.ELsmp	
	2.6.9-34.ELhugemem	8.0.16.32
	2.6.9-34.0.2.EL	8.0.16.27
	2.6.9-34.0.2.ELsmp	8.0.16.32
	2.6.9-34.0.2.ELhugemem	
	2.6.9-42.EL	8.0.16.27 (*2)
	2.6.9-42.ELhugemem	8.0.16.32
	2.6.9-42.ELsmp (*4)	
	2.6.9-42.0.3.EL	8.0.16.27 (*2)
2.6.9-42.0.3.ELsmp	8.0.16.32	
2.6.9-42.0.3.ELhugemem		
Red Hat Enterprise Linux AS4/ES4 (IPF)	2.6.9-34.EL	8.0.16.27
	2.6.9-42.EL	8.0.16.27 (*2)

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OS	Kernel	Driver
	2.6.9-42.0.3.EL	8.0.16.27 (*2)
Red Hat Enterprise Linux AS4/ES4 (EM64T/AMD64)	2.6.9-34.EL 2.6.9-34.ELsmp 2.6.9-34.ELlargesmp	8.0.16.27 8.0.16.32
	2.6.9-34.0.2.EL 2.6.9-34.0.2.ELsmp 2.6.9-34.0.2.ELlargesmp	8.0.16.27 8.0.16.32
	2.6.9-42.EL 2.6.9-42.ELsmp 2.6.9-42.ELlargesmp	8.0.16.27 (*2) 8.0.16.32
	2.6.9-42.0.3.EL 2.6.9-42.0.3.ELsmp 2.6.9-42.0.3.ELlargesmp	8.0.16.27 (*2) 8.0.16.32
Red Hat Enterprise Linux AS4.5/ES4.5 (IA32)	2.6.9-55.EL 2.6.9-55.ELsmp 2.6.9-55.ELhugemem	8.0.16.27 (*2)(*3) 8.0.16.32 8.0.16.32 (*6)
Red Hat Enterprise Linux AS4.5 (IA32)	2.6.9-55.EL 2.6.9-55.ELsmp 2.6.9-55.ELhugemem	8.0.16.40
Red Hat Enterprise Linux AS4.5/ES4.5 (IPF)	2.6.9-55.EL 2.6.9-55.ELlargesmp	8.0.16.27 (*2)(*3) 8.0.16.32 (*6)
Red Hat Enterprise Linux AS4.5 (IPF)	2.6.9-55.EL 2.6.9-55.ELlargesmp	8.0.16.40
Red Hat Enterprise Linux AS4.5/ES4.5 (EM64T/AMD64)	2.6.9-55.EL 2.6.9-55.ELsmp 2.6.9-55.ELlargesmp	8.0.16.27 (*2)(*3) 8.0.16.32 8.0.16.32 (*6)
Red Hat Enterprise Linux AS4.5 (EM64T/AMD64)	2.6.9-55.EL 2.6.9-55.ELsmp 2.6.9-55.ELlargesmp	8.0.16.40
Red Hat Enterprise Linux AS4.6/ES4.6 (IA32)	2.6.9-67.EL 2.6.9-67.ELsmp 2.6.9-67.ELhugemem	8.0.16.34 (*2)(*3)
Red Hat Enterprise Linux AS4.6 (IA32)	2.6.9-67.EL 2.6.9-67.ELsmp 2.6.9-67.ELhugemem	8.0.16.40

Appendix A

OS	Kernel	Driver
Red Hat Enterprise Linux AS4.6/ES4.6 (IPF)	2.6.9-67.EL 2.6.9-67.ELlargesmp	8.0.16.34 (*2)(*3)
Red Hat Enterprise Linux AS4.6 (IPF)	2.6.9-67.EL 2.6.9-67.ELlargesmp	8.0.16.40
Red Hat Enterprise Linux AS4.6/ES4.6 (EM64T/AMD64)	2.6.9-67.EL 2.6.9-67.ELsmp 2.6.9-67.ELlargesmp	8.0.16.34 (*2)(*3)
Red Hat Enterprise Linux AS4.6 (EM64T/AMD64)	2.6.9-67.EL 2.6.9-67.ELsmp 2.6.9-67.ELlargesmp	8.0.16.40
Red Hat Enterprise Linux AS4.7/ES4.7 (IA32)	2.6.9-78.EL 2.6.9-78.ELsmp 2.6.9-78.ELhugemem	8.0.16.40 (*2)(*3) 8.0.16.47
Red Hat Enterprise Linux AS4.7/ES4.7 (IPF)	2.6.9-78.EL 2.6.9-78.ELlargesmp	8.0.16.40 (*2)(*3) 8.0.16.47
Red Hat Enterprise Linux AS4.7/ES4.7 (EM64T/AMD64)	2.6.9-78.EL 2.6.9-78.ELsmp 2.6.9-78.ELlargesmp	8.0.16.40 (*2)(*3) 8.0.16.47
Red Hat Enterprise Linux AS4.8/ES4.8 (IA32)	2.6.9-89.EL 2.6.9-89.ELsmp 2.6.9-89.ELhugemem	8.0.16.40 8.0.16.46 (*2)(*3) 8.0.16.47 (*2)(*3)(*9)
Red Hat Enterprise Linux AS4.8/ES4.8 (IPF)	2.6.9-89.EL 2.6.9-89.ELlargesmp	8.0.16.40 8.0.16.46 (*2)(*3) 8.0.16.47 (*2)(*3)(*9)
Red Hat Enterprise Linux AS4.8/ES4.8 (EM64T/AMD64)	2.6.9-89.EL 2.6.9-89.ELsmp 2.6.9-89.ELlargesmp	8.0.16.40 8.0.16.46 (*2)(*3) 8.0.16.47(*2)(*3)(*9)
Red Hat Enterprise Linux AS4.9/ES4.9 (IA32)	2.6.9-100.EL 2.6.9-100.ELsmp 2.6.9-100.ELhugemem	8.0.16.40 8.0.16.47 (*2)(*3)
Red Hat Enterprise Linux AS4.9/ES4.9 (IPF)	2.6.9-100.EL 2.6.9-100.ELlargesmp	8.0.16.40 8.0.16.47 (*2)(*3)
Red Hat Enterprise Linux AS4.9/ES4.9 (EM64T/AMD64)	2.6.9-100.EL 2.6.9-100.ELsmp 2.6.9-100.ELlargesmp	8.0.16.40 8.0.16.47 (*2)(*3)
Red Hat Enterprise Linux 5 Advanced Platform/Red Hat	2.6.18-8.el5 2.6.18-8.el5PAE	8.1.10.3 (*2)(*3) 8.1.10.12

Appendix A

OS	Kernel	Driver
Enterprise Linux 5 (IA32)		8.2.0.22 8.2.0.29 8.2.0.33.3p
Red Hat Enterprise Linux 5 Advanced Platform/Red Hat Enterprise Linux 5 (IPF)	2.6.18-8.el5	8.1.10.3 (*2)(*3) 8.1.10.12 8.2.0.22 8.2.0.29 8.2.0.33.3p
Red Hat Enterprise Linux 5 Advanced Platform/Red Hat Enterprise Linux 5 (EM64T/AMD64)	2.6.18-8.el5	8.1.10.3 (*2)(*3) 8.1.10.12 8.2.0.22 8.2.0.29 8.2.0.33.3p
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (IA32)	2.6.18-53.el5 2.6.18-53.el5PAE	8.1.10.9 (*2)(*3) 8.1.10.12 (*7) 8.2.0.22 8.2.0.29 8.2.0.33.3p
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (IPF)	2.6.18-53.el5	8.1.10.9 (*2)(*3) 8.1.10.12 (*7) 8.2.0.22 8.2.0.29 8.2.0.33.3p
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (EM64T/AMD64)	2.6.18-53.el5	8.1.10.9 (*2)(*3) 8.1.10.12 (*7) 8.2.0.22 8.2.0.29 8.2.0.33.3p
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (IA32)	2.6.18-92.el5 2.6.18-92.el5PAE	8.2.0.22 (*2)(*3) 8.2.0.29 8.2.0.33.3p
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (IPF)	2.6.18-92.el5	8.2.0.22 (*2)(*3) 8.2.0.29 8.2.0.33.3p

Appendix A

OS	Kernel	Driver
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (EM64T/AMD64)	2.6.18-92.el5	8.2.0.22 (*2)(*3) 8.2.0.29 8.2.0.33.3p
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (IA32)	2.6.18-128.el5 2.6.18-128.el5PAE	8.2.0.33.3p (*2)(*3)
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (IPF)	2.6.18-128.el5	8.2.0.33.3p (*2)(*3)
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (EM64T/AMD64)	2.6.18-128.el5	8.2.0.33.3p (*2)(*3)
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (IA32)	2.6.18-164.el5 2.6.18-164.el5PAE	8.2.0.48.2p (*2)(*3) 8.2.0.48.3p (*2)(*3)(*8)
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (IPF)	2.6.18-164.el5	8.2.0.48.2p (*2)(*3) 8.2.0.48.3p (*2)(*3)(*8)
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (EM64T/AMD64)	2.6.18-164.el5	8.2.0.48.2p (*2)(*3) 8.2.0.48.3p (*2)(*3)(*8)
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (IA32)	2.6.18-194.el5 2.6.18-194.el5PAE	8.2.0.63.3p (*2)(*3)
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (IPF)	2.6.18-194.el5	8.2.0.63.3p (*2)(*3)
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (EM64T/AMD64)	2.6.18-194.el5	8.2.0.63.3p (*2)(*3)
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (IA32)	2.6.18-238.el5 2.6.18-238.el5PAE	8.2.0.87.1p (*2)(*3)
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (IPF)	2.6.18-238.el5	8.2.0.87.1p (*2)(*3)

Appendix A

OS	Kernel	Driver
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (EM64T/AMD64)	2.6.18-238.el5	8.2.0.87.1p (*2)(*3)
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (IA32)	2.6.18-274.el5 2.6.18-274.el5PAE	8.2.0.96.2p (*2)(*3)
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (IPF)	2.6.18-274.el5	8.2.0.96.2p (*2)(*3)
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (EM64T/AMD64)	2.6.18-274.el5	8.2.0.96.2p (*2)(*3)
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (IA32)	2.6.18-308.el5 2.6.18-308.el5PAE	8.2.0.108.4p (*2)(*3)
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (IPF)	2.6.18-3084.el5	8.2.0.108.4p (*2)(*3)
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (EM64T/AMD64)	2.6.18-308.el5	8.2.0.108.4p (*2)(*3)
Red Hat Enterprise Linux 5.9 Advanced Platform/Red Hat Enterprise Linux 5.9 (IA32)	2.6.18-348.el5 2.6.18-348.el5PAE	8.2.0.128.3p (*2)(*3)
Red Hat Enterprise Linux 5.9 Advanced Platform/Red Hat Enterprise Linux 5.9 (IPF)	2.6.18-348.el5	8.2.0.128.3p (*2)(*3)
Red Hat Enterprise Linux 5.9 Advanced Platform/Red Hat Enterprise Linux 5.9 (EM64T/AMD64)	2.6.18-348.el5	8.2.0.128.3p (*2)(*3)
Red Hat Enterprise Linux 5.10 Advanced Platform/Red Hat Enterprise Linux 5.10 (IA32)	2.6.18-371.el5 2.6.18-371.el5PAE	8.2.0.128.3p (*2)(*3)
Red Hat Enterprise Linux 5.10 Advanced Platform/Red Hat Enterprise Linux 5.10 (IPF)	2.6.18-371.el5	8.2.0.128.3p (*2)(*3)

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OS	Kernel	Driver
Red Hat Enterprise Linux 5.10 Advanced Platform/Red Hat Enterprise Linux 5.10 (EM64T/AMD64)	2.6.18-371.el5	8.2.0.128.3p (*2)(*3)
Red Hat Enterprise Linux 5.11 Advanced Platform/Red Hat Enterprise Linux 5.11 (IA32)	2.6.18-398.el5 2.6.18-398.el5PAE	8.2.0.128.3p (*2)(*3)
Red Hat Enterprise Linux 5.11 Advanced Platform/Red Hat Enterprise Linux 5.11 (IPF)	2.6.18-398.el5	8.2.0.128.3p (*2)(*3)
Red Hat Enterprise Linux 5.11 Advanced Platform/Red Hat Enterprise Linux 5.11 (EM64T/AMD64)	2.6.18-398.el5	8.2.0.128.3p (*2)(*3)
Red Hat Enterprise Linux 6 (IA32)	2.6.32-71.el6.i686	8.3.5.17 (*2)(*3)
Red Hat Enterprise Linux 6 (EM64T/AMD64)	2.6.32-71.el6.x86_64	8.3.5.17 (*2)(*3)
Red Hat Enterprise Linux 6.1 (IA32)	2.6.32-131.0.15.el6.i686	8.3.5.30.1p (*2)(*3)
Red Hat Enterprise Linux 6.1 (EM64T/AMD64)	2.6.32-131.0.15.el6.x86_64	8.3.5.30.1p (*2)(*3) 8.3.7.18-1
Red Hat Enterprise Linux 6.2 (IA32)	2.6.32-220.el6.i686	8.3.5.45.4p (*2)(*3)
Red Hat Enterprise Linux 6.2(EM64T/AMD64)	2.6.32-220.el6.x86_64	8.3.5.45.4p (*2)(*3) 8.3.7.18-1
Red Hat Enterprise Linux 6.3 (IA32)	2.6.32-279.el6.i686	8.3.5.68.5p (*2)(*3)
Red Hat Enterprise Linux 6.3(EM64T/AMD64)	2.6.32-279.el6.x86_64	8.3.5.68.5p (*2)(*3) 8.3.7.18-1
Red Hat Enterprise Linux 6.4 (IA32)	2.6.32-358.el6.i686	8.3.5.86.1p (*2)(*3)
Red Hat Enterprise Linux 6.4(EM64T/AMD64)	2.6.32-358.el6.x86_64	8.3.5.86.1p (*2)(*3) 8.3.7.18-1
Red Hat Enterprise Linux 6.5 (IA32)	2.6.32-431.el6.i686	8.3.7.21.4p (*2)(*3)
Red Hat Enterprise Linux 6.5(EM64T/AMD64)	2.6.32-431.el6.x86_64	8.3.7.21.4p (*2)(*3) 8.3.7.39
Red Hat Enterprise Linux 6.6 (IA32)	2.6.32-504.el6.i686	10.2.802.1 (*2)(*3)
Red Hat Enterprise Linux 6.6(EM64T/AMD64)	2.6.32-504.el6.x86_64	10.2.802.1 (*2)(*3)

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OS	Kernel	Driver
Red Hat Enterprise Linux 7 (EM64T/AMD64)	3.10.0-123.el6.x86_64	8.3.7.31.1p (*2)(*3)
SUSE LINUX Enterprise Server 10 (IA32)	2.6.16.21-0.8-default	8.1.6 (*2)
	2.6.16.21-0.8-smp	8.1.6.6
	2.6.16.21-0.8-bigsmp	
	2.6.16.46-0.14-default	8.1.10.3 (*2)
	2.6.16.46-0.14-smp	8.1.10.12
	2.6.16.46-0.14-bigsmp	8.2.0.22
	2.6.16.60-0.21-default	8.2.0.22 (*2)
	2.6.16.60-0.21-smp	
	2.6.16.60-0.21-bigsmp	
SUSE LINUX Enterprise Server 10 (IPF)	2.6.16.21-0.8-default	8.1.6 (*2)
	2.6.16.21-0.8-smp	8.1.6.6
	2.6.16.21-0.8-bigsmp	
	2.6.16.46-0.14-default	8.1.10.3 (*2)
	2.6.16.46-0.14-smp	8.1.10.12
	2.6.16.46-0.14-bigsmp	8.2.0.22
	2.6.16.60-0.21-default	8.2.0.22 (*2)
	2.6.16.60-0.21-smp	
	2.6.16.60-0.21-bigsmp	
SUSE LINUX Enterprise Server 10 (EM64T/AMD64)	2.6.16.21-0.8-default	8.1.6 (*2)
	2.6.16.21-0.8-smp	8.1.6.6
	2.6.16.21-0.8-bigsmp	
	2.6.16.46-0.14-default	8.1.10.3 (*2)
	2.6.16.46-0.14-smp	8.1.10.12
	2.6.16.46-0.14-bigsmp	8.2.0.22
	2.6.16.60-0.21-default	8.2.0.22 (*2)
	2.6.16.60-0.21-smp	
	2.6.16.60-0.21-bigsmp	

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OS	Kernel	Driver
	2.6.16.60-0.21-xen	8.2.0.22 (*2)
	2.6.16.60-0.54.5-default 2.6.16.60-0.54.5-smp	8.2.0.48.2p (*2)
	2.6.16.60-0.54.5-xen	8.2.0.48.2p (*2)
	2.6.16.60-0.85.1-default 2.6.16.60-0.85.1-smp	8.2.0.92.1p (*2)
	2.6.16.60-0.85.1-xen	8.2.0.92.1p (*2)
SUSE LINUX Enterprise Server 11 (IA32)	2.6.27.21-0.1.2-default 2.6.27.21-0.1.2-pae	8.2.8.14 (*2)
	2.6.27.21-0.1.2-xen	8.2.8.14 (*2)
	2.6.32.12-0.7.1-default 2.6.32.12-0.7.1-pae	8.3.5.8.1p (*2) 8.3.5.8.2p (*2)(*10)
	2.6.32.12-0.7.1-xen	8.3.5.8.1p (*2) 8.3.5.8.2p (*2)(*10)
	3.0.13-0.27-default 3.0.13-0.27-pae	8.3.5.48.2p (*2)
	3.0.76-0.11-default 3.0.76-0.11-pae	8.3.7.10.6p (*2)
SUSE LINUX Enterprise Server 11 (IPF)	2.6.27.21-0.1.2-default	8.2.8.14 (*2)
	2.6.32.12-0.7.1-default	8.3.5.8.1p (*2) 8.3.5.8.2p (*2)(*10)
	3.0.13-0.27-default	8.3.5.48.2p (*2)
	3.0.76-0.11-default	8.3.7.10.6p (*2)
SUSE LINUX Enterprise Server 11 (EM64T/AMD64)	2.6.27.21-0.1.2-default	8.2.8.14 (*2)
	2.6.27.21-0.1.2-xen	8.2.8.14 (*2)
	2.6.32.12-0.7.1-default	8.3.5.8.1p (*2) 8.3.5.8.2p (*2)(*10)
	2.6.32.12-0.7.1-xen	8.3.5.8.1p (*2) 8.3.5.8.2p (*2)(*10)
	3.0.13-0.27-default	8.3.5.48.2p (*2) (*3)
	3.0.76-0.11-default	8.3.7.10.6p (*2)
	3.0.76-0.11-xen	8.3.7.10.6p (*2)
Oracle Enterprise Linux 4 (IA32)	2.6.9-55.0.0.0.2.EL 2.6.9-55.0.0.0.2.ELsmp 2.6.9-55.0.0.0.2.ELhugemem	8.0.16.27 (*2)

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OS	Kernel	Driver
	2.6.9-67.0.0.0.1.EL 2.6.9-67.0.0.0.1.ELsmp 2.6.9-67.0.0.0.1.ELhugemem	8.0.16.34 (*2)
Oracle Enterprise Linux 4 (EM64T/AMD64)	2.6.9-55.0.0.0.2.EL 2.6.9-55.0.0.0.2.ELsmp 2.6.9-55.0.0.0.2.ELlargesmp	8.0.16.27 (*2)
	2.6.9-67.0.0.0.1.EL 2.6.9-67.0.0.0.1.ELsmp 2.6.9-67.0.0.0.1.ELlargesmp	8.0.16.34 (*2)
Oracle Enterprise Linux 5 (IA32)	2.6.18-53.el5 2.6.18-53.el5PAE	8.1.10.9 (*2)
Oracle Enterprise Linux 5 (EM64T/AMD64)	2.6.18-53.el5	8.1.10.9 (*2)
Oracle Enterprise Linux 5.4 (IA32)	2.6.18-164.el5 2.6.18-164.el5PAE	8.2.0.48.2p (*2)(*3)
Oracle Enterprise Linux 5.4 (EM64T/AMD64)	2.6.18-164.el5	8.2.0.48.2p (*2)(*3)
Oracle Enterprise Linux 5.5 (IA32)	2.6.18-194.el5 2.6.18-194.el5PAE	8.2.0.63.3p (*2)(*3)
Oracle Enterprise Linux 5.5 (EM64T/AMD64)	2.6.18-194.el5	8.2.0.63.3p (*2)(*3)
Oracle Enterprise Linux 5.6 (IA32)	2.6.18-238.el5 2.6.18-238.el5PAE	8.2.0.87.1p (*2)(*3)
Oracle Enterprise Linux 5.6 (EM64T/AMD64)	2.6.18-238.el5	8.2.0.87.1p (*2)(*3)
Oracle Enterprise Linux 5.7 (IA32)	2.6.18-274.el5 2.6.18-274.el5PAE	8.2.0.96.2p (*2)(*3)
Oracle Enterprise Linux 5.7 (EM64T/AMD64)	2.6.18-274.el5	8.2.0.96.2p (*2)(*3)
Oracle Linux 7 (EM64T/AMD64)	3.10.0-123.el6.x86_64	8.3.7.31.1p (*2)
Oracle Unbreakable Enterprise Kernel 5.6 (EM64T/AMD64)	2.6.32-100.26.2.el5	8.3.18 (*2)(*3)
Oracle Unbreakable Enterprise Kernel 5.7 (IA32)	2.6.32-200.13.1.el5uek	8.3.5.44 (*2)(*3)
	2.6.32-300.27.1.el5uek	8.3.5.45.4p (*2)(*3)
Oracle Unbreakable	2.6.32-200.13.1.el5uek	8.3.5.44 (*2)(*3)

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OS	Kernel	Driver
Enterprise Kernel 5.7 (EM64T/AMD64)	2.6.32-300.27.1.el5uek	8.3.5.45.4p (*2)(*3)
Oracle Unbreakable Enterprise Kernel 5.8 (IA32)	2.6.32-300.39.2.el5uek	8.3.5.45.4p (*2)(*3)
Oracle Unbreakable Enterprise Kernel 5.8 (EM64T/AMD64)	2.6.32-300.39.2.el5uek	8.3.5.45.4p (*2)(*3)
Oracle Unbreakable Enterprise Kernel 6.2 (IA32)	2.6.39-200.29.1.el6uek.i686	8.3.5.68.6p (*2)(*3)
	2.6.39-200.29.2.el6uek.i686	8.3.5.68.6p (*2)(*3)
Oracle Unbreakable Enterprise Kernel 6.2 (EM64T/AMD64)	2.6.39- 200.29.1.el6uek.x86_64	8.3.5.68.6p (*2)(*3)
	2.6.39- 200.29.2.el6uek.x86_64	8.3.5.68.6p (*2)(*3)
Oracle Unbreakable Enterprise Kernel 6.3 (IA32)	2.6.39-200.24.1.el6uek.i686	8.3.5.68.6p (*2)(*3)
Oracle Unbreakable Enterprise Kernel 6.3 (EM64T/AMD64)	2.6.39- 200.24.1.el6uek.x86_64	8.3.5.68.6p (*2)(*3)
Oracle Unbreakable Enterprise Kernel 6.4 (IA32)	2.6.39- 400.211.1.el6uek.i686	8.3.7.26.3p (*2)(*3)
Oracle Unbreakable Enterprise Kernel 6.4 (EM64T/AMD64)	2.6.39- 400.211.1.el6uek.x86_64	8.3.7.26.3p (*2)(*3)
Oracle Unbreakable Enterprise Kernel 6.5 (IA32)	2.6.39- 400.211.1.el6uek.i686	8.3.7.26.3p (*2)(*3)
Oracle Unbreakable Enterprise Kernel 6.5 (EM64T/AMD64)	3.8.13- 16.2.1.el6uek.x86_64	8.3.7.26.2p (*2)(*3)
Oracle Unbreakable Enterprise Kernel 7 (EM64T/AMD64)	3.8.13-44.el7uek.x86_64	8.3.7.34.4p (*2)(*3)

Note:

- *1: AMD64 indicates the environments in which 64-bit kernel packages are installed on a system using an AMD Opteron processor.
- *2: Use the driver bundled with the kernel.
- *3: Using an HDLM device as the boot disk is supported.
- *4: HDLM also supports the environments in which 32-bit kernel packages are installed on a system using an AMD Opteron processor.

*5: EM64T indicates the environments in which 64-bit kernel packages are installed on a system using an Intel EM64T processor.

*6: HP HBA drivers are supported.

*7: Supported SAN Boot by Kernel 2.6.18-53.1.21 or later.

*8: Supported by Kernel 2.6.18-164.11.1 or later.

*9: Supported by Kernel 2.6.9-89.0.11 or later.

*10: Supported by Kernel 2.6.32.36-0.5.2 or later.

(3) Hitachi

Hitachi HBA supports the environment combined with BladeSymphony only.

All drivers applied to Hitachi HBA cards for BladeSymphony are supported.

(4) IBM

OS	Kernel	Driver
Red Hat Enterprise Linux AS4/ES4 (IA32)	2.6.9-34.EL 2.6.9-34.ELsmp 2.6.9-34.ELhugemem	8.01.06 (*1)(*3)
	2.6.9-42.EL 2.6.9-42.ELhugemem	8.01.06 (*1)(*3)(*4)
	2.6.9-42.ELsmp (*2)	
Red Hat Enterprise Linux AS4 (IA32)	2.6.9-42.EL 2.6.9-42.ELsmp 2.6.9-42.ELhugemem	8.01.07.15 (*1)(*3)
	2.6.9-42.0.3.EL 2.6.9-42.0.3.ELsmp 2.6.9-42.0.3.ELhugemem	8.01.07.15 (*1)(*3)
Red Hat Enterprise Linux AS4/ES4 (IPF)	2.6.9-34.EL	8.01.06 (*1)(*3)
	2.6.9-42.EL	8.01.06 (*1)(*3)(*4)
Red Hat Enterprise Linux AS4 (IPF)	2.6.9-42.EL	8.01.07.15 (*1)(*3)
	2.6.9-42.0.3.EL	8.01.07.15 (*1)(*3)
Red Hat Enterprise Linux AS4/ES4 (EM64T/AMD64)	2.6.9-34.EL 2.6.9-34.ELsmp 2.6.9-34.ELlargesmp	8.01.06 (*1)(*3)

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OS	Kernel	Driver
	2.6.9-42.EL 2.6.9-42.ELsmp 2.6.9-42.ELlargesmp	8.01.06 (*1)(*3)(*4)
Red Hat Enterprise Linux AS4 (EM64T/AMD64)	2.6.9-42.EL 2.6.9-42.ELsmp 2.6.9-42.ELlargesmp	8.01.07.15 (*1)(*3)
	2.6.9-42.0.3.EL 2.6.9-42.0.3.ELsmp 2.6.9-42.0.3.ELlargesmp	8.01.07.15 (*1)(*3)
Red Hat Enterprise Linux AS4.5 (IA32)	2.6.9-55.EL 2.6.9-55.ELsmp 2.6.9-55.ELhugemem	8.01.07.15 (*1)(*3)
Red Hat Enterprise Linux AS4.5 (IPF)	2.6.9-55.EL 2.6.9-55.ELlargesmp	8.01.07.15 (*1)(*3)
Red Hat Enterprise Linux AS4.5 (EM64T/AMD64)	2.6.9-55.EL 2.6.9-55.ELsmp 2.6.9-55.ELlargesmp	8.01.07.15 (*1)(*3)
Red Hat Enterprise Linux AS4.6/ES4.6 (IA32)	2.6.9-67.EL 2.6.9-67.ELsmp 2.6.9-67.ELhugemem	8.02.12 (*1)(*3)
Red Hat Enterprise Linux AS4.6 (IA32)	2.6.9-67.EL 2.6.9-67.ELsmp 2.6.9-67.ELhugemem	8.01.07.15 (*1)(*3)
Red Hat Enterprise Linux AS4.6/AS4.6 (IPF)	2.6.9-67.EL 2.6.9-67.ELlargesmp	8.02.12 (*1)(*3)
Red Hat Enterprise Linux AS4.6 (IPF)	2.6.9-67.EL 2.6.9-67.ELlargesmp	8.01.07.15 (*1)(*3)
Red Hat Enterprise Linux AS4.6/ES4.6 (EM64T/AMD64)	2.6.9-67.EL 2.6.9-67.ELsmp 2.6.9-67.ELlargesmp	8.02.12 (*1)(*3)
Red Hat Enterprise Linux AS4.6 (EM64T/AMD64)	2.6.9-67.EL 2.6.9-67.ELsmp 2.6.9-67.ELlargesmp	8.01.07.15 (*1)(*3)
Red Hat Enterprise Linux AS4.7/ES4.7 (IA32)	2.6.9-78.EL 2.6.9-78.ELsmp 2.6.9-78.ELhugemem	8.02.12 (*1)(*3)
Red Hat Enterprise Linux AS4.7 (IA32)	2.6.9-78.EL 2.6.9-78.ELsmp 2.6.9-78.ELhugemem	8.01.07.15 (*1)(*3)

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OS	Kernel	Driver
Red Hat Enterprise Linux AS4.7/ES4.7 (IPF)	2.6.9-78.EL 2.6.9-78.ELlargesmp	8.02.12 (*1)(*3)
Red Hat Enterprise Linux AS4.7 (IPF)	2.6.9-78.EL 2.6.9-78.ELlargesmp	8.01.07.15 (*1)(*3)
Red Hat Enterprise Linux AS4.7/ES4.7 (EM64T/AMD64)	2.6.9-78.EL 2.6.9-78.ELsmp 2.6.9-78.ELlargesmp	8.02.12 (*1)(*3)
Red Hat Enterprise Linux AS4.7 (EM64T/AMD64)	2.6.9-78.EL 2.6.9-78.ELsmp 2.6.9-78.ELlargesmp	8.01.07.15 (*1)(*3)
Red Hat Enterprise Linux 5 Advanced Platform/Red Hat Enterprise Linux 5 (IA32)	2.6.18-8.el5 2.6.18-8.el5PAE	8.02.12 (*1)(*3)
Red Hat Enterprise Linux 5 Advanced Platform/Red Hat Enterprise Linux 5 (IPF)	2.6.18-8.el5	8.02.12 (*1)(*3)
Red Hat Enterprise Linux 5 Advanced Platform/Red Hat Enterprise Linux 5 (EM64T/AMD64)	2.6.18-8.el5	8.02.12 (*1)(*3)
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (IA32)	2.6.18-53.el5 2.6.18-53.el5PAE	8.1.10.9 (*5) 8.02.12 (*1)(*3) 8.02.14 (*1)(*3)
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (IPF)	2.6.18-53.el5	8.1.10.9 (*5) 8.02.12 (*1)(*3) 8.02.14 (*1)(*3)
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (EM64T/AMD64)	2.6.18-53.el5	8.1.10.9 (*5) 8.02.12 (*1)(*3) 8.02.14 (*1)(*3)
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (IA32)	2.6.18-92.el5 2.6.18-92.el5PAE	8.02.12 (*1)(*3) 8.02.14 (*1)(*3)
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (IPF)	2.6.18-92.el5	8.02.12 (*1)(*3) 8.02.14 (*1)(*3)
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (EM64T/AMD64)	2.6.18-92.el5	8.02.12 (*1)(*3) 8.02.14 (*1)(*3)

Appendix A

OS	Kernel	Driver
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (IA32)	2.6.18-128.el5 2.6.18-128.el5PAE	8.02.00.51 (*1) 8.03.01.06 (*8)
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (EM64T/AMD64)	2.6.18-128.el5	8.02.00.51 (*1) 8.03.01.06 (*8)
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (IA32)	2.6.18-164.el5 2.6.18-164.el5PAE	8.03.00.10.05.04-k (*1)(*3) 8.03.00.1.05.05-k (*1)(*3)(*6) 8.03.01.06 (*8)
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (EM64T/AMD64)	2.6.18-164.el5	8.03.00.10.05.04-k (*1)(*3) 8.03.00.1.05.05-k (*1)(*3)(*6) 8.03.01.06 (*8)
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (IA32)	2.6.18-194.el5 2.6.18-194.el5PAE	8.03.01.04.05.05-k (*1)(*3) 8.03.01.04.05.05-k (*1)(*3)(*7)(*8) 8.03.01.06 (*8)
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (EM64T/AMD64)	2.6.18-194.el5	8.03.01.04.05.05-k (*1)(*3) 8.03.01.04.05.05-k (*1)(*3)(*7)(*8) 8.03.01.06 (*8)
Red Hat Enterprise Linux 6.4 (IA32)	2.6.32-358.el6.i686	8.3.7.29-1
Red Hat Enterprise Linux 6.4 (EM64T/AMD64)	2.6.32-358.el6.x86_64	8.3.7.29-1
SUSE LINUX Enterprise Server 10 (IA32)	2.6.16.21-0.8-default 2.6.16.21-0.8-smp 2.6.16.21-0.8-bigsmp	8.1.6.6 (*5)
SUSE LINUX Enterprise Server 10 (IPF)	2.6.16.21-0.8-default	8.1.6.6 (*5)
SUSE LINUX Enterprise Server 10 (EM64T/AMD64)	2.6.16.21-0.8-default 2.6.16.21-0.8-smp	8.1.6.6 (*5)

Note:

- *1: QLogic HBA drivers are supported.
- *2: HDLM also supports the environments in which 32-bit kernel packages are installed on a system using an AMD Opteron processor.

*3: Since the failover function is Enable by default, change it to Disable. For changing the setting of the failover function to Disable, set the following in /etc/modprobe.conf file.

Example: When the driver version is 8.01.01.

```
options qla2xxx ql2xfailover=0
```

Refer to the document of the HBA attachment for details of the setting change of the failover function.

*4: The drivers mentioned in the page of "Hitachi Data Systems - HBA Approved Software" in the QLogic website are supported. Get the drivers from the following URL:

http://support.qlogic.com/support/oem_detail_hds.asp?oemid=84&classid=237

The above-mentioned URL may be changed without notice. When the URL is changed, look for the page of "Hitachi Data Systems - HBA Approved Software" in the QLogic website.

*5: Emulex HBA drivers are supported.

*6: Supported by Kernel 2.6.18-164.9.1 or later.

*7: The supported combination of IBM model and Bus I/F are shown below.

44X1945

*8: Using an HDLM device as the boot disk is supported.

(5) HP

OS	Kernel	Driver
Red Hat Enterprise Linux AS4/ES4 (IA32)	2.6.9-34.EL 2.6z9-34.ELsmp 2.6.9-34.ELhugemem	8.01.02-d4 (*1)(*2)(*3) 8.01.06 (*1)(*4) 8.0.16.32
	2.6.9-42.EL 2.6.9-42.ELhugemem	8.01.06 (*1)(*4)(*5) 8.0.16.32 8.01.07.25
	2.6.9-42.ELsmp (*7)	8.01.06 (*1)(*4)(*5) 8.0.16.32 8.01.07.25
	2.6.9-42.0.3.EL 2.6.9-42.0.3.ELsmp 2.6.9-42.0.3.ELhugemem	8.0.16.32 8.01.07.25
Red Hat Enterprise Linux AS4/ES4 (IPF)	2.6.9-34.EL	8.0.16.32
	2.6.9-42.EL	8.0.16.32

Appendix A

OS	Kernel	Driver
	2.6.9-42.0.3.EL	8.0.16.32
Red Hat Enterprise Linux AS4/ES4 (EM64T/AMD64)	2.6.9-34.EL	8.01.02-d4 (*1)(*2)(*3)
	2.6.9-34.ELsmp	8.01.06 (*1)(*4)
	2.6.9-34.ELlargesmp	8.0.16.32 (*9)
	2.6.9-42.EL	8.01.06 (*1)(*4)(*5)
	2.6.9-42.ELsmp	8.0.16.32
	2.6.9-42.ELlargesmp	8.01.07.25
	2.6.9-42.0.3.EL	8.0.16.32
	2.6.9-42.0.3.ELsmp	8.01.07.25
	2.6.9-42.0.3.ELlargesmp	
Red Hat Enterprise Linux AS4.5/ES4.5 (IA32)	2.6.9-55.EL	8.0.16.27
	2.6.9-55.ELsmp	8.0.16.32
	2.6.9-55.ELhugemem	8.01.06.01 (*1)(*4)
		8.01.07.25
		8.02.11
Red Hat Enterprise Linux AS4.5/ES4.5 (IPF)	2.6.9-55.EL	8.0.16.27
	2.6.9-55.ELlargesmp	8.0.16.32
		8.01.06.01 (*1)(*4)
Red Hat Enterprise Linux AS4.5/ES4.5 (EM64T/AMD64)	2.6.9-55.EL	8.0.16.27
	2.6.9-55.ELsmp	8.0.16.32
	2.6.9-55.ELlargesmp	8.01.06.01 (*1)(*4)
		8.01.07.25 (*1)(*4)
		8.02.11
Red Hat Enterprise Linux AS4.6/ES4.6 (IA32)	2.6.9-67.EL	8.0.16.27
	2.6.9-67.ELsmp	8.01.07.25
	2.6.9-67.ELhugemem	8.02.11
		8.02.23-2
Red Hat Enterprise Linux AS4.6/ES4.6 (IPF)	2.6.9-67.EL	8.0.16.27
	2.6.9-67.ELlargesmp	
Red Hat Enterprise Linux AS4.6/ES4.6 (EM64T/AMD64)	2.6.9-67.EL	8.0.16.27
	2.6.9-67.ELsmp	8.01.07.25
	2.6.9-67.ELlargesmp	8.02.11
		8.02.23-2
Red Hat Enterprise Linux AS4.7/ES4.7 (IA32)	2.6.9-78.EL	8.01.07.25
	2.6.9-78.ELsmp	8.02.11
	2.6.9-78.ELhugemem	
Red Hat Enterprise Linux AS4.7/ES4.7 (EM64T/AMD64)	2.6.9-78.EL	8.01.07.25
	2.6.9-78.ELsmp	8.02.11
	2.6.9-78.ELlargesmp	

Appendix A

OS	Kernel	Driver
Red Hat Enterprise Linux 5 Advanced Platform/Red Hat Enterprise Linux 5 (IA32)	2.6.18-8.el5 2.6.18-8.el5PAE	8.1.10.11 8.2.0.33.3p (*9)
Red Hat Enterprise Linux 5 Advanced Platform/Red Hat Enterprise Linux 5 (IPF)	2.6.18-8.el5	8.2.0.33.3p (*9)
Red Hat Enterprise Linux 5 Advanced Platform/Red Hat Enterprise Linux 5 (EM64T/AMD64)	2.6.18-8.el5	8.1.10.11 8.2.0.33.3p (*9)
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (IA32)	2.6.18-53.el5 2.6.18-53.el5PAE	8.01.07.25 8.02.11 8.2.0.33.3p (*9) 8.01.07.25-2
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (IPF)	2.6.18-53.el5	8.2.0.33.3p (*9)
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (EM64T/AMD64)	2.6.18-53.el5	8.01.07.25 8.02.11 8.2.0.33.3p (*9) 8.01.07.25-2
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (IA32)	2.6.18-92.el5 2.6.18-92.el5PAE	8.01.07.25 8.02.11 8.2.0.22_p1 (*3)(*6)(*8) 8.2.0.33.3p (*9)
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (IPF)	2.6.18-92.el5	8.2.0.33.3p (*9)
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (EM64T/AMD64)	2.6.18-92.el5	8.01.07.25 8.02.11 8.2.0.22_p1 (*3)(*6)(*8) 8.2.0.33.3p (*9)
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (IA32)	2.6.18-128.el5 2.6.18-128.el5PAE	8.2.0.33.3p (*2)(*9)

Appendix A

OS	Kernel	Driver
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (IPF)	2.6.18-128.el5	8.2.0.33.3p (*2)(*9)
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (EM64T/AMD64)	2.6.18-128.el5	8.2.0.33.3p (*2)(*9)
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (IA32)	2.6.18-164.el5 2.6.18-164.el5PAE	8.03.00.10.05.04-k (*1)(*2)(*4) 8.03.00.1.05.05-k (*1)(*2)(*4)(*10) 8.2.0.48.2p (*2)(*9) 8.2.0.48.3p (*2)(*9) (*11) 8.03.01.05.05.06-k 8.03.03.15.05.06 (*3)
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (IPF)	2.6.18-164.el5	8.03.00.10.05.04-k (*1)(*2)(*4) 8.03.00.1.05.05-k (*1)(*2)(*4)(*10) 8.2.0.48.2p (*2)(*9) 8.2.0.48.3p (*2)(*9) (*11) 8.03.01.05.05.06-k
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (EM64T/AMD64)	2.6.18-164.el5	8.03.00.10.05.04-k (*1)(*2)(*4) 8.03.00.1.05.05-k (*1)(*2)(*4)(*10) 8.2.0.48.2p (*2)(*9) 8.2.0.48.3p (*2)(*9) (*11) 8.03.01.05.05.06-k 8.03.03.15.05.06 (*3)
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (IA32)	2.6.18-194.el5 2.6.18-194.el5PAE	8.03.01.04.05.05-k (*1)(*2)(*4) 8.2.0.63.3p (*2)(*9) 8.03.03.15.05.06 (*3) 8.03.07.03.5.6 (*3) 8.2.0.106-1 (*3) 8.2.0.134
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (IPF)	2.6.18-194.el5	8.2.0.63.3p (*2)(*9) 8.2.0.106-1 (*3) 8.2.0.134
Red Hat Enterprise Linux 5.5 Advanced	2.6.18-194.el5	8.03.01.04.05.05-k (*1)(*2)(*4)

Appendix A

OS	Kernel	Driver
Platform/Red Hat Enterprise Linux 5.5 (EM64T/AMD64)		8.2.0.63.3p (*2)(*9) 8.03.03.15.05.06 (*3) 8.03.07.03.5.6 (*3) 8.2.0.106-1 (*3) 8.2.0.134
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (IA32)	2.6.18-238.el5 2.6.18-238.el5PAE	8.03.07.03.5.6 (*3) 8.2.0.106-1 (*3) 8.2.0.134
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (IPF)	2.6.18-238.el5	8.2.0.106-1 (*3) 8.2.0.134
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (EM64T/AMD64)	2.6.18-238.el5	8.03.07.03.5.6 (*3) 8.2.0.106-1 (*3) 8.2.0.134
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (IA32)	2.6.18-274.el5 2.6.18-274.el5PAE	8.2.0.134 8.03.07.03.5.6 (*3) 8.03.07.14.5.6 (*3)
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (IPF)	2.6.18-274.el5	8.2.0.134
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (EM64T/AMD64)	2.6.18-274.el5	8.2.0.134 8.03.07.03.5.6 (*3) 8.03.07.14.5.6 (*3)
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (IA32)	2.6.18-308.el5 2.6.18-308.el5PAE	8.2.0.134 8.03.07.14.5.6 (*3) 8.04.00.10.5.6 (*3)
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (IPF)	2.6.18-308.el5	8.2.0.134
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (EM64T/AMD64)	2.6.18-308.el5	8.2.0.134 8.03.07.14.5.6 (*3) 8.04.00.10.5.6 (*3)

Appendix A

OS	Kernel	Driver
Red Hat Enterprise Linux 5.9 Advanced Platform/Red Hat Enterprise Linux 5.9 (IA32)	2.6.18-348.el5 2.6.18-348.el5PAE	8.04.00.10.5.6 (*3)
Red Hat Enterprise Linux 5.9 Advanced Platform/Red Hat Enterprise Linux 5.9 (EM64T/AMD64)	2.6.18-348.el5	8.04.00.10.5.6 (*3)
Red Hat Enterprise Linux 6.4(EM64T/AMD64)	2.6.32-358.el6.x86_64	8.04.00.12.06.0-k2 8.07.00.08.06.0-k (*3)
SUSE LINUX Enterprise Server 10 (IA32)	2.6.16.46-0.14-default 2.6.16.46-0.14-smp 2.6.16.46-0.14-bigsmp	8.01.07-k3 (*1)(*2)(*4)
SUSE LINUX Enterprise Server 10 (EM64T/AMD64)	2.6.16.46-0.14-default 2.6.16.46-0.14-smp	8.01.07-k3 (*1)(*2)(*4)

Note:

- *1: QLogic HBA drivers are supported.
- *2: Use the driver bundled with the kernel.
- *3: Using an HDLM device as the boot disk is supported.
- *4: Since the failover function is Enable by default, change it to Disable. For changing the setting of the failover function to Disable, set the following in /etc/modprobe.conf file.

Example: When the driver version is 8.01.01.

```
options qla2xxx ql2xfailover=0
```

Refer to the document of the HBA attachment for details of the setting change of the failover function.

- *5: The drivers mentioned in the page of "Hitachi Data Systems - HBA Approved Software" in the QLogic website are supported. Get the drivers from the following URL:
http://support.qlogic.com/support/oem_detail_hds.asp?oemid=84&classid=237
The above-mentioned URL may be changed without notice. When the URL is changed, look for the page of "Hitachi Data Systems - HBA Approved Software" in the QLogic website.
- *6: The supported combinations of HP models and Bus I/Fs are shown below.
FC2143, FC2243, FC2142SR, FC2242SR
- *7: HDLM also supports the environments in which 32-bit kernel packages are installed on a system using an AMD Opteron processor.

*8: The supported combinations of HP models and Bus I/Fs are shown below.

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*9: Emulex HBA drivers are supported.

*10: Supported by Kernel 2.6.18-164.9.1 or later.

*11: Supported by Kernel 2.6.18-164.11.1 or later.

(6) Brocade

OS	Kernel	Driver
Red Hat Enterprise Linux AS4.6/ES4.6 (IA32)	2.6.9-67.EL 2.6.9-67.ELsmp 2.6.9-67.ELhugemem	1.1.0.1
Red Hat Enterprise Linux AS4.6/ES4.6 (EM64T/AMD64)	2.6.9-67.EL 2.6.9-67.ELsmp 2.6.9-67.ELlargesmp	1.1.0.1
Red Hat Enterprise Linux AS4.7/ES4.7 (IA32)	2.6.9-78.EL 2.6.9-78.ELsmp 2.6.9-78.ELhugemem	1.1.0.1
Red Hat Enterprise Linux AS4.7/ES4.7 (EM64T/AMD64)	2.6.9-78.EL 2.6.9-78.ELsmp 2.6.9-78.ELlargesmp	1.1.0.1
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (IA32)	2.6.18-53.el5 2.6.18-53.el5PAE	1.0.0.3 1.1.0.1 1.1.0.6 (*1) 2.1.0.0 (*1)
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (IPF)	2.6.18-53.el5	1.1.0.1 1.1.0.6 2.1.0.0 2.1.0.0
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (EM64T/AMD64)	2.6.18-53.el5	1.0.0.3 1.1.0.1 1.1.0.6 (*1) 2.1.0.0 (*1)
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (IA32)	2.6.18-92.el5 2.6.18-92.el5PAE	1.0.0.3 1.1.0.1 1.1.0.6 (*1) 2.1.0.0 (*1) 2.1.0.2

Appendix A

OS	Kernel	Driver
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (IPF)	2.6.18-92.el5	1.1.0.1 1.1.0.6 2.1.0.0 2.1.0.2
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (EM64T/AMD64)	2.6.18-92.el5	1.0.0.3 1.1.0.1 1.1.0.6 (*1) 2.1.0.0 (*1) 2.1.0.2
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (IA32)	2.6.18-128.el5 2.6.18-128.el5PAE	1.1.0.6 (*1) 2.1.0.0 (*1) 2.1.0.2 2.2.0.0 2.3.0.0 3.0.0.0
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (IPF)	2.6.18-128.el5	1.1.0.6 2.1.0.0 2.1.0.2 2.2.0.0 2.3.0.0 3.0.0.0
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (EM64T/AMD64)	2.6.18-128.el5	1.1.0.6 (*1) 2.1.0.0 (*1) 2.1.0.2 2.2.0.0 2.3.0.0 3.0.0.0
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (IA32)	2.6.18-164.el5 2.6.18-164.el5PAE	2.1.0.0 (*1) 2.1.0.2 2.2.0.0 (*1) 2.3.0.0 (*1) 3.0.0.0
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (IPF)	2.6.18-164.el5	2.1.0.0 2.1.0.2 2.2.0.0 (*1) 2.3.0.0 (*1) 3.0.0.0
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (EM64T/AMD64)	2.6.18-164.el5	2.1.0.0 (*1) 2.1.0.2 2.2.0.0 (*1) 2.3.0.0 (*1) 3.0.0.0

Appendix A

OS	Kernel	Driver
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (IA32)	2.6.18-194.el5 2.6.18-194.el5PAE	2.1.0.0 2.2.0.0 (*1) 2.3.0.0 (*1) 3.0.0.0 (*1)
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (IPF)	2.6.18-194.el5	2.1.0.0 2.2.0.0 (*1) 2.3.0.0 (*1) 3.0.0.0 (*1)
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (EM64T/AMD64)	2.6.18-194.el5	2.1.0.0 2.2.0.0 (*1) 2.3.0.0 (*1) 3.0.0.0 (*1)
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (IA32)	2.6.18-238.el5 2.6.18-238.el5PAE	3.0.0.0 (*1)
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (IPF)	2.6.18-238.el5	3.0.0.0 (*1)
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (EM64T/AMD64)	2.6.18-238.el5	3.0.0.0 (*1)
Red Hat Enterprise Linux 6 (IA32)	2.6.32-71.el6.i686	2.3.0.0 (*1)
Red Hat Enterprise Linux 6 (EM64T/AMD64)	2.6.32-71.el6.x86_64	2.3.0.0 (*1)
Red Hat Enterprise Linux 6.1 (IA32)	2.6.32-131.0.15.el6.i686	3.0.0.0 (*1)
Red Hat Enterprise Linux 6 .1(EM64T/AMD64)	2.6.32-131.0.15.el6.x86_64	3.0.0.0 (*1)

Appendix A

OS	Kernel	Driver
SUSE LINUX Enterprise Server 10 (IA32)	2.6.16.60-0.21-default	1.0.0.2
	2.6.16.60-0.21-smp	1.0.0.3
	2.6.16.60-0.21-bigsmp	1.1.0.1
		2.1.0.0
		2.2.0.0 (*1)
SUSE LINUX Enterprise Server 10 (IPF)	2.6.16.60-0.21-default	1.0.0.2
		1.0.0.3
		1.1.0.1
		2.1.0.0
		2.2.0.0 (*1)
SUSE LINUX Enterprise Server 10 (EM64T/AMD64)	2.6.16.60-0.21-default	1.0.0.2
	2.6.16.60-0.21-smp	1.0.0.3
		1.1.0.1
		2.1.0.0
		2.2.0.0 (*1)
SUSE LINUX Enterprise Server 11 (IA32)	2.6.27.21-0.1.2-default	2.1.0.0
	2.6.27.21-0.1.2-pae	2.2.0.0 (*1)
	2.6.32.12-0.7.1-default	2.3.0.0 (*1)
	2.6.32.12-0.7.1-pae	
	2.6.32.12-0.7.1-xen	
SUSE LINUX Enterprise Server 11 (IPF)	2.6.27.21-0.1.2-default	2.1.0.0
		2.2.0.0 (*1)
	2.6.32.12-0.7.1-default	2.3.0.0 (*1)
SUSE LINUX Enterprise Server 11 (EM64T/AMD64)	2.6.27.21-0.1.2-default	2.1.0.0
		2.2.0.0 (*1)
	2.6.32.12-0.7.1-default	2.3.0.0 (*1)
	2.6.32.12-0.7.1-xen	

Note:

*1: Using an HDLM device as the boot disk is supported.

(7) Cisco

OS	Kernel	Driver
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (EM64T/AMD64)	2.6.18-194.el5	1.4.0.145

Use the Fibre Channel over Ethernet (FCoE) I/F adapters given below. When using two or more adapters, use the same type of adapter. If you combine different types of HBA, HDLM may not be able to switch a path when an error occurs.

(1) QLogic (*1)

OS	Kernel	Driver
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (IA32)	2.6.18-128.el5 2.6.18-128.el5PAE	8.03.00.09
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (IPF)	2.6.18-128.el5	8.03.00.09
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (EM64T/AMD64)	2.6.18-128.el5	8.03.00.09
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (IA32)	2.6.18-164.el5 2.6.18-164.el5PAE	8.03.03.15.05.06
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (EM64T/AMD64)	2.6.18-164.el5	8.03.03.15.05.06
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (IA32)	2.6.18-194.el5 2.6.18-194.el5PAE	8.03.03.15.05.06

Appendix A

OS	Kernel	Driver
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (EM64T/AMD64)	2.6.18-194.el5	8.03.03.15.05.06
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (IA32)	2.6.18-274.el5 2.6.18-274.el5PAE	8.03.07.03.05.07-k
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (IPF)	2.6.18-274.el5	8.03.07.03.05.07-k
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (EM64T/AMD64)	2.6.18-274.el5	8.03.07.03.05.07-k
Red Hat Enterprise Linux 6 (IA32)	2.6.32-71.el6.i686	8.03.04.12.06.0-k0
Red Hat Enterprise Linux 6 (EM64T/AMD64)	2.6.32-71.el6.x86_64	8.03.04.12.06.0-k0
Red Hat Enterprise Linux 6.3 (IA32)	2.6.32-279.el6.i686	8.04.00.04.06.3-k
Red Hat Enterprise Linux 6.3 (EM64T/AMD64)	2.6.32-279.el6.x86_64	8.04.00.04.06.3-k
SUSE LINUX Enterprise Server 10 (IA32)	2.6.16.60-0.21-default	8.03.00.08
	2.6.16.60-0.21-smp	
	2.6.16.60-0.21-bigsmpt	
	2.6.16.60-0.54.5-default	8.03.01.13.10.3-k4
SUSE LINUX Enterprise Server 10 (EM64T/AMD64)	2.6.16.60-0.21-default	8.03.00.08
	2.6.16.60-0.21-smp	
	2.6.16.60-0.54.5-default	8.03.01.13.10.3-k4
	2.6.16.60-0.54.5-smp	
SUSE LINUX Enterprise Server 11 (IA32)	2.6.27.21-0.1.2-default	8.03.01.15.11.0-k4
	2.6.27.21-0.1.2-pae	
	2.6.27.21-0.1.2-xen	8.03.01.15.11.0-k4
	2.6.32.12-0.7.1-default	8.03.04.14.11.1-k0
	2.6.32.12-0.7.1-pae	
	2.6.32.12-0.7.1-xen	8.03.04.14.11.1-k0

OS	Kernel	Driver
SUSE LINUX Enterprise Server 11 (EM64T/AMD64)	2.6.27.21-0.1.2-default	8.03.01.15.11.0-k4
	2.6.27.21-0.1.2-xen	8.03.01.15.11.0-k4
	2.6.32.12-0.7.1-default	8.03.04.14.11.1-k0
	2.6.32.12-0.7.1-xen	8.03.04.14.11.1-k0

Note:

*1: Do not use the HBA driver's failover function.

Check the setting for the failover function by performing the following procedure:

- For Red Hat Enterprise Linux 5.3 Advanced Platform, Red Hat Enterprise Linux 5.3, Red Hat Enterprise Linux 5.4 Advanced Platform, Red Hat Enterprise Linux 5.4, Red Hat Enterprise Linux 5.5 Advanced Platform, Red Hat Enterprise Linux 5.5, Red Hat Enterprise Linux 5.7 Advanced Platform, Red Hat Enterprise Linux 5.7, Red Hat Enterprise Linux 6, Red Hat Enterprise Linux 6.3, SUSE LINUX Enterprise Server 10, and SUSE LINUX Enterprise Server 11:

1) Execute the following command to check the version of the driver:

```
# cat /sys/class/scsi_host/hostn/driver_version
```

n: the instance number of the HBA port

2) Check the output result to see whether the characters "fo" are added to the version notation.

- When the failover function is enabled:

```
8.01.07-k1-fo
```

- When the failover function is disabled:

```
8.01.07-k1
```

(2) Emulex

OS	Kernel	Driver
Red Hat Enterprise Linux AS4/ES4 (IA32)	2.6.9-34.EL	8.0.16.44
	2.6.9-34.ELsmp	
	2.6.9-34.ELhugemem	
	2.6.9-34.0.2.EL	8.0.16.44
	2.6.9-34.0.2.ELsmp	
	2.6.9-34.0.2.ELhugemem	
	2.6.9-42.EL	8.0.16.44
	2.6.9-42.ELsmp	
	2.6.9-42.ELhugemem	

Appendix A

OS	Kernel	Driver
	2.6.9-42.0.3.EL 2.6.9-42.0.3.ELsmp 2.6.9-42.0.3.ELhugemem	8.0.16.44
Red Hat Enterprise Linux AS4/ES4 (IPF)	2.6.9-34.EL	8.0.16.44
	2.6.9-42.EL	8.0.16.44
	2.6.9-42.0.3.EL	8.0.16.44
Red Hat Enterprise Linux AS4/ES4 (EM64T/AMD64)	2.6.9-34.EL	8.0.16.44
	2.6.9-34.ELsmp	
	2.6.9-34.ELlargesmp	
	2.6.9-34.0.2.EL	8.0.16.44
	2.6.9-34.0.2.ELsmp	
	2.6.9-34.0.2.ELlargesmp	
	2.6.9-42.EL	8.0.16.44
2.6.9-42.ELsmp		
2.6.9-42.ELlargesmp		
2.6.9-42.0.3.EL	8.0.16.44	
2.6.9-42.0.3.ELsmp		
2.6.9-42.0.3.ELlargesmp		
Red Hat Enterprise Linux AS4.5/ES4.5 (IA32)	2.6.9-55.EL	8.0.16.44
	2.6.9-55.ELsmp	
	2.6.9-55.ELhugemem	
Red Hat Enterprise Linux AS4.5/ES4.5 (IPF)	2.6.9-55.EL	8.0.16.44
	2.6.9-55.ELlargesmp	
Red Hat Enterprise Linux AS4.5/ES4.5 (EM64T/AMD64)	2.6.9-55.EL	8.0.16.44
	2.6.9-55.ELsmp	
	2.6.9-55.ELlargesmp	
Red Hat Enterprise Linux AS4.6/ES4.6 (IA32)	2.6.9-67.EL	8.0.16.44
	2.6.9-67.ELsmp	
	2.6.9-67.ELhugemem	
Red Hat Enterprise Linux AS4.6/ES4.6 (IPF)	2.6.9-67.EL	8.0.16.44
	2.6.9-67.ELlargesmp	
Red Hat Enterprise Linux AS4.6/ES4.6 (EM64T/AMD64)	2.6.9-67.EL	8.0.16.44
	2.6.9-67.ELsmp	
	2.6.9-67.ELlargesmp	
Red Hat Enterprise Linux AS4.7/ES4.7 (IA32)	2.6.9-78.EL	8.0.16.44
	2.6.9-78.ELsmp	
	2.6.9-78.ELhugemem	
Red Hat Enterprise Linux AS4.7/ES4.7 (IPF)	2.6.9-78.EL	8.0.16.44
	2.6.9-78.ELlargesmp	

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OS	Kernel	Driver
Red Hat Enterprise Linux AS4.7/ES4.7 (EM64T/AMD64)	2.6.9-78.EL 2.6.9-78.ELsmp 2.6.9-78.ELlargesmp	8.0.16.44
Red Hat Enterprise Linux 5 Advanced Platform/Red Hat Enterprise Linux 5 (IA32)	2.6.18-8.el5 2.6.18-8.el5PAE	8.2.0.29
Red Hat Enterprise Linux 5 Advanced Platform/Red Hat Enterprise Linux 5 (IPF)	2.6.18-8.el5	8.2.0.29
Red Hat Enterprise Linux 5 Advanced Platform/Red Hat Enterprise Linux 5 (EM64T/AMD64)	2.6.18-8.el5	8.2.0.29
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (IA32)	2.6.18-53.el5 2.6.18-53.el5PAE	8.2.0.29
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (IPF)	2.6.18-53.el5	8.2.0.29
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (EM64T/AMD64)	2.6.18-53.el5	8.2.0.29
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (IA32)	2.6.18-92.el5 2.6.18-92.el5PAE	8.2.0.29
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (IPF)	2.6.18-92.el5	8.2.0.29
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (EM64T/AMD64)	2.6.18-92.el5	8.2.0.29
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (IA32)	2.6.18-164.el5 2.6.18-164.el5PAE	8.2.0.71

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OS	Kernel	Driver
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (IPF)	2.6.18-164.el5	8.2.0.71
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (EM64T/AMD64)	2.6.18-164.el5	8.2.0.71
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (IA32)	2.6.18-194.el5 2.6.18-194.el5PAE	8.2.0.71 8.2.0.96 8.2.0.126
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (IPF)	2.6.18-194.el5	8.2.0.71 8.2.0.126
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (EM64T/AMD64)	2.6.18-194.el5	8.2.0.71 8.2.0.96 8.2.0.126
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (IA32)	2.6.18-238.el5 2.6.18-238.el5PAE	8.2.0.96 8.2.0.126
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (IPF)	2.6.18-238.el5	8.2.0.126
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (EM64T/AMD64)	2.6.18-238.el5	8.2.0.96 8.2.0.126
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (IA32)	2.6.18-274.el5 2.6.18-274.el5PAE	8.2.0.126
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (IPF)	2.6.18-274.el5	8.2.0.126
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (EM64T/AMD64)	2.6.18-274.el5	8.2.0.126

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OS	Kernel	Driver
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (IA32)	2.6.18-308.el5 2.6.18-308.el5PAE	8.2.0.108.4p (*2)
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (IPF)	2.6.18-308.el5	8.2.0.108.4p (*2)
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (EM64T/AMD64)	2.6.18-308.el5	8.2.0.108.4p (*2)
Red Hat Enterprise Linux 6 (IA32)	2.6.32-71.el6.i686	8.3.5.65 (*1)
Red Hat Enterprise Linux 6 (EM64T/AMD64)	2.6.32-71.el6.x86_64	8.3.5.65 (*1)
Red Hat Enterprise Linux 6.1 (IA32)	2.6.32-131.0.15.el6.i686	8.3.5.30.1p 8.3.5.65 (*1)
Red Hat Enterprise Linux 6.1 (EM64T/AMD64)	2.6.32-131.0.15.el6.x86_64	8.3.5.30.1p 8.3.5.65 (*1)
Red Hat Enterprise Linux 6.2 (IA32)	2.6.32-220.el6.i686	8.3.5.65 (*1)
Red Hat Enterprise Linux 6.2 (EM64T/AMD64)	2.6.32-220.el6.x86_64	8.3.5.65 (*1)
SUSE LINUX Enterprise Server 10 (IA32)	2.6.16.46-0.14-default	8.2.0.29
	2.6.16.46-0.14-smp	
	2.6.16.46-0.14-bigsm	
	2.6.16.60-0.21-default	8.2.0.29
	2.6.16.60-0.21-smp	8.2.0.96
SUSE LINUX Enterprise Server 10 (IPF)	2.6.16.60-0.21-bigsm	
	2.6.16.60-0.21-xenpae	8.2.0.96
	2.6.16.60-0.54.5-default	8.2.0.96
	2.6.16.60-0.54.5-smp	
SUSE LINUX Enterprise Server 10 (IPF)	2.6.16.60-0.54.5-bigsm	
	2.6.16.60-0.54.5-xenpae	
	2.6.16.60-0.54.5-smp	

Appendix A

OS	Kernel	Driver
SUSE LINUX Enterprise Server 10 (EM64T/AMD64)	2.6.16.46-0.14-default 2.6.16.46-0.14-smp	8.2.0.29
	2.6.16.60-0.21-default 2.6.16.60-0.21-smp	8.2.0.29 8.2.0.96
	2.6.16.60-0.21-xen	8.2.0.96
	2.6.16.60-0.54.5-default 2.6.16.60-0.54.5-xen	8.2.0.96
SUSE LINUX Enterprise Server 11 (IA32)	2.6.32.12-0.7.1-default 2.6.32.12-0.7.1-pae 2.6.32.12-0.7.1-xen	8.3.5.35
	2.6.32.12-0.7.1-default 2.6.32.12-0.7.1-xen	8.3.5.35

Note:

*1: Using an HDLM device as the boot disk is supported.

*2: Use the driver bundled with the kernel.

(3) Brocade

OS	Kernel	Driver
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (IA32)	2.6.18-53.el5 2.6.18-53.el5PAE	2.1.0.0 (*1)
	2.6.18-53.el5	2.1.0.0
Red Hat Enterprise Linux 5.1 Advanced Platform/Red Hat Enterprise Linux 5.1 (EM64T/AMD64)	2.6.18-53.el5	2.1.0.0 (*1)
	2.6.18-92.el5 2.6.18-92.el5PAE	2.1.0.0 (*1)
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (IPF)	2.6.18-92.el5	2.1.0.0

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OS	Kernel	Driver
Red Hat Enterprise Linux 5.2 Advanced Platform/Red Hat Enterprise Linux 5.2 (EM64T/AMD64)	2.6.18-92.el5	2.1.0.0 (*1)
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (IA32)	2.6.18-128.el5 2.6.18-128.el5PAE	2.1.0.0 (*1) 2.2.0.0 2.3.0.0
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (IPF)	2.6.18-128.el5	2.1.0.0 2.2.0.0 2.3.0.0
Red Hat Enterprise Linux 5.3 Advanced Platform/Red Hat Enterprise Linux 5.3 (EM64T/AMD64)	2.6.18-128.el5	2.1.0.0 (*1) 2.2.0.0 2.3.0.0
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (IA32)	2.6.18-164.el5 2.6.18-164.el5PAE	2.1.0.0 (*1) 2.2.0.0 (*1) 2.3.0.0 (*1)
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (IPF)	2.6.18-164.el5	2.1.0.0 2.2.0.0 (*1) 2.3.0.0 (*1)
Red Hat Enterprise Linux 5.4 Advanced Platform/Red Hat Enterprise Linux 5.4 (EM64T/AMD64)	2.6.18-164.el5	2.1.0.0 (*1) 2.2.0.0 (*1) 2.3.0.0 (*1)
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (IA32)	2.6.18-194.el5 2.6.18-194.el5PAE	2.1.0.0 2.2.0.0 (*1) 2.3.0.0 (*1)
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (IPF)	2.6.18-194.el5	2.1.0.0 2.2.0.0 (*1) 2.3.0.0 (*1)
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (EM64T/AMD64)	2.6.18-194.el5	2.1.0.0 2.2.0.0 (*1) 2.3.0.0 (*1)
Red Hat Enterprise Linux 6 (IA32)	2.6.32-71.el6.i686	2.3.0.0 (*1)

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OS	Kernel	Driver
Red Hat Enterprise Linux 6 (EM64T/AMD64)	2.6.32-71.el6.x86_64	2.3.0.0 (*1)
SUSE LINUX Enterprise Server 10 (IA32)	2.6.16.60-0.21-default	2.1.0.0
	2.6.16.60-0.21-smp	
	2.6.16.60-0.21-bigsmp	2.3.0.0 (*1)
	2.6.16.60-0.42.5-default	
2.6.16.60-0.42.5-smp		
SUSE LINUX Enterprise Server 10 (IPF)	2.6.16.60-0.42.5-bigsmp	2.3.0.0 (*1)
	2.6.16.60-0.42.5-xenpae	
	2.6.16.60-0.21-default	
	2.6.16.60-0.21-smp	2.1.0.0
SUSE LINUX Enterprise Server 10 (EM64T/AMD64)	2.6.16.60-0.21-default	2.1.0.0
	2.6.16.60-0.21-smp	
	2.6.16.60-0.42.5-default	2.3.0.0 (*1)
	2.6.16.60-0.42.5-smp	
2.6.16.60-0.42.5-xen		
SUSE LINUX Enterprise Server 11 (IA32)	2.6.27.21-0.1.2-default	2.1.0.0
	2.6.27.21-0.1.2-pae	
	2.6.32.12-0.7.1-default	2.3.0.0 (*1)
	2.6.32.12-0.7.1-pae	
2.6.32.12-0.7.1-xen		
SUSE LINUX Enterprise Server 11 (IPF)	2.6.27.21-0.1.2-default	2.1.0.0
	2.6.32.12-0.7.1-default	2.3.0.0 (*1)
SUSE LINUX Enterprise Server 11 (EM64T/AMD64)	2.6.27.21-0.1.2-default	2.1.0.0
	2.6.32.12-0.7.1-default	2.3.0.0 (*1)
	2.6.32.12-0.7.1-xen	

Note:

*1: Using an HDLM device as the boot disk is supported.

(4) HP

OS	Kernel	Driver
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (IA32)	2.6.18-274.el5 2.6.18-274.el5PAE	8.2.0.136
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (EM64T/AMD64)	2.6.18-274.el5	8.2.0.136

OS	Kernel	Driver
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (IA32)	2.6.18-308.el5 2.6.18-308.el5PAE	8.2.0.136
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (EM64T/AMD64)	2.6.18-308.el5	8.2.0.136
Red Hat Enterprise Linux 6.1 (EM64T/AMD64)	2.6.32-131.0.15.el6.x86_64	8.3.5.77.1p
Red Hat Enterprise Linux 6.2 (EM64T/AMD64)	2.6.32-220.el6.x86_64	8.3.5.77.1p

(5) Cisco

OS	Kernel	Driver
Red Hat Enterprise Linux 5.5 Advanced Platform/Red Hat Enterprise Linux 5.5 (EM64T/AMD64)	2.6.18-194.el5	1.5.0.1 (*1)
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (EM64T/AMD64)	2.6.18-238.el5	1.4.0.145 (*1) 1.5.0.1 (*1)
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (EM64T/AMD64)	2.6.18-274.el5	1.5.0.1 (*1) 1.5.0.20 (*1)
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (EM64T/AMD64)	2.6.18-308.el5	1.5.0.1 (*1)
Red Hat Enterprise Linux 5.9 Advanced Platform/Red Hat Enterprise Linux 5.9 (EM64T/AMD64)	2.6.18-348.el5	1.6.0.12 (*3)
Red Hat Enterprise Linux 6.0 (EM64T/AMD64)	2.6.32-71.el6.x86_64	1.5.0.1 (*1)
Red Hat Enterprise Linux 6.1 (EM64T/AMD64)	2.6.32-131.0.15.el6.x86_64	1.5.0.1 (*1)

Appendix A

OS	Kernel	Driver
Red Hat Enterprise Linux 6.2 (EM64T/AMD64)	2.6.32-220.el6.x86_64	1.5.0.1 (*1)
Red Hat Enterprise Linux 6.4 (EM64T/AMD64)	2.6.32-358.el6.x86_64	1.5.0.45 (*2)
Red Hat Enterprise Linux 6.5 EM64T/AMD64)	2.6.32-431.el6.x86_64	1.5.0.45

Note:

- *1: Only using an HDLM device as the boot disk is supported.
- *2: Using an HDLM device as the boot disk is not supported.
- *3: Using an HDLM device as the boot disk is supported.

Use the iSCSI connections given below. When using two or more adapters, use the same type of adapter. If you combine different types of HBA, HDLM may not be able to switch a path when an error occurs.

(1) Red Hat

OS	Kernel	Driver Type	Driver
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (IA32)	2.6.18-238.el5 2.6.18-238.el5PAE	iSCSI Initiator (*1)(*2)	Bundle(*3)
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (IPF)	2.6.18-238.el5	iSCSI Initiator (*1)(*2)	Bundle(*3)
Red Hat Enterprise Linux 5.6 Advanced Platform/Red Hat Enterprise Linux 5.6 (EM64T/AMD64)	2.6.18-238.el5	iSCSI Initiator (*1)(*2)	Bundle(*3)
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (IA32)	2.6.18-274.el5 2.6.18-274.el5PAE	iSCSI Initiator (*1)(*2)	Bundle(*3)
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (IPF)	2.6.18-274.el5	iSCSI Initiator (*1)(*2)	Bundle(*3)
Red Hat Enterprise Linux 5.7 Advanced Platform/Red Hat Enterprise Linux 5.7 (EM64T/AMD64)	2.6.18-274.el5	iSCSI Initiator (*1)(*2)	Bundle(*3)

OS	Kernel	Driver Type	Driver
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (IA32)	2.6.18-308.el5 2.6.18-308.el5PAE	iSCSI Initiator (*1)(*2)	Bundle(*3)
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (IPF)	2.6.18-308.el5	iSCSI Initiator (*1)(*2)	Bundle(*3)
Red Hat Enterprise Linux 5.8 Advanced Platform/Red Hat Enterprise Linux 5.8 (EM64T/AMD64)	2.6.18-308.el5	iSCSI Initiator (*1)(*2)	Bundle(*3)
Red Hat Enterprise Linux 5.9 Advanced Platform/Red Hat Enterprise Linux 5.9 (IA32)	2.6.18-348.el5 2.6.18-348.el5PAE	iSCSI Initiator (*1)(*2)	Bundle(*3)
Red Hat Enterprise Linux 5.9 Advanced Platform/Red Hat Enterprise Linux 5.9 (IPF)	2.6.18-348.el5	iSCSI Initiator (*1)(*2)	Bundle(*3)
Red Hat Enterprise Linux 5.9 Advanced Platform/Red Hat Enterprise Linux 5.9 (EM64T/AMD64)	2.6.18-348.el5	iSCSI Initiator (*1)(*2)	Bundle(*3)
Red Hat Enterprise Linux 6.1 (IA32)	2.6.32-131.0.15.el6.i686	iSCSI Initiator (*1)(*2)	Bundle(*3)
Red Hat Enterprise Linux 6.1 (EM64T/AMD64)	2.6.32-131.0.15.el6.x86_64	iSCSI Initiator (*1)(*2)	Bundle(*3)
Red Hat Enterprise Linux 6.2 (IA32)	2.6.32-220.el6.i686	iSCSI Initiator (*1)(*2)	Bundle
Red Hat Enterprise Linux 6.2 (EM64T/AMD64)	2.6.32-220.el6.x86_64	iSCSI Initiator (*1)(*2)	Bundle
Red Hat Enterprise Linux 6.3 (IA32)	2.6.32-279.el6.i686	iSCSI Initiator (*1)(*2)	Bundle(*3)
Red Hat Enterprise Linux 6.3 (EM64T/AMD64)	2.6.32-279.el6.x86_64	iSCSI Initiator (*1)(*2)	Bundle(*3)

Appendix A

OS	Kernel	Driver Type	Driver
Red Hat Enterprise Linux 6.4 (IA32)	2.6.32-358.el6.i686	iSCSI Initiator (*1)(*2)	Bundle(*3)
Red Hat Enterprise Linux 6.4 (EM64T/AMD64)	2.6.32-358.el6.x86_64	iSCSI Initiator (*1)(*2)	Bundle(*3)
Red Hat Enterprise Linux 7 (EM64T/AMD64)	3.10.0-123.el7.x86_64	iSCSI Initiator (*1)(*2)	Bundle(*3)

Note:

*1: 1GbE NIC is supported. 10GbE NIC is not supported.

*2: iSCSI HBA/CNA is not supported.

*3: Using an HDLM device as the boot disk is not supported.

(2) Emulex

OS	Kernel	Driver Type	Driver
Red Hat Enterprise Linux 6.2 (IA32)	2.6.32-220.el6.i686	iSCSI HBA/CAN	4.1.334.15 (*1)
			4.2.374.0 (*2)(*3)
Red Hat Enterprise Linux 6.2 (EM64T/AMD64)	2.6.32-220.el6.x86_64	iSCSI HBA/CNA	4.1.334.15 (*1)
			4.2.374.0 (*2)(*3)
Red Hat Enterprise Linux 6.4 (IA32)	2.6.32-358.el6.i686	iSCSI HBA/CAN	4.2.374.0 (*2)(*3)
Red Hat Enterprise Linux 6.4 (EM64T/AMD64)	2.6.32-358.el6.x86_64	iSCSI HBA/CNA	4.2.374.0 (*2)(*3)

Note:

*1: Using an HDLM device as the boot disk is not supported.

*2: Using an HDLM device as the boot disk is supported.

*3: CNA F/W 4.2.433.604 or later is required.

(3) Novell

OS	Kernel	Driver Type	Driver
SUSE LINUX Enterprise Server 11 (IA32)	2.6.27.21-0.1.2-default	iSCSI Initiator (*1)(*2)	Bundle(*3)
	2.6.27.21-0.1.2-pae		
	2.6.27.21-0.1.2-xen		
	2.6.32.12-0.7.1-default		
	2.6.32.12-0.7.1-pae		
	2.6.32.12-0.7.1-xen		
	3.0.13-0.27-default		
3.0.13-0.27-pae			
SUSE LINUX Enterprise Server 11 (IPF)	3.0.76-0.11-default	iSCSI Initiator (*1)(*2)	Bundle(*3)
	3.0.76-0.11-pae		
	2.6.27.21-0.1.2-default		
	2.6.32.12-0.7.1-default		
SUSE LINUX Enterprise Server 11 (EM64T/AMD64)	3.0.13-0.27-default	iSCSI Initiator (*1)(*2)	Bundle(*3)
	3.0.76-0.11-default		
	2.6.27.21-0.1.2-default		
	2.6.27.21-0.1.2-xen		
	2.6.32.12-0.7.1-default		
	2.6.32.12-0.7.1-xen		
	3.0.13-0.27-default		
3.0.76-0.11-default			
SUSE LINUX Enterprise Server 11 (EM64T/AMD64)	3.0.76-0.11-xen	iSCSI Initiator (*1)(*2)	Bundle(*3)
	2.6.27.21-0.1.2-default		
	2.6.32.12-0.7.1-default		

Note:

- *1: 1GbE NIC is supported. 10GbE NIC is not supported.
- *2: iSCSI HBA/CNA is not supported.
- *3: Using an HDLM device as the boot disk is not supported.

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