HITACHI Gigabit Fibre Channel Adapter INSTALLATION GUIDE (Oracle Linux driver Edition)

Revision 4.0 Aug. 2015 MK-99COM069-02

HITACHI

Read this manual well and keep it near the system so that you can refer to it as needed. Before starting operation, familiarize yourself with the safety instructions.

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Information

The BladeSymphony server name has been changed to Hitachi Compute Blade. If you are using BladeSymphony based server products, substitute references to Hitachi Compute Blade with BladeSymphony.

Important Notes

It is strictly forbidden to reprint or duplicate part or all of this manual without the permission of the publisher.

The contents of this manual are subject to change without notice.

Despite our meticulous care to ensure the accuracy of the contents, should you find any errors or questionable issues, or if you have opinions to share with us, please contact your dealer.

Note that we shall not be liable for the consequences of operating this product in ways not stated in this manual.

Reliability of the System Equipment

The system equipment you purchased is designed for general office work. Avoid using it for applications requiring high reliability that may seriously affect human life or property. We shall not assume any responsibility for any accidents resulting from such use of the product.

Examples of inappropriate applications of system equipment intended for general office work are:

• Control of a chemical plant, control of medical devices, and control of emergency communications, all of which require high reliability.

You need a different system for such high reliability applications. Please consult our sales department for the appropriate system.

Regulatory Compliance Notices

☐ Federal Communications Commission (FCC) Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at personal expense. The user is cautioned that changes or modifications not expressly approved by the manufacturer could void the user's right to operate the equipment.

EN55022 Compliance

Warning: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

□ Class A Emission Statement (Korea)

이 기기는 업무용(A급)으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

□ Canadian Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

□ Product recycling and disposal (EU and Norway) (Waste Electrical and Electronic Equipment Directive 2002/96/EC [WEEE])

The following mark on Products indicates that these Products are to be collected separately and to be recycled or discarded according to applicable local and national regulations. For further information regarding return, collection, recycle or disposal, please contact your sales company where you purchased the Products.



The above mark is not printed on the following Products but these Products are also subject to electrical and electronic equipment (EEE). These un-marked Products are, as well as marked Products, to be collected separately and to be recycled or discarded according to applicable local and national regulations. For further information, please contact your sales company where you purchased the Products.

No.	Products code	Products name
1	GVX-CC64G*BX, GVX-CC64G*	Fibre Channel Board
2	GVX-CC9FCCMB2BX, GVX-CC9FCCMB2	Combo Card For FCSW module
3	GVX-CC9IOCOMBBX, GVX-9IOCOMB	Combo Card For I/O module T3
4	GGX-CC9M4G2X1EX, GGX-CC9M4G2X1	FC mezzanine card

Note: The above regulation/marking applies only to countries within the European Union (EU) and Norway.

■ Export control

To export this product, check the export control-related regulations and follow the necessary procedures. If you have any questions, contact our sales representative.

Note that the same handling is required for peripheral equipment and pre-installed software shipped with this product.

Notes on Deleting Data when Disposing of or Transferring the System Equipment

Personal computers and system equipment are used for various purposes at the office and home. Important data of customers are recorded in the hard disks in these computers and system equipment.

You must erase these important data contents when transferring or disposing of the system equipment.

However, it is not easy to erase data written on the hard disk.

When you "erase data", you generally do one or more of the following:

Discard data in the "Recycle Bin".

"Delete" data.

Erase data using the "Empty Recycle Bin" command.

Perform initialization (formatting) of the hard disk using software utilities.

Recover the factory defaults using a recovery CD.

The above operations only change the file management information of data recorded on the hard disk; actually the data is just blocked from view.

That is, although the data appears to have been erased, it was just made unavailable under an operating system such as Windows. The actual data remains on the hard disk and may be read using special data recovery software. Consequently, important data on the hard disk of the system equipment can be read and used for unexpected applications by malicious people.

To avoid unauthorized access to important data on the hard disk when disposing of or transferring the system equipment, it is extremely important for you to erase all data recorded on the hard disk at your own risk. When you erase the data, we recommend that you purchase and use a dedicated software or service, or corrupt the data on the hard disk physically or magnetically using a hammer or strong magnet to make it unreadable.

Transferring the system equipment without deleting software on the hard disk (operating system, applications, etc.) may be against software licensing agreements. Check your software licensing agreements carefully.

Registered Trademarks and Trademarks

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All other registered trademarks or trademarks in this manual are the property of their respective owners

Introduction

Thank you for purchasing Hitachi Gigabit Fibre Channel Adapter. This manual describes procedures for the use of Hitachi Gigabit Fibre Channel Adapter such as installation, connection, and handling.

Notation

□ Symbols

Meanings of symbols used in this manual are as follows:

⚠ WARNING	This indicates the presence of a potential risk that might cause death or severe injury.
⚠ CAUTION	This indicates the presence of a potential risk that might cause relatively mild or moderate injury.
NOTICE	This indicates the presence of a potential risk that might cause damage to the equipment and/or damage to surrounding properties.
Note	This indicates notes not directly related to injury or severe damage to the equipment.
Tip	This indicates advice on how to make the best use of the equipment.

Abbreviations for Operating Systems (OS)

In this manual, the following abbreviations are used for OS name:

Oracle Linux 7 (Hereinafter, referred to as OEL7)

- Oracle Linux 6
 (Hereinafter, referred to as OEL6)
- Oracle Linux 5 (Hereinafter, referred to as OEL5)
- Unbreakable Enterprise Kernel (Hereinafter, referred to as UEK)
- Red Hat Enterprise Linux 7 Server (Hereinafter, referred to as Red Hat Enterprise Linux 7 or RHEL7)
- Red Hat Enterprise Linux 6 Server (Hereinafter, referred to as Red Hat Enterprise Linux 6 or RHEL6)
- Red Hat Enterprise Linux 5 Server (Hereinafter, referred to as Red Hat Enterprise Linux 5 or RHEL5)

Information on Support and Service

Missing Parts on Delivery

The product is checked by local support personnel when it is delivered.

In some cases, no checkout work is performed or no local support personnel visit you when the product is delivered. If you find any missing part or if you have any questions on the delivered product in such cases, contact your sales.

When You Need Help

- Refer to the manual.

 Refer to manuals. Also refer to other printed manuals provided with the product.
- 2 Contact us by phone.

Contact the reseller where you have purchased the product.

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Precautions for Safe Use

Notes related to safety issues are marked as shown below.



This is a safety alert symbol. It calls attention to a potential safety hazard to humans. In order to avoid possible injury or death, follow the message provided after this symbol.

⚠ WARNING

This symbol indicates the presence of a potential risk that might cause death or severe injury.

A CAUTION

This symbol indicates the presence of a potential risk that might cause relatively mild or moderate injury.

NOTICE

This symbol indicates the presence of a potential risk that might cause severe damage to the equipment and/or damage to surrounding properties.

A

This pictogram (\triangle) indicates a precaution. The figure inside the triangle (\triangle) indicates the type of hazard.

The example on the left indicates a shock hazard.

1

This pictogram (\circ) indicates an action that you must not take. The pictogram (\circ) is placed over a figure that depicts the "must-not" item involved.

The example on the left indicates "Do not disassemble".



This pictogram (\bullet) indicates an action to take. The figure inside the circle (\bullet) shows the action to take.

The example on the left tells you to "Unplug the power cord from the outlet".

Common precautions concerning safety

Please follow these safety instructions:

When operating the equipment, follow the instructions and procedures provided in the manual.

Be sure to follow notes, cautionary statements and advice indicated on the equipment or in the manual

Failure to follow those instructions may lead to injury, fire or damage to the equipment.

Operations and actions to perform

Do not perform operations or actions other than those described in the manual. Should you find any problem with the equipment, turn off the power, unplug the power cord from the electrical outlet, and then contact your dealer or call for maintenance personnel.

Pay attention

The equipment and the manual carry notes, cautionary statements and advice that have been fully examined and reviewed. However, unforeseeable situations may occur. When operating the equipment, always stay alert.

⚠ WARNING



Abnormal heat, smoke, abnormal noise, or abnormal smell

Should you find anything abnormal occurring, turn off the power and unplug all the power cords of the equipment (maximum of 5) from the electrical outlets. Using the power cord after such occurrences may lead to electric shock or fire. Do not place any objects around the electrical outlet to allow users to unplug the



Do not repair, remodel or disassemble

power cord immediately.

Do not attempt to repair, remodel or disassemble the equipment on your own, except for expansion work to be performed in accordance with the instructions in this manual. Work performed by unqualified persons may lead to electric shock, fire, or burns. There are many high-voltage areas inside the power unit. It might be hazardous if you touch these areas.



Insertion of foreign objects into the equipment

Do not allow clips, pins or any other metal items or flammable items to enter the equipment through a vent or by any other means. Continuing to operate the equipment with foreign objects may lead to electric shock or fire.



Removal of cover or bracket

Unless otherwise instructed, turn off the power, unplug all power cords of the equipment from the electrical outlets, and disconnect all cables from the equipment before removing covers or brackets. Even if you turn off the power to the equipment, some circuits are live and unexpected contact may cause a fire.

Do not use the equipment with the cover removed. It may also result in electric shock or equipment failure.



Handling of the power outlet

Use a grounding 2-pole plug-in power outlet. Outlets of any other types would cause electric shock or fire.

In order to prevent electric shock, use a ground wire to connect the outlet's grounding electrode to a ground terminal installed by a qualified electrician. Omission of this connecting step may cause electric shock in the event of a power failure.



Do not place objects on the equipment

Do not place a vase, potted plant or any other container with water in it or small metal items like pins and clips on the equipment. Operating the equipment with conductive objects such those mentioned above may lead to electric shock, smoke, or fire.



Handling of heavy loads

The equipment is heavy. Be careful when moving it. Otherwise, handling of this equipment may hurt your arms or lumbar.

To move or lift heavy loads such as this product, use tools or perform the task with the help of at least one other person. Otherwise handling of heavy loads could cause injury.



Handling of the power cables

Always use the power cables shipped with the equipment, and follow the instructions below: Failure to follow the correct handling practices may lead to damage to the power cables to expose the copper wires, or overheating due to short-circuiting or partial disconnection, which may cause electric shock or fire.

Do not place any object on the power cables.

Do not pull the cables.

Do not apply pressure on the power cables.

Do not fold the power cables.

Do not work upon the power cables.

Do not use the power cables near heatgenerating appliances.

Do not bundle the power cables.

Do not subject the power cables to ultraviolet or strong visible light continuously.

Do not use the power cables past their service life.

Do not expose the power cables to alkali, acid, fat and oil, or humidity.

Do not use the power cables in a high-temperature environment.

Do not use the power cables above their specified rating.

Do not use the power cables for other devices



Not designed to operate near volatile liquid

Do not use volatile liquids such as nail polish remover near the equipment. Such volatile liquids could cause a fire if they enter inside the equipment and are ignited.



Handling of the power plug

When inserting the power plug into the electrical outlet or removing it, be sure to hold the plug section. Do not pull the cable; it may partially break the wire, heat the broken part and lead to a fire.

If a long downtime is planned, remove the power plug from the outlet. The equipment is live even when not in use, and any damaged components may cause a fire.

Be sure to handle the power plug with dry hands when inserting or removing it from the outlet. Handling it with wet hands may cause an electric shock.



Impact from falling

Do not let the plug fall or hit it against another object. It may cause internal deformation and deterioration. Operating the equipment under such defective conditions may lead to electric shock or fire.



Applicable power source

The equipment uses 200 VAC. Do not operate the equipment with a voltage other than that specified. It may lead to internal breakage or electric shock or fire due to overheating and deterioration (depending on the voltage magnitude).

♠ WARNING



Contact failure and tracking of the power plug

Comply with the following instructions for handling of the power plug. Otherwise, tracking or contact failure may cause a fire.

Make sure that the power plug is fully and securely inserted into the electrical outlet.

Before inserting the power plug, check that there is no dust or water on the plug. If any dust or water is found, wipe it off with a dry cloth and then insert it.

Check that the outlet can firmly hold the plug.



Handling of batteries

The following actions must be avoided. Inappropriate handling may cause the battery to overheat, burst, and leak, resulting in injury, smoke or fire.

Disassembling the battery

Heating beyond 100°C

Incinerating

Wetting

Using batteries other than those specified



Storage location for batteries

Keep batteries out of the reach of young children. There is a danger that they might swallow them. Should a battery ever be swallowed, take care to secure a breathing path for the child and immediately call for medical assistance.



Disposal of batteries

To dispose of batteries, consult your dealer or follow the relevant regulations and rules of your country.



Storing batteries

When storing batteries, apply adhesive tape on the terminals for insulation. If the batteries are stored without insulation, the terminals can contact each other to cause a short-circuit and overheat or burst, leading to injury or fire.



Multiple connections to a single outlet not allowed

Do not connect multiple power cables to a single electrical outlet. Overheating of the power cables or outlet may cause fire and trip the circuit breaker, stopping the operation of other devices on the same circuit.



Not designed to operate in a humid or dusty environment

Do not use the equipment near a place where water is used such as sink, in a humid basement, or in a dusty place. Such conditions may lower electric insulation, leading to electric shock or fire.



Not designed to operate in a high-temperature environment

Do not install the equipment in a place subject to high temperatures and do not cover it with insulating material. It may cause a fire.



Moving between two locations with a significant temperature gap

When you move the equipment from one location to another, a significant temperature gap between the two locations may cause condensation on the surface or inside the equipment. Using the equipment when condensation is present may lead to electric shock or fire. Leave the equipment at the new location for several hours before you start using it.



Addition and connection of peripheral devices or optional components

To add or connect peripheral devices or optional components to the equipment, remove the power plug from the outlet and disconnect all cables from the equipment unless otherwise instructed. Use only peripheral devices and optional components which are explicitly listed as supported devices in the manual, and always follow the instructions in the manual.

Using devices other than those mentioned above would cause a failure of the peripheral devices or optional components, smoke, or fire due to the difference in connection specifications.



Vents

Vents on the equipment aim to prevent internal temperature rise. Do not block the vents by placing any objects in front of or against them. Otherwise the internal temperature may rise, leading to smoke, fire or failure.

Keep vents clear of dust by periodically checking and cleaning them.



Plastic bags for packaging

To avoid the risk of suffocation, do not leave plastic bags (such as air bubble cushioning for packaging) within the reach of young children.



Handling the power supply module

The power supply module has a high-voltage area in it. Do not open the cover. It may result in electric shock or equipment failure.



Handling of the product

Install the product on a fixed rack. Do not lean against the product or stand on it. Do not install the product in a place with weak floors and walls.

Do not subject the product to excessive vibration. It could fall and cause a failure.

↑ CAUTION



Contact with contact pins

Do not touch the contact pins of connectors with your hand or any metal item. Do not any objects such as wire among the pins. Do not place the equipment in a place where there are metal pieces. Otherwise, contact failure may cause a malfunction.

When you have to touch the card, take care not to hurt yourself. You can wear cotton gloves.



Addition and replacement of parts in the equipment

Increasing the number of built-in options for a system device or replacing them must be entirely conducted by maintenance personnel. Avoid removing the cover from the device and avoid installing or removing built-in options. The system device contains parts mounted at high density, which suggests that unskilled work will lead to injury or device failure. If you need to add or replace options, you should contact your dealer or call the maintenance personnel.



Contact with metal edges

When moving the equipment or adding parts, take care not to hurt yourself on the metal or plastic edges. You can wear cotton gloves.



Using at an unstable place

Do not place the equipment on an inclined ground or at a narrow or unstable place. The equipment may fall and cause an injury.



Use for purposes other than the stated purpose

Do not use the equipment for any other purpose other than its intended use. It may malfunction or fall and cause an injury.



Consumables

Only use specified consumables. Using consumables other than those specified may not only reduce reliability of the product but also cause malfunction, electric shock or fire.



Eve fatique

Provide luminance of 300 to 1000 lux for viewing the display. Take a break of 10 to 15 minute every hour. Viewing the display for a long time results in eye fatigue.



Cover for the power supply module

The power supply module, and its cover and handle are heated while that module is run. Take care when replacing a failed module or in other cases. You might get burned.



Laser beam

On this product, a Class 1 laser product is installed. Do not look directly at the laser beam. Do not look at the laser beam using an optical device.

Under the laser module cover, a laser beam is being emitted. Do not remove the cover of an unused board.

↑ CAUTION



Signal cables

When wiring cables, take care not to trip over the cables. It could cause injury or failure of devices connected to the equipment. It could also cause loss of valuable data

Do not place heavy items on the cables. Avoid wiring cables close to a thermal appliance. It may cause damage to cable sheaths, resulting in failure of the connected devices.



Improper battery type

Improper type of battery used can cause explosion.

Replace the battery with a proper one as recommended by the manufacturer. Dispose of the worn-out battery according to the manufacturer's instructions.



Aluminum electrolytic capacitors

An aluminum electrolytic capacitor has a limited service life. Do not use it past its service life. Otherwise, leakage or depletion of the electrolyte may cause smoke or electric shock. To avoid such hazardous situations, replace limited-life parts once they are past their designated service life



Handling of the system equipment

Addition or replacement of optional components must be performed by maintenance personnel.

Do not attempt to remove the cover of the equipment. Do not attempt to install or remove optional components. Parts implemented in the system equipment are high-density, and highly complex. Operation or maintenance by inexperienced persons may lead to injury or equipment failure.

When you need to add or replace optional components, contact your dealer or call maintenance personnel.



Installing the equipment onto a rack

To mount or remove the system equipment onto or from the rack cabinet, do not strain yourself to do so alone. Instead, always get help from at least one other person or use tools. If the system equipment has to be mounted on 31U and above of the rack cabinet or it is already mounted there, do not attempt to mount or remove it. Call maintenance personnel.

Defective mounting may cause the system equipment to fall, resulting in an injury or equipment failure.

To perform any operation with the equipment pulled out from the rack cabinet, be sure to mount a stabilizer to the rack cabinet. Applying excessive force could cause the rack cabinet to fall, resulting in an injury or equipment failure. If a stabilizer is not mounted, call maintenance personnel.



High Temperature at the 10GBASE-R Transceiver

The 10GBASE-R transceiver in the 10Gbps LAN switch module increases in temperature during operation. To remove the transceiver, therefore, allow at least approximately 5 minutes after the power supply for the 10Gbps LAN switch module is stopped from the management module. Failure to do so may cause you to get burned.

NOTICE



Backing up data

Always create backup copies of important data on the hard disk to auxiliary storage. If the hard disk fails, all data stored on it will be lost.



Not designed to operate outdoors

Do not operate the equipment outdoors. It could cause a failure.



Disposal of the equipment

For disposal by a business operator

Check the industrial waste disposal regulations for your country and follow the necessary procedures.

For disposal by an individual

To dispose of this equipment, consult your dealer or follow the relevant regulations.



Radio interference

When installed next to other electronic equipment, the equipment may interfere with each other. In particular, with a television set or a radio in the vicinity, some noise may occur on the equipment. If this happens, do the following:

Place the equipment as far away as possible from the TV or radio.

Change the orientation of the antenna of the TV or radio.

Plug the electronic equipment into separate electrical outlets.



Anti-earthquake measures

Strong vibration such as that generated by an earthquake could cause the equipment to move and fall, resulting in serious accidents.

In order to prevent disastrous outcomes, consult a maintenance company or an expert business for developing counter-seismic measures and implement them accordingly.



Handling the hard disk

The hard disk is a precision instrument. Handle it carefully when you use it. Inappropriate handling may result in hard disk failure.

When carrying the system equipment or hard disk, handle it carefully and do not vibrate or hit it. Before handling the hard disk, remove static electricity or wear cotton gloves.

Before moving the system equipment, turn off the power, remove the power plug from the electrical outlet, and wait at least 30 seconds.



Rat control

Rats can cause the following damage to a computer system:

Breakage of cable sheaths

Corrosion, contact failure, or soiled parts inside the equipment

In order to prevent the above damage, consult a maintenance company or an expert business for developing rat control measures and implement them accordingly.

NOTICE



Implementing a disk array

You must not change the disk array during system operations. Otherwise, the system would lose all data.

If you select [New Configuration], the hard disk will lose all data.



Power operation

Follow the prescribed procedure for power operation. Power input or output not according to the prescribed procedure may cause problems to the system equipment.



Faulty disk

If you attempt to replace a faulty disk using an incorrect procedure, data on the disk may be corrupted. Before starting disk replacement work, back up the data.

Replacing a hard disk without failure will corrupt the data on it. Do not remove any hard disk other than the faulty disk.



Connecting a cable to the management module

When you connect the management module over a network, the system will incur an error if a device assigned with the same IP address as for the BMC on the management module or server blade exists on the network.

After the end of a network configuration, connect a cable to the management module.



N + M cold standby function

When the N+M cold standby function is enabled, Pre-configuration is automatically executed and the status LED (CND) on the server blade lights solid green after the POWER LED on the front panel lights solid orange. Confirm that the POWER LED of the front panel lights solid orange to show Pre-configuration is completed before executing step 3 described above.

Make sure to use the same LPAR manager firmware version as the active partition for the standby partition. Otherwise, N+M failover may fail.

Do not move the EFI Shell to the highest booting priority in the EFI Setup menu. If the EFI Shell is on the top of the boot option, the OS will not successfully boot after N+M switching and failback.

For a Xeon server blade, executing the Pre-configure automatically changes the SAN booting priority to the lowest of the priority settings.

If you change the LPAR configuration (processors, memory, or device assignment), make sure to implement [F9]: "Save Configuration" on the LPAR manager Menu screen. For details, refer to "Saving Settings on the LPAR manager Screen".

When a switching alert is issued by the BSM command execution, the active partition is forcibly powered off.

First Aid for Electric Shock

First aid is the help you can provide before you can get professional medical help. For serious conditions, it is vitally important to take the victim to a doctor as soon as possible. Have someone call an ambulance at once while you apply first aid.

Break the victim's contact with the source of electricity in the quickest safe way possible. Turn off the main switch of the power distribution panel immediately and ground the circuits. Remove the victim from contact with the current, using a dry wooden pole, a dry rope or dry clothing. Do not touch the victim before contact with the current is broken.

Warning labels

Warning labels can be found at the following locations on the system equipment.

<Hitachi Compute Blade system equipment>

Install driver on Linux

This chapter describes how to install, update and roll back the driver on Linux.

Precautions

Before installation, be sure to confirm the supported kernel version. Check your linux kernel version by typing,

uname -r

Hitachi Gigabit Fibre Channel Adapter is supported below kernel versions.

```
Oracle Linux5
x86_64
2.6.39-200.31.1.el5uek

Oracle Linux6
x86_64
2.6.39-200.31.1.el6uek.x86_64
3.8.13-16.*.*.el6uek.x86_64

Oracle Linux7
x86_64
3.8.13-55.*.*.el7uek.x86_64
```

Install driver to SAN with Hitachi Gigabit Fibre Channel Adapter

Please install the OS to SAN using the following procedure.

OEL5

(1) Make hfcldd driver media

Please use HITACHI Gigabit Fibre Channel Adapter RHEL5 driver to install OEL5.8. When you install OEL5.8 with OEL5.8 installer, the Red Hat compatible kernel is used.

Please get seven files in the following directory of CD-ROM media included this product, and copy them to CD-ROM.

/hfc media/linux/x86 64/rhel5/fd media/2.6.18-308.el5

- (2) Insert the "OEL5 installation media" in USB DVD-ROM drive, and turn on the power supply of the blade.
- (3) Confirm whether HBA BIOS is enabled. When HBA BIOS is enabled, LUN for the installation is recognized and the following screens are displayed.

Refer to Hitachi Gigabit Fibre Channel Adapter User's Guide (Utility Software Edition) for the procedure how to set HBA BIOS to enable when it is disabled.

```
Hitachi Fibre Channel Adapter ROM BIOS Version 10.00.05.03
Copyright(C) HITACHI,Ltd 2004,2011. All rights reserved.

Press (Ctrl-R> to Enter BIOS

HBA# : D-ID : WWPN : LUN : Manufact : Product
HBA#00 020000 50060E80 1026E894 0000 HITACHI DF600F

HBA#01-06: BIOS is Disable

HBA BIOS Installed!
```

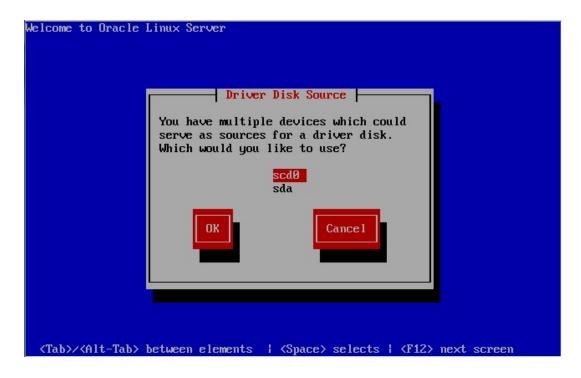
(4) The screen of "Oracle Linux" is output. Please add "linux dd vesa" and push the Enter key.



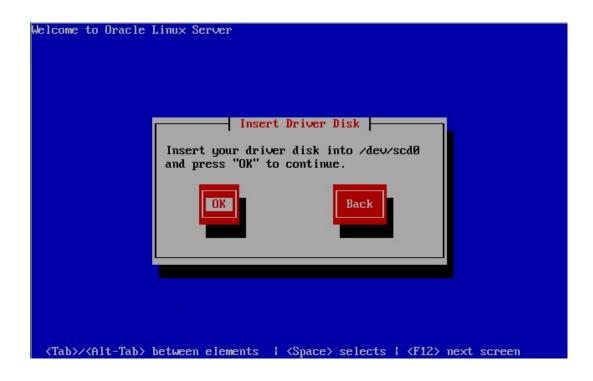
(5) When "Do you have a driver disk?" message is displayed, select "yes".



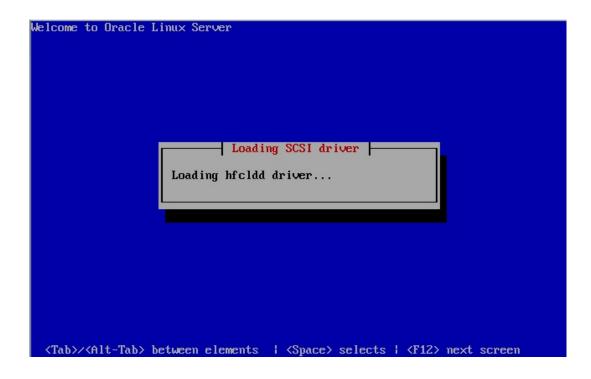
(6) When "Driver Disk Source" message is displayed, please select a USB DVD-ROM drive(Ex: scd0) and push the Enter key. This screen may not be displayed by a recognition of SCSI devices.



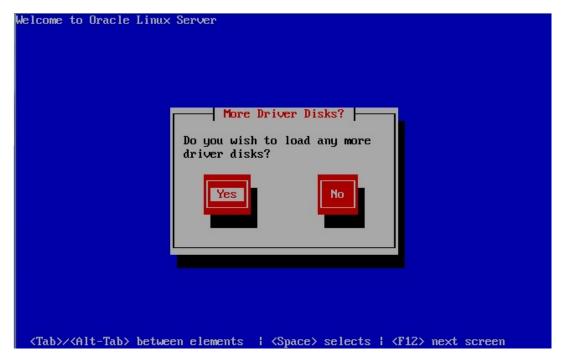
(7) When "Insert Driver Disk" message is displayed, change "OEL5 installation media" for the hfcldd driver disk made by (1), and select "OK".



(8) The messages of "Loading SCSI driver" is output and the HBA driver is read. When the message appears, the driver is successfully read. When the message doesn't appear, please check if the hfcldd driver media can be successfully created.



(9) When "More Driver Disks?" message is output, change the hfcldd driver disk for "OEL5 installation media", and select "NO"



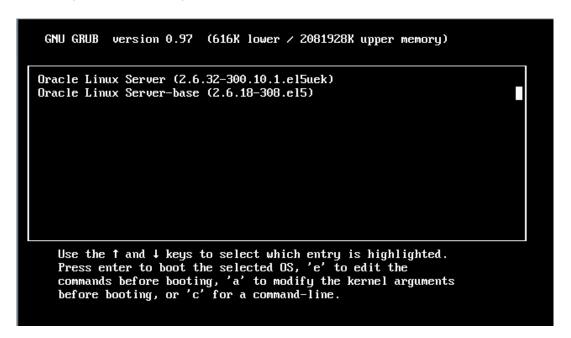
(10) When "CD Found "message is output, select "Skip".



- (11) The following screen is displayed, and the installation of Oracle Linux is begun.
- (12) Please install it according to the installation manual of Oracle Linux.



(13) After OS rebooted, please screen GRUB menu and select the Red Hat compatible kernel(ex: 2.6.18-308.el5) in GRUB menu.



(14) Please install UEK after booting OS.

Example:

rpm -ivh -force kernel-uek-2.6.39-200.31.1.el5uek.x86_64.rpm kernel-uek-firmware-2.6.39-200.31.1.el5uek.noarch.rpm

Please continue "Driver installation for UEK".

OEL6

Below is an installation example of OEL6.2.

(1) Make hfcldd driver media

Please use HITACHI Gigabit Fibre Channel Adapter RHEL6 driver to install OEL6.5. When you install OEL6.5 with OEL6.5 installer, the Red Hat compatible kernel is used.

Please get the image file "dd.iso" in the following directory of CD-ROM media included this product or from Hitachi web site. Image file is ISO format. Write the image to CD-R to using the appropriate writing software.

/hfc_media/linux/x86_64/rhel6/cd_media/2.6.32-220.el6

- (2) Insert the "OEL6 installation media" in USB DVD-ROM drive, and turn on the power supply of the blade.
- (3) Confirm whether HBA BIOS is enabled. When HBA BIOS is enabled, LUN for the installation is recognized and the following screens are displayed.

Refer to Hitachi Gigabit Fibre Channel Adapter User's Guide (Utility Software Edition) for the procedure how to set HBA BIOS to enable when it is disabled.

```
Hitachi Fibre Channel Adapter ROM BIOS Version 10.00.05.03
Copyright(C) HITACHI,Ltd 2004,2011. All rights reserved.

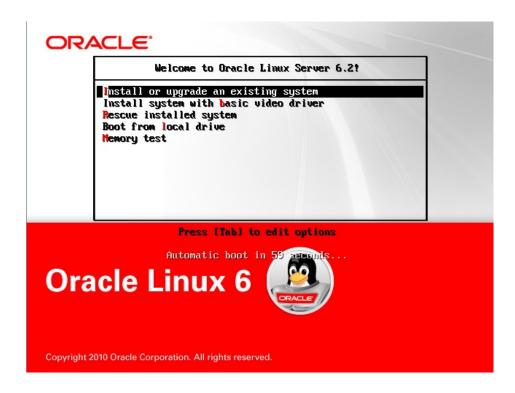
Press <Ctrl-R> to Enter BIOS

HBA# : D-ID : WWPN : LUN : Manufact : Product
HBA#00 020000 50060E80 1026E894 0000 HITACHI DF600F

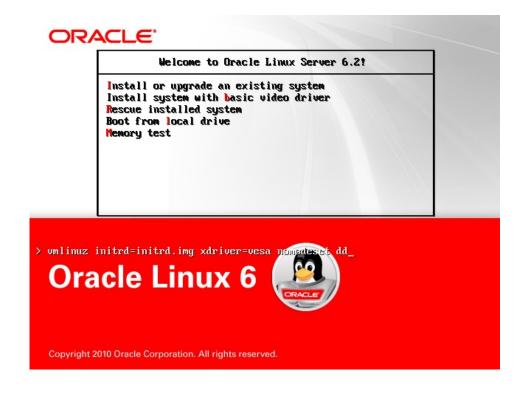
HBA#01-06: BIOS is Disable

HBA BIOS Installed!
```

(4) The screen of "Welcome to Oracle Linux Server 6" is output. Please select "Install system with basic video drive" and push the Tab key.



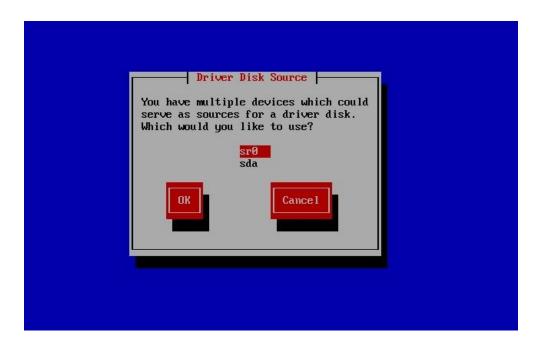
(5) The command "> vmlinuz initrd=initrd.img xdriver=vesa nomodeset" is displayed. Please add "dd" and push the Enter key.



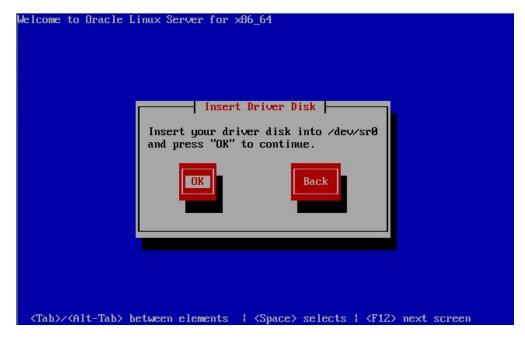
(6) When "Do you have a driver disk?" message is displayed, select "yes".



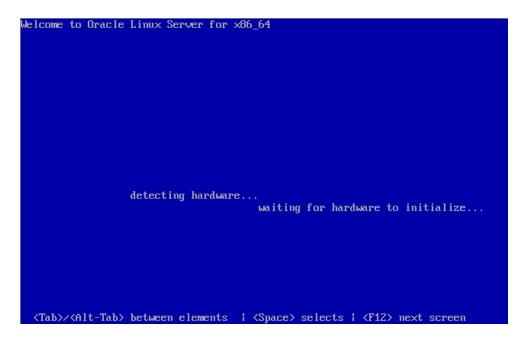
(7) When "Driver Disk Source" message is displayed, please select a USB DVD-ROM drive(Ex: sr0) and push the Enter key. This screen may not be displayed by a recognition of SCSI devices.



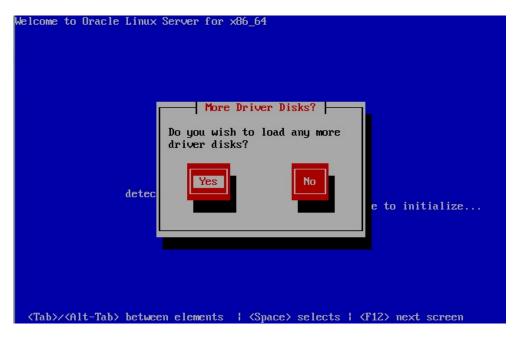
(8) When "Insert Driver Disk" message is displayed, change "OEL6 installation media" for the hfcldd driver disk, and select "OK".



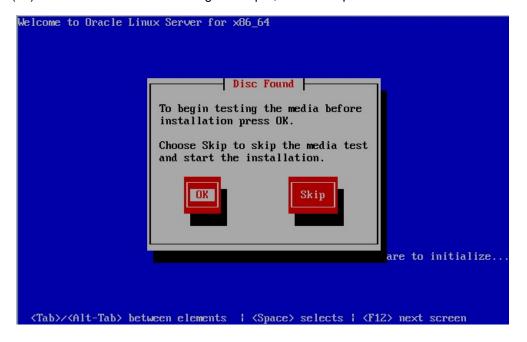
(9) After this, the messages of "detecting hardware..." and "waiting for hardware to initialize..." are output and the HBA driver is read. When the message appears, the driver is successfully read. When the message doesn't appear, please check if the hfcldd driver media can be successfully created.



(10) When "More Driver Disks?" message is output, change the hfcldd driver disk for "OEL6 installation media", and select "NO"



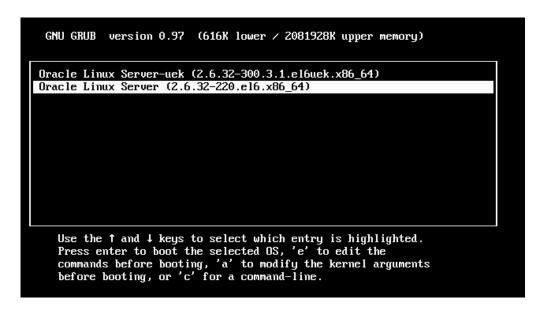
(11) When "Disc Found "message is output, select "Skip".



- (12) The following screen is displayed, and the installation of Oracle Linux is begun.
- (13) Please install it according to the installation manual of Oracle Linux.



(14) After OS rebooted, please screen GRUB menu and select the Red Hat compatible kernel(ex: 2.6.32-220.el5) in GRUB menu.



(15) Please install UEK after booting OS.

Example:

rpm -ivh –force kernel-uek-2.6.39-200.31.1.el6uek.x86_64.rpm kernel-uek-firmware-2.6.39-200.31.1.el6uek.noarch.rpm

Please continue "Driver installation for UEK".

OEL7

Below is an installation example of OEL7.1.

(1) Make hfcldd driver media

Please use "Driver & Utility CD for Red Hat Enterprise Linux 7" or "HITACHI Gigabit Fibre Channel Adapter RHEL7 driver" to install OEL7.1. When you install OEL7.1 with OEL7.1 installer, the Red Hat compatible kernel is used.

When you use "HITACHI Gigabit Fibre Channel Adapter RHEL7 driver", please get the image file "dd.iso" in the following directory of CD-ROM media included this product or from Hitachi web site. Image file is ISO format. Write the image to CD-R to using the appropriate writing software.

/hfc_media/linux/x86_64/rhel7/cd_media/3.10.0-229.el7

- (2) Insert the "OEL6 installation media" in USB DVD-ROM drive, and turn on the power supply of the blade.
- (3) Confirm whether HBA BIOS is enabled. When HBA BIOS is enabled, LUN for the installation is recognized and the following screens are displayed.

Refer to Hitachi Gigabit Fibre Channel Adapter User's Guide (Utility Software Edition) for the procedure how to set HBA BIOS to enable when it is disabled.

```
Hitachi Fibre Channel Adapter ROM BIOS Version 10.00.05.03
Copyright(C) HITACHI,Ltd 2004,2011. All rights reserved.

Press (Ctrl-R) to Enter BIOS

HBA# : D-ID : WWPN : LUN : Manufact : Product
HBA#00 020000 50060E80 1026E894 0000 HITACHI DF600F

HBA#01-06: BIOS is Disable

HBA BIOS Installed!
```

(4) The screen of "Install Oracle Linux 7.1" is displayed. Please select "Install Oracle Linux 7.1" and push the "e" key.



(5) The edit screen is displayed.

Please add "inst.dd" at the end of the line that contains "linuxefi" and push "Ctrl-x" key.

```
setparams 'Install Oracle Linux 7.1'

linuxefi /images/pxeboot/vmlinuz inst.stage2=hd:LABEL=OL-7.1\x20Server.x86_64 quiet inst.d\
d_
initrdefi /images/pxeboot/initrd.img

Press Ctrl-x to start, Ctrl-c for a command prompt or Escape to discard edits and return to the menu. Pressing Tab lists possible completions.
```

(6) When "Driver disk device selection" message is displayed, replace OEL7 installation media with "Driver & Utility CD for Red Hat Enterprise Linux 7" and press "r" key and the Enter key.

```
[ 4.733621] ERST: Can not request iomen region <0x 792b7000-0x
[ 5.899563] i8042: No controller found
[ 10.104272] negasas: IDC Init cnd success
[ 10.23473] negasas: INIT adapter done
DD: Checking devices

Page 1 of 1
Driver disk device selection
DEVICE TYPE LABEL UUID
[ 1) sr0 is09660 OL-7.1 Server.x86_64 2015-03-11-14-13-39-00

# to select, 'r'-refresh, 'n'-next page, 'p'-previous page or 'c'-continue: _
```

(7) When ISO image with "CDROM" label is displayed, please enter the number "1" and press the Enter key.

(8) When "Select drivers to install" message is displayed, please enter the number "1" and press the Enter key.

```
4.736483] ERST: Can not request iomem region (0x 792ba000-0x
5.902314] i8042: No controller found
1 0.112019] negasas: IDC init cmd success
1 10.218204] negasas: INIT adapter done
DD: Checking devices

Rage 1 of 1
Driver disk device selection
DEVICE TYPE LABEL UUID
1) sr0 iso9660 UL-7.1 Server.x86_64 2015-03-11-14-13-39-00

# to select, 'r'-refresh, 'n'-next page, 'p'-previous page or 'c'-continue: r

Page 1 of 1
Driver disk device selection
DEVICE TYPE LABEL UUID
1) sr0 iso9660 CDROM 2015-06-04-20-11-31-00

# to select, 'r'-refresh, 'n'-next page, 'p'-previous page or 'c'-continue: 1
DD: Checking device /dev/sr0
DD: Checking device /dev/sr0
DD: Processing DD repo /media/DD//rpms/x86_64 on /dev/sr0

Page 1 of 1
Select drivers to install
1) [ ] /media/DD//rpms/x86_64/kmod-hfcldd-4.7.18.3130-1.el7.x86_64.rpm

# to toggle selection, 'n'-next page, 'p'-previous page or 'c'-continue: 1
```

(9) Check if the "[x]" is displayed at the left side of the line that contains "kmod-hfcldd" and enter "c" key and press the Enter key.

```
4.736483] ERST: Can not request ionem region <0x
5.992314] i8042: No controller found
1 10.112019] negasas: INIT adapter done
DD: Checking devices

Page 1 of 1
Driver disk device selection
DEVICE TYPE LABEL UUID
1) sr0 iso9660 UL-7.1 Server.x86_64 2015-03-11-14-13-39-00

### to toggle selection
DEVICE TYPE LABEL UUID
1) sr0 iso9660 UL-7.1 Server.x86_64 2015-03-11-14-13-39-00

### to toggle selection
DEVICE TYPE LABEL UUID
1) sr0 iso9660 CDROM 2015-06-04-20-11-31-00

### to toggle selection, 'n'-next page, 'p'-previous page or 'c'-continue: 1
DD: Checking device /dev/sr0
DD: Checking device /dev/sr0

### to toggle selection, 'n'-next page, 'p'-previous page or 'c'-continue: 1
Page 1 of 1
Select drivers to install
1) [1 /media/DD//rpms/x86_64/kmod-hfcldd-4.7.18.3130-1.el7.x86_64.rpm

### to toggle selection, 'n'-next page, 'p'-previous page or 'c'-continue: 1
Page 1 of 1
Select drivers to install
1) [x] /media/DD//rpms/x86_64/kmod-hfcldd-4.7.18.3130-1.el7.x86_64.rpm

#### to toggle selection, 'n'-next page, 'p'-previous page or 'c'-continue: c_
```

(10) When "DD: Extracting files ..." message is displayed, change "Driver & Utility CD for Red Hat Enterprise Linux 7" for OEL7 installation media, and enter "r" key and press the Enter key.

(11) Check if the line contains "OL-7.1" is displayed, enter "c" key and press the Enter key.

```
5.9023141 i8042: No controller found
10.1120191 megasas:IOC Init cmd success
10.2182041 megasas: INIT adapter done
Checking devices
age 1 of 1
river disk device selection
DEVICE TYPE
1) sr0 iso9660
                                                           LABEL UUID
OL-7.1 Server.x86_64 2015-03-11-14-13-39-00
 to select, 'r'-refresh, 'n'-next page, 'p'-previous page or 'c'-continue: r
age 1 of 1
Priver disk device selection
DEVICE TYPE
1) sr0 iso9660
                                                                                    UUID
2015-06-04-20-11-31-00
 to select, 'r'-refresh, 'n'-next page, 'p'-previous page or 'c'-continue: 1
D: Checking device /dev/sr0
D: Processing DD repo /media/DD//rpms/x86_64 on /dev/sr0
 age 1 of 1
elect drivers to install
1) [ ] /media/DD//rpms/x86_64/kmod-hfcldd-4.7.18.3130-1.el7.x86_64.rpm
 to toggle selection, 'n'-next page, 'p'-previous page or 'c'-continue: 1
age 1 of 1
elect drivers to install
1) [x] /media/DD//rpms/x86_64/kmod-hfcldd-4.7.18.3130-1.el7.x86_64.rpm
 to toggle selection, 'n'-next page, 'p'-previous page or 'c'-continue: c
D: Extracting files from /media/DD//rpms/x86_64/kmod-hfcldd-4.7.18.3130-1.el7.x86_64.rpm
age 1 of 1
river disk device selection
DEVICE TYPE
1) sr0 iso9660
                                                           LABEL
CDROM
                                                                                    UUID
2015-06-04-20-11-31-00
 to select, 'r'-refresh, 'n'-next page, 'p'-previous page or 'c'-continue: r
age 1 of 1
river disk device selection
DEVICE TYPE
1) sr0 iso9660
                                                           LABEL UUID 0L-7.1 Server.x86_64 2015-03-11-14-13-39-00
```

- (12) Please install it according to the installation manual of Oracle Linux.
- (13) After OS rebooted, please screen GRUB menu and select the Red Hat compatible kernel in GRUB menu.

Please continue "Driver installation for UEK".

Driver installation for UEK

Installing OEL5 driver

(1) Get driver install package from CD-ROM

The installation files are stored in the following directories.

/hfc_media/linux/x86_64/oel5uek

Copy them according to the following procedure.

RPM Package Name:

1	hfcldd- <driver version="">-<release version="">.<kernel version="">. <machine type="">.rpm</machine></kernel></release></driver>	Device driver
2	hfcldd-tools- <driver version="">-<release version="">.<kernel version="">. <machine type="">.rpm</machine></kernel></release></driver>	Utility software

mount /dev/cdrom /media

cp /media/hfc_media/linux/x86_64/oel5uek/*.rpm /tmp/.

Note) Kernel version in RPM package name shows the kernel version when driver is built. It does not show supported kernel version.

(2) Confirm /etc/modprobe.conf

cat /etc/modules.conf

If "alias scsi_hostadapterX hfcldd_conf" and "alias scsi_hostadapterY hfcldd" lines are commented out, please release them.

(3) install the hfcldd RPM package

Please install two RPM packages according to the following procedures.

cd /tmp

rpm -ivh --force hfcldd-4.35.17.2152-1.2.6.39_200.31.1.el5uek.x86_64.rpm hfcldd-tools-4.35.17.2152-1.2.6.39_200.31.1.el5uek.x86_64.rpm

Note 1) Type 'su' to root before installation.

Note 2) When you install two RPM packages by one line, the order is arbitrary. For instance, if you specify package name with the following order,

rpm -ivh --force hfcldd-4.35.17.2152-1.2.6.39_200.31.1.el5uek.x86_64.rpm hfcldd-tools-4.35.17.2152-1.2.6.39_200.31.1.el5uek.x86_64.rpm

You can successfully install driver since the installation order is protected.

However, be sure to install hfcldd driver package before installing tool package when you install these packages separately.

```
# rpm -ivh --force hfcldd-4.35.17.2152-1.2.6.39_200.31.1.el5uek.x86_64.rpm # rpm -ivh --force hfcldd-tools-4.35.17.2152-1.2.6.39_200.31.1.el5uek.x86_64.rpm
```

Note 3) This rpm command updates kernel ramdisk image.

Note 4) Utility software is stored in /opt/Hitachi/drivers/hba.

Note 5) Do not specify –U or –F option when execute rpm command. Specifying these options cause unloading driver to the current running kernel. It may cause system hung-up or break the system

(4) Confirm Install log

The installation log is stored in /tmp/hfcldd_install.log.

Confirm the message "---- Install Success" is displayed.

```
# less hfcldd_install.log
Boot directory: boot
Configulation file: modprobe.conf
Kernel version: 2.6.39-200.31.1.el5uek
Host Type: x86_64
---- Install @Hitachi Fibre Channel Adapter Driver - Tue Nov 6 15:26:55 JST 2012
hraslog.ko is not installed
Modify /etc/modprobe.conf: old file is /etc/modprobe.conf.backup
---- Install Success
```

(5) Confirm /etc/modprobe.conf

Be sure that the following lines are added to /etc/modprobe.conf.

```
alias scsi_hostadapterX hfcldd_conf
alias scsi_hostadapterX+1 hfcldd
(X:0,1,2...)
(Note)
```

Please renumber scsi_hostadapter X for hfcldd and hfcldd_conf not to overlap with other scsi_hostadapter numbers. Scsi_hostateper X for hfcldd_conf should be smaller than hfcldd. If you renumber scsi_hostadapter, you need to update kernel RAMDISK image according to the "Update RAMDISK image".

(6) Reboot the system

Please reboot to load a new driver.

reboot

Installing OEL6 driver

(1) Get driver install package from CD-ROM or Hitachi web site.

The installation files are stored in the following directories.

/hfc media/linux/x86 64/oel6uek3

Copy them according to the following procedure.

RPM Package Name:

1	hfcldd- <driver version="">-<release version="">.3.8.13_16.2.1.el6uek. <machine type="">.rpm</machine></release></driver>	Device driver
2	hfcldd-tools- <driver version="">-<release version="">.3.8.13_16.2.1.el6uek. <machine type="">.rpm</machine></release></driver>	Utility software

mount /dev/cdrom /media

cp /media/hfc_media/linux/x86_64/oel6uek3/*.rpm /tmp/.

(2) install the hfcldd RPM package

Please install two RPM packages according to the following procedures.

cd /tmp

rpm -ivh --force hfcldd-4.36.18.3062-1.3.8.13_16.2.1.el6uek.x86_64.rpm hfcldd-tools-4.36.18.3062-1.3.8.13_16.2.1.el6uek.x86_64.rpm

Note 1) Type 'su' to root before installation.

Note 2) When you install two RPM packages by one line, the order is arbitrary. For instance, if you specify package name with the following order,

```
# rpm -ivh --force hfcldd-4.36.18.3062-1.3.8.13_16.2.1.el6uek.x86_64.rpm hfcldd-tools-4.36.18.3062-1.3.8.13_16.2.1.el6uek.x86_64.rpm
```

You can successfully install driver since the installation order is protected.

However, be sure to install hfcldd driver package before installing tool package when you install these packages separately.

```
# rpm -ivh --force hfcldd-4.36.18.3062-1.3.8.13_16.2.1.el6uek.x86_64.rpm  
# rpm -ivh --force hfcldd-tools-4.36.18.3062-1.3.8.13_16.2.1.el6uek.x86_64.rpm
```

- Note 3) This rpm command updates kernel ramdisk image.
- Note 4) Utility software is stored in /opt/hitachi/drivers/hba.
- Note 5) Do not specify –U or –F option when execute rpm command. Specifying these options cause unloading driver to the current running kernel. It may cause system hung-up or break the system

(3) Confirm Install log

The version.txt is stored in /opt/hitachi/drivers/hba Confirm the message "Version 4.36.18.****" is displayed.

more version.txt

* Version 4.36.18.3062 Tue Mar 24 2015

(4) Reboot the system

Please reboot to load a new driver.

reboot

Installing OEL7 driver

(1) Get driver install package from CD-ROM or Hitachi web site.

The installation files are stored in the following directories.

/hfc media/linux/x86 64/oel7uek3

Copy them according to the following procedure.

RPM Package Name:

1	hfcldd- <driver version="">-<release version="">.3.8.13-55.1.6.el7uek. <machine type="">.rpm</machine></release></driver>	Device driver
2	hfcldd-tools- <driver version="">-<release version="">.3.8.13-55.1.6.el7uek.<machine type="">.rpm</machine></release></driver>	Utility software

mount /dev/cdrom /media

cp /media/hfc_media/linux/x86_64/oel7uek3/*.rpm /tmp/.

(2) install the hfcldd RPM package

Please install two RPM packages according to the following procedures.

cd /tmp

rpm -ivh --force hfcldd-4.37.18.3130-2.3.8.13_55.1.6.el7uek.x86_64.rpm hfcldd-tools-4.37.18.3130-2.3.8.13_55.1.6.el7uek.x86_64.rpm

Note 1) Type 'su' to root before installation.

Note 2) When you install two RPM packages by one line, the order is arbitrary. For instance, if you specify package name with the following order,

rpm -ivh --force hfcldd-4.37.18.3130-2.3.8.13_55.1.6.el7uek.x86_64.rpm hfcldd-tools-4.37.18.3130-2.3.8.13_55.1.6.el7uek.x86_64.rpm

You can successfully install driver since the installation order is protected.

However, be sure to install hfcldd driver package before installing tool package when you install these packages separately.

rpm -ivh --force hfcldd-4.37.18.3130-2.3.8.13_55.1.6.el7uek.x86_64.rpm
rpm -ivh --force hfcldd-tools-4.37.18.3130-2.3.8.13_55.1.6.el7uek.x86_64.rpm

Note 3) This rpm command updates kernel ramdisk image.

Note 4) Utility software is stored in /opt/hitachi/drivers/hba.

Note 5) Do not specify –U or –F option when execute rpm command. Specifying these options cause unloading driver to the current running kernel. It may cause system hung-up or break the system

(3) Confirm Install log

The version.txt is stored in /opt/hitachi/drivers/hba Confirm the message "Version 4.37.18.****" is displayed.

more version.txt

* Version 4.37.18.3130 Tue Mar 24 2015

(4) Reboot the system

Please reboot to load a new driver.

reboot

Confirm the driver version

Be sure that all of the installed Hitachi FC HBA cards were recognized by linux.(*) # ls /proc/scsi/hfcldd

0 1 (Scsi host numbers of the recognized HBA cards are displayed)

cat /proc/scsi/hfcldd/<scsi host number>

Hitachi PCI to Fibre Channel Host Bus Adapter

Driver version 4.36.18.3062 Firmware version 30045d

hfcldd driver version

(*) In the case of OEL7,

cat /sys/class/scsi_host/host*/hfcldd_proc

The installed driver version is same as <driver version> part of file name hfcldd-4.37.18.3130-2.3.8.13_55.1.6.el7uek.x86_64.rpm and is described in 'version.txt' at /opt/Hitachi/drivers/hba directory, too.

Update driver

Please install driver again according to the procedure of "Install driver to the internal disk device". When the driver version is downgraded, the procedure is the same as the procedure of "Driver installation for UEK".

Uninstall driver

Do not uninstall driver when booting from SAN.

Uninstalling driver may cause system hung-up or break the system.

Otherwise, follow the procedure shown in section below.

Uninstalling driver (OEL5)

(1) Uninstall rpm packages

rpm -e hfcldd-4.35.17.2152-1.2.6.39_200.31.1.el5uek hfcldd-tools-4.35.17.2152-1.2.6.39_200.31.1.el5uek

Note 1) Type 'su' to root before executing

Note 2) Be sure to uninstall tool package before uninstalling hfcldd package when you uninstall these packages separately.

Note 3) Uninstalling rpm packages cause updating kernel ramdisk image.

(2) Confirm uninstall log

The log is stored in /tmp/hfcldd_install.log.

Confirm "Uninstall Success" message is displayed.

For example,

```
---- Uninstall @Hitachi Fibre Channel Adapter Driver - Tue Nov 6 15:26:55 JST 2012

Modify /etc/modprobe.conf
---- Uninstall Success
```

(3) Reboot

reboot

(4) Confirm uninstallation log

Confirm /hfcldd directory no more exists in /proc/scsi

Is /proc/scsi

Uninstalling driver (OEL6)

(1) Uninstall rpm packages

```
# rpm -e hfcldd-4.36.18.3062-1.3.8.13_16.2.1.el6uek.x86_64 hfcldd-tools-4.36.18.3062-1.3.8.13_16.2.1.el6uek.x86_64
```

Note 1) Type 'su' to root before executing

Note 2) Be sure to uninstall tool package before uninstalling hfcldd package when you uninstall these packages separately.

Note 3) Uninstalling rpm packages cause updating kernel ramdisk image.

(2) Confirm uninstall log

The log is stored in /tmp/hfcldd_install.log.

Confirm "Uninstall Success" message is displayed.

For example,

```
---- Uninstall @Hitachi Fibre Channel Adapter Driver - Tue Nov 6 15:26:55 JST 2012

Modify /etc/modprobe.d/hfcldd_param.conf
---- Uninstall Successs
```

(3) Reboot

reboot

(4) Confirm uninstallation log

Confirm /hfcldd directory no more exists in /proc/scsi

Is /proc/scsi

Uninstalling driver (OEL7)

OEL7 supports only SAN booting.

Do not uninstall driver when booting from SAN.

Uninstalling driver may cause system hung-up or break the system.

Update RAMDISK image

You have to update the RAMDISK image, '/boot/<image-file-name>.img, when installing, updating or uninstalling the driver. Update appropriate RAMDISK image with reference to the setting file of the boot loader such as grub.conf.

Update RAMDISK image

Update the RAMDISK image executing the following commands.

cd /boot

/sbin/mkinitrd -f <image-file-name>.img <kernel version>

HITACHI Gigabit Fibre Channel Adapter INSTALLATION GUIDE (Oracle Linux driver Edition)

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