HITACHI
Gigabit Fibre Channel Adapter
USER'S GUIDE
(Utility Software Edition
- VMware)

Revision 31.0

Nov 2018

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.

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.

- The Hitachi Virtualization Manager (HVM) name has been changed to Hitachi logical partitioning manager (LPAR manager, or LP). If you are using HVM based logical partitioning feature, substitute references to Hitachi logical partitioning manager (LPAR manager, or LP) with HVM.

Important Notes

- It is strictly forbidden to reprint or duplicate part or this entire 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:

- To control a chemical plant, medical devices, emergency communications, or all objects that 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

Microsoft, Windows, and Windows Server are registered trademarks or trademarks of Microsoft Corp. in and outside the U.S.

Pentium and Xeon are trademarks or registered trademarks of Intel Corporation in and outside the U.S.

Linux is a registered trademark or trademark of Linus Torvalds in and outside the U.S.

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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.

❑ Windows

- Microsoft® Windows Server® 2016 Standard
  (Hereinafter, referred to as Windows Server 2016 Standard)
- Microsoft® Windows Server® 2016 Datacenter
  (Hereinafter, referred to as Windows Server 2016 Datacenter)
- Microsoft® Windows Server® 2012 R2 Standard
  (Hereinafter, referred to as Windows Server 2012 R2 Standard)
- Microsoft® Windows Server® 2012 R2 Datacenter
  (Hereinafter, referred to as Windows Server 2012 R2 Datacenter)
- Microsoft® Windows Server® 2012 Standard
  (Hereinafter, referred to as Windows Server 2012 Standard)
- Microsoft® Windows Server® 2012 Datacenter
  (Hereinafter, referred to as Windows Server 2012 Datacenter)
- Microsoft® Windows Server® 2008 R2 Standard
  (Hereinafter, referred to as Windows Server 2008 R2 Standard)
- Microsoft® Windows Server® 2008 R2 Enterprise
  (Hereinafter, referred to as Windows Server 2008 R2 Enterprise)
- Microsoft® Windows Server® 2008 R2 Datacenter
  (Hereinafter, referred to as Windows Server 2008 R2 Datacenter)
- Microsoft® Windows Server® 2008 Standard
  (Hereinafter, referred to as Windows Server 2008 Standard)
- Microsoft® Windows Server® 2008 Enterprise
  (Hereinafter, referred to as Windows Server 2008 Enterprise)
- Microsoft® Windows Server® 2008 Datacenter
  (Hereinafter, referred to as Windows Server 2008 Datacenter)

❑ Red Hat Linux

- 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 Advanced Platform
- Red Hat Enterprise Linux 5 Server
  (Hereinafter, referred to as Red Hat Enterprise Linux 5 or RHEL5)
- Red Hat Enterprise Linux AS
- Red Hat Enterprise Linux ES
  (Hereinafter, referred to as Red Hat Enterprise Linux 4 or RHEL4)
- Red Hat Enterprise Linux AS 3
  (Hereinafter, referred to as Red Hat Enterprise Linux 3 or RHEL3)

❑　VMware

- VMware vSphere® ESXi™ 6.7
(Hereinafter, referred to as ESXi 6.7)

- VMware vSphere® ESXi™ 6.5
(Hereinafter, referred to as ESXi 6.5)

- VMware vSphere® ESXi™ 6.0
(Hereinafter, referred to as ESXi 6.0)

- VMware vSphere® ESXi™ 5.5
(Hereinafter, referred to as ESXi 5.5)

- VMware vSphere® ESXi™ 5.1
(Hereinafter, referred to as ESXi 5.1)

- VMware vSphere® ESXi™ 5.0
(Hereinafter, referred to as ESXi 5.0)

- VMware® ESX™ 4.* or VMware® ESXi™ 4.*
(Hereinafter, referred to as ESX 4.* or ESXi 4.*)

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

1 **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.

Contents

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.

⚠ 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.

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

The example on the left indicates a shock hazard.

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

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

This pictogram (●) indicates an action to take. The figure inside the circle (●) 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 power cord immediately.

Do not repair, remodel or disassemble

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.

⚠ WARNING

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 heat-generating 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.

⚠ WARNING

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, you must 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.

Eye fatigue

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>

1

How to Use the Manuals

This section describes the manuals provided with Hitachi Gigabit Fibre Channel Adapter.

Manual Organization

HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE has several edition published in parts.

The contents of the User's Guide are shown below.

Edition	Contents
HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Hardware Edition)	Describes overview of Hitachi Gigabit Fibre Channel Adapter and procedures for the use of Hitachi Gigabit Fibre Channel Adapter such as installation, connection, handling and checking of operation.
HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (BIOS/EFI Edition)	Describes list of Option parameters of onboard BIOS and EFI. Also provides error log information of onboard BIOS and EFI.
HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Windows Driver Edition)	Describes procedures how to install and update Windows driver. Also provides error log information and list of driver parameters.
HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Linux/VMware Driver Edition)	Describes procedures how to install and update Linux/VMware driver. Also provides error log information and list of driver parameters.
HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Support Matrix Edition)	Details driver version and functions combinations that are supported by driver on each OS. This document also includes onboard firmware support matrix.
HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Utility Software Edition)	Describes list of parameters and operations of utility software to set and modify various parameters.
HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Utility Software Edition-VMware)	This manual. Describes operations of utility software for VMware ESXi 5.0 or later.

2

Before use

This section describes precautions to use CIM utility software for Hitachi Gigabit Fibre Channel Adapter.

Overview of management interface on ESXi 5.0 or later.

■ On VMware ESX 4.1 or earlier version, you can check the status of adapter or execute utility tools directly on Linux-based service console over the ESX host. On ESXi5.0 or later, the service console has been removed and the utility program splits in two layers, a user's side utility on remote client and host side plug-in which interacts with services and the drivers on ESXi and also responds requests from the utility on remote client.

■ To manage Hitachi Gigabit Fibre Channel Adapter, we support CIM provider as a host side plug-in so that you can collect information and update settings of an adapter through standards-based CIM (Common Interface Model) interface from a CIM client executing on remote client.
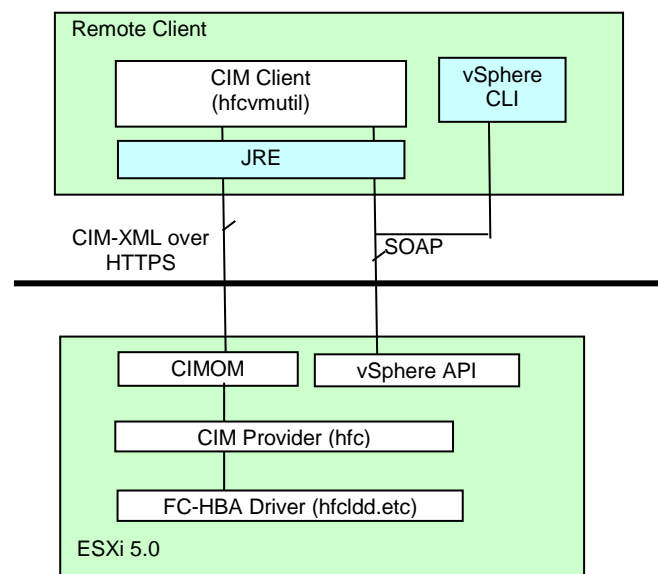
Precautions

- Root (vi-admin on vMA) or Administrator (Windows) privilege is required to execute Hitachi CIM client.

- Please install Hitachi CIM provider on ESXi. After installation, you have to reboot to load the installed Hitachi CIM provider.

- Please enable SSH on ESXi and set password authentication to true. For procedures how to enable SSH, please refer to "Enabling SSH on ESXi".

- Please obtain Server-Certificates of ESXi and import it to Java keystore. If Java keystore does not exist on the designated directory, you cannot execute firmware update function because file transfer from remote client to ESXi is blocked without Java keystore created from Server-Certificates.

- Management model using CIM provider and CIM client can only apply to ESXi 5.0 or later. To manage your adapter on VMware ESX 4.1 or earlier version, refer to HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Utility Software Edition) for details.

- Hitachi CIM client package contains open source libraries. Please refer and comply with open_source_license.txt and corresponding fill licenses of the libraries contained in the package.

- Please remain disabled or do not enable lockdown mode of ESXi when you manage ESXi from vCenter Server. Hitachi CIM client does not support ESXi when its Lockdown mode is enabled. For procedures how to checking Lockdown mode, please refer to "Checking and disabling Lockdown mode on ESXi".

- You have to install appropriate version of driver, CIM Provider and CIM client to work CIM interface properly. Please refer to HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Support Matrix Edition) for details.

- In ESXi 6.5 or earlier, we recommend vMA (vSphere Management Assistant) as a remote client platform. vMA is a linux-based virtual machine that includes prepackaged software such as vSphere command-line interface and other libraries. You can download vMA which supports your target ESXi at the following web site.

  ESXi5.0
  https://my.vmware.com/web/vmware/info/slug/datacenter_cloud_infrastructure/vmware_vsphere/5_0#drivers_tools

  ESXi5.1
  https://my.vmware.com/web/vmware/info/slug/datacenter_cloud_infrastructure/vmware_vsphere/5_1#drivers_tools

  ESXi5.5
  https://my.vmware.com/web/vmware/info/slug/datacenter_cloud_infrastructure/vmware_vsphere/5_5#drivers_tools

  ESXi6.0
  https://my.vmware.com/web/vmware/info/slug/datacenter_cloud_infrastructure/vmware_vsphere/6_0#drivers_tools

  ESXi6.5
  https://my.vmware.com/web/vmware/info/slug/datacenter_cloud_infrastructure/vmware_vsphere/6_5#drivers_tools

In ESXi 6.7 or later, vMA (vSphere Management Assistant) is not supported as a remote client platform because vMA 6.5 is the last release. Please use Linux or Windows.

■ If you use Windows as a remote client platform you have to download the following libraries and tools.

Download link addresses below are provided for your convenience. Addresses may change without notice.

a) JRE (Java Runtime Environment) Windows (32bit)

[ESXi6.5 or earlier]

version 1.6 update 20 (for CIM client version 1.28.16-20b or 1.28.16-30a)

Release Notes   http://www.oracle.com/technetwork/java/javase/6u20-142805.html

Download   http://www.oracle.com/technetwork/java/archive-139210.html

version 1.6 update 31 (for CIM client version 1.29.16-30b or later)

Release Notes   http://www.oracle.com/technetwork/java/javase/6u31-relnotes-1482342.html

Download   http://www.oracle.com/technetwork/java/archive-139210.html

version 1.7 update 21 (for CIM client version 1.40.16-40a or later
                and 1.42.18-80d or later)

Release Notes   http://www.oracle.com/technetwork/java/javase/7u21-relnotes-1932873.html

Download   http://www.oracle.com/technetwork/java/archive-139210.html

version 1.8 update xx (for CIM client version 1.42.19-100a or later)

Release Notes   http://www.oracle.com/technetwork/java/javase/8u-relnotes-2225394.html

Download (Latest version)
                http://www.oracle.com/technetwork/java/javase/downloads/index.html

Download (Java Archive)
                http://www.oracle.com/technetwork/java/archive-139210.html

[ESXi6.7 or later]

version 1.8 update xx (for CIM client version 1.42.19-100a or later)

Release Notes   http://www.oracle.com/technetwork/java/javase/8u-relnotes-2225394.html

Download (Latest version)
                http://www.oracle.com/technetwork/java/javase/downloads/index.html

Download (Java Archive)
                http://www.oracle.com/technetwork/java/archive-139210.html

b) Java Libraries(Not needed for CIM client version 1.29.16-30b or later)

The following versions of Java Libraries are contained in VMware vSphere Web Service SDK.

    JavaBeansActivationFramework   version 1.0.2

    JavaMail API   version 1.3.2

    Download
        https://my.vmware.com/web/vmware/details?downloadGroup=WEBSDK50&productId=229

        VMware vSphere Web Service SDK 5.0

■ When you use Linux as a remote client platform, you have to use OpenJDK (Open-source implementation of the JAVA platform) bundled with an OS Installer or use Oracle JRE. The following tables show the version of Linux and JRE that CIM client supported.

When you use OpenJDK, please use the OpenJDK version introduced at the time of OS installation.When you use Oracle JRE, you have to download the Oracle JRE.

Oracle JRE version 1.7 update 67 (for CIM client version 1.42.19-100a or later)

| Release Notes | http://www.oracle.com/technetwork/java/javase/7u67-relnotes-2251330.html |
| Download | http://www.oracle.com/technetwork/java/archive-139210.html |

Oracle JRE version 1.8 update xx (for CIM client version 1.42.19-100a or later)

Release Notes	http://www.oracle.com/technetwork/java/javase/8u-relnotes-2225394.html
Download (Latest version)	http://www.oracle.com/technetwork/java/javase/downloads/index.html
Download (Java Archive)	http://www.oracle.com/technetwork/java/archive-139210.html

No.	Supported Linux version as a remote client platform	OpenJDK version introduced at the time of OS installation.	Supported Java version			
			OpenJDK		Oracle JRE	
			ESXi6.5 or earlier	ESXi6.7 or later	ESXi6.5 or earlier	ESXi6.7 or later
1	RHEL6.2(32-bit, 64-bit)	1.6.0.0	not supported		1.7.0.67 1.8.0.xx	1.8.0.xx
2	RHEL6.4(32-bit, 64-bit)	1.7.0.09	1.7.0.09	not supported		
3	RHEL6.5(32-bit, 64-bit)	1.7.0.45	1.7.0.45	not supported		
4	RHEL6.6(32-bit, 64-bit)	1.7.0.65	1.7.0.65	not supported		
5	RHEL6.7(32-bit, 64-bit)	1.7.0.79	1.7.0.79	not supported		
6	RHEL6.8(32-bit, 64-bit)	1.7.0.99	1.7.0.99	not supported		
7	RHEL6.9(32-bit, 64-bit)	1.7.0.131	1.7.0.131	not supported		
8	RHEL7.1(64-bit)	1.7.0.75	1.7.0.75	not supported		
9	RHEL7.2(64-bit)	1.8.0.65	1.8.0.65			
10	RHEL7.3(64-bit)	1.8.0.102	1.8.0.102			
11	RHEL7.4(64-bit)	1.8.0.131	1.8.0.131			
12	RHEL7.5(64-bit)	1.8.0.161	1.8.0.161			

■ When you use Windows or Linux (RHEL6 and RHEL7) as a remote client platform, vSphere Command-Line Interface (vSphere CLI) of the standard CLI tool of VMware is necessary to install CIM provider or HBA driver.

vSphere SDK for Perl 4.0 and later is bundled with the vSphere Command-Line Interface (vSphere CLI).
Download link addresses below are provided for your convenience. Addresses may change without notice.

Download   https://my.vmware.com/jp/web/vmware/info/slug/datacenter_cloud _infrastructure/vmware_vsphere/5_0#drivers_tools (for ESXi5.0)

https://my.vmware.com/jp/web/vmware/info/slug/datacenter_cloud _infrastructure/vmware_vsphere/5_1#drivers_tools (for ESXi5.1)

https://my.vmware.com/jp/web/vmware/info/slug/datacenter_cloud _infrastructure/vmware_vsphere/5_5#drivers_tools (for ESXi5.5)

https://my.vmware.com/jp/web/vmware/info/slug/datacenter_cloud _infrastructure/vmware_vsphere/6_0#drivers_tools (for ESXi6.0)

https://my.vmware.com/jp/web/vmware/info/slug/datacenter_cloud _infrastructure/vmware_vsphere/6_5#drivers_tools (for ESXi6.5)

https://my.vmware.com/jp/web/vmware/info/slug/datacenter_cloud _infrastructure/vmware_vsphere/6_7#drivers_tools (for ESXi6.7)

*) You can also execute vSphere CLI command on ESXi shell of ESXi. In this case you do not need to install vSphere CLI on your Windows platform.

- In vSphere 5.0, both a host and a VIB support a set of acceptance levels, VMwareCertified (Highest), VMwareAccepted, PartnerSupported and CommunitySupported (Lowest).

  At any time, a host has the lowest acceptance level of any of the VIBs installed on that host. That means: if you want to add a VIB to a host that has an acceptance level that is lower than the host level, customers can explicitly change the host level.

  For details, refer to README.txt contained in the CIM provider package.

  For your reference, VMware package validation system defines that the acceptance level of the driver should be VMwareCertified and the acceptance level of CIM Provider should be VMwareAccepted

- Please apply the latest patch to your ESXi. Patches may affect behavior of CIM provider or CIM client. Please refer to appropriate system management manuals or its related release notes for details.

- In ESXi6.5 or later, please start the CIM object manager on ESXi to enable CIM provider. For procedures how to start the CIM object manager, please refer to "Starting CIM object manager (ESXi6.5 or later)".

- In ESXi6.5 or later, do not change port and authentication method of the CIM object manager. If it is differ from the default value (port=5989, authentication method=password), CIM client's command return error. For procedures how to check CIM object manager configuration, please refer to "Checking and changing CIM object manager configuration (ESXi6.5 or later)"

The correspondence relationship between previous VMware utility on ESX 4.1 or earlier and CIM client utility on ESXi 5.0 or later

The correspondence relationship between CIM client (hfcvmutil) and previous utilities is as follows.

No.	Function	hfcvmutil options (ESXi 5.0 or later)	Utility programs (ESXi 4.1 or earlier)
1	Display port number	hfcvmutil -pd	
2	Display General Information	hfcvmutil -g	-
3	Display or Set Port Parameters	hfcvmutil -p	-
4	Display Boot Information	hfcvmutil -b	-
5	Back up or Update FLASH-ROM	hfcvmutil -f	hfcmcup
6	Display target information	hfcvmutil -t	-
7	Online update of the firmware	hfcvmutil -u	hfcmcref
8	Display help information	hfcvmutil -h	-
9	Isolate or Recover adapter port	hfcvmutil -is -i	-
10	Initiate Target Scan	hfcvmutil -scan	-
11	Backup HBA BIOS settings(*1)	hfcvmutil -bk	-
12	Restore HBA BIOS settings(*1)	hfcvmutil -rs	-
13	Update or Delete port-specific configuration(*2)	hfcvmutil -ex	-
14	Performance Monitor(*2)	hfcvmutil -pm	-

(*1) This function is supported on CIM client utility version 1.29.18-60a or later (for ESXi 5.0 and ESXi 5.1) , 1.40.16-40a or later (for ESXi 5.5) and 1.xx.18-60a or later.

(*2) This function is supported by CIM client utility that supports 16Gbps Fibre Channel Adapter (version 1.xx.18-60a or later).

3

System Requirements

This chapter describes system requirements of Hitachi CIM client and provider for Hitachi Gigabit Fibre Channel Adapter.

Supported target ESX/ESXis

You can execute CIM client only for ESXi 5.0 or later.

#	ESXis	Support	Remarks
1	ESX 3.*	No	Please refer to HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Support Matrix Edition) for details. No utilities are supported on ESXi 4.1
2	ESX 4.*	No	
3	ESXi 5.*	Yes	Install Hitachi CIM provider on ESXi.
4	ESXi 6.0 or later	Yes	When Hitachi Custom Image is used at the time of installation, the CIM provider is already installed.

Supported remote client platform

The CIM client is supported for the following remote client OSs.
The character "Y" indicates a supported remote client platform.
The character "N" indicates that the platform is not supported. Other OSs not shown in this table do not support the CIM client.

Remote client platform		CIM client version		
		versions earlier than 1.42.18-80d	1.42.18-80d	1.42.19-100a or later
vMA	ESXi6.5 or earlier	Y *1	Y *1	
	ESXi6.7 or later	N	N	
Windows XP Professional 32-bit		Y *2	N	
Windows 7 [Professional/Enterprise] 32-bit and 64-bit		Y *2	N	
Windows 8 [Professional/Enterprise] 32-bit and 64-bit		Y *2	N	
Windows Server 2003 [Standard/Enterprise/Datacenter] 32-bit and 64-bit		Y *2	N	
Windows Server 2003 R2 [Standard/Enterprise/Datacenter] 32-bit and 64-bit		Y *2	N	
Windows Server 2008 [Standard/Enterprise/Datacenter] 32-bit and 64-bit		Y *2	N (for 32-bit) Y *2 (for 64-bit)	
Windows Server 2008 R2 [Standard/Enterprise/Datacenter] 64-bit		Y *2	Y *2	
Windows Server 2012 [Standard/ Datacenter] 64-bit		N	Y *2	
Windows Server 2012 R2 [Standard/ Datacenter] 64-bit		N	Y *2	
Windows Server 2016 [Standard/ Datacenter] 64-bit		N	N	Y *2
Red Hat Enterprise Linux Server 6.x 32-bit and 64-bit		N	N	Y
Red Hat Enterprise Linux Server 7.x 64-bit		N	N	Y

*1 In ESXi6.5 or earlier, we recommend vMA (vSphere Management Assistant) as a remote client platform since vMA includes prepackaged software such as vSphere command-line interface, JRE and other java libraries. In ESXi6.7 or later, vMA is not supported.

*2 You have to install several utilities additionally when you select Windows as a remote client platform.

CIM utility dependency

Dependency relationships exist among the versions of the CIM client, CIM provider, and driver. The CIM utility might not work properly depending on the combination of the versions that are used. To use the CIM utility, be sure to check the versions by referring to VMware in Driver support matrix in the manual HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Support Matrix Edition).
CIM client version 1.42.18-80d or later runs on any CIM provider version. Note, however, that some commands might return errors because they are not supported by certain CIM provider versions. For details, see the table below.

"Y" indicates the command is supported, while "N" indicates the command is not supported. If a command for which "N" is displayed is executed, the error "Operation Failed" is returned.

ESXi	CIM Provider version			
ESXi5.0/5.1	1.28.16-20	1.28.16-30	N/A	1.28.18-64 or later
ESXi5.5	N/A	N/A	1.40.16-40	1.40.18-62 or later
ESXi6.0	N/A	N/A	N/A	1.40.18-82 or later
ESXi6.5	N/A	N/A	N/A	1.40.20-112 or later
ESXi6.7	N/A	N/A	N/A	1.46.20-120 or later

#	Function				
1	Display port number	Y	Y	Y	Y
2	Display General Information	Y	Y	Y	Y
3	Display or Set Port Parameters				
	Display all	Y*2	Y*2	Y*2	Y
	Display <vmhba>	Y*2	Y*2	Y*2	Y
	Set/Delete all	Y*2	Y*2	Y*2	Y
	Set/Delete <vmhba>	N	N	N	Y
4	Display Boot Information				
	Display	Y	Y	Y	Y
	Set	N	N	N	Y
5	Back up or Update FLASH-ROM	Y	Y	Y	Y
6	Display target information	Y	Y	Y	Y
7	Online update of the firmware	Y	Y	Y	Y
8	Isolate or Recover adapter port	Y	Y	Y	Y
9	Initiate Target Scan	N	Y	Y	Y

ESXi	CIM Provider version			
ESXi5.0/5.1	1.28.16-20	1.28.16-30	N/A	1.28.18-64 or later
ESXi5.5	N/A	N/A	1.40.16-40	1.40.18-62 or later
ESXi6.0	N/A	N/A	N/A	1.40.18-82 or later
ESXi6.5	N/A	N/A	N/A	1.40.20-112 or later
ESXi6.7	N/A	N/A	N/A	1.46.20-120 or later

#	Function				
10	Backup HBA BIOS settings	N	N	Y	Y
11	Restore HBA BIOS settings	N	N	Y	Y
12	Update or Delete port-specific configuration	N	N	N	Y
13	Performance Monitor	*1	*1	*1	Y
14	Display help information	Y	Y	Y	Y

*1 This command is only valid on a 16 Gbps FC-HBA. Because 16 Gbps FC-HBAs are not supported by the corresponding CIM provider versions, the command does not work in these versions. For details on the error message, see Example: execution on a 4 Gbps FC-HBA or an 8 Gbps FC-HBA.

*2 The commands might not work depending on the options that are specified. For details, see Display or Set Port Parameters in Option List Table.

Required settings for ESXi

The following procedures below are provided for your convenience.
Please refer to "Precautions" and confirm whether to do the following procedures.
Please refer to appropriate system management manuals for details.

Enabling SSH on ESXi

To enable SSH and disable timeout, do the following:
- a) When ESXi boots, press F2 to enter configuration mode.
- b) Highlight **Troubleshooting Options** and press Enter.
- c) Select **Enable SSH** and press Enter.
- d) Press <ESC> twice to return to the main ESXi screen.

Checking and disabling Lockdown mode on ESXi

To disable lockdown mode, do the following:
- a) When ESXi boots, press F2 to enter configuration mode.
- b) Highlight **Configure Lockdown Mode** and press Enter.
- c) If Enable Lockdown mode is marked in the check box, uncheck the check box and press Enter.
- d) Reboot ESXi.

(Reboot is recommended but restart Management Agent if you cannot be able to reboot host)

- e) Highlight **Troubleshooting Options** and press Enter.
- f) Select **Restart Management Agents** and press Enter.
- g) Press F11.
- h) Press <ESC> twice to return to the main ESXi screen.

Starting the CIM object manager (ESXi6.5 or later)

To start the CIM object manager, do the following:

a) Check the CIM object manager configuration at ESXi shell.

#esxcli system wbem get

The example of executing on ESXi6.5

```
#esxcli system wbem get
   Authorization Model: password
   Enabled: true
   Loglevel: warning
   Port: 5989
   WSManagement Service: true
```

b) If an Enabled is not true, change an Enabled.(Reboot is not required. And this setting is persistent across reboots.)

#esxcli system wbem set --enable=true

Checking and changing CIM object manager configuration (ESXi6.5 or later)

To Check and change CIM object manager configuration, do the following:

a) Checking CIM object manager configuration at ESXi shell.

#esxcli system wbem get

The example of executing on ESXi6.5

```
#esxcli system wbem get
   Authorization Model: password
   Enabled: true
   Loglevel: warning
   Port: 5989
   WSManagement Service: true
```

b) Stop the CIM object manager.

#esxcli system wbem set --enable=false

c) If an Authorization Model is not password, change an Authorization Model.

#esxcli system wbem set --auth=password

d) If a Port is not 5989, change an Port.

#esxcli system wbem set --port=5989

e) Start the CIM object manager.

#esxcli system wbem set --enable=true

Required settings for remote client platform

The following procedures below are provided for your convenience.
Please refer to appropriate system management manuals for details.

Deploy vMA

Regarding system requirements and the procedures how to deploy vMA (vSphere Management Assist), please refer to vSphere management Assistant Guide for details.

http://www.vmware.com/support/pubs/vsphere-esxi-vcenter-server-pubs.html

You need the following additional settings to execute Hitachi CIM client on vMA.

(1) Please register the target host name to /etc/hosts.

vi-admin~> sudo   vi   /etc/hosts

```
127.0.0.1  localhost.localdom localhost localhost

::1     localhost.localdom localhost localhost ip6-localhost ip6-loopback

192.168.2.139   esx-test-machine ──────▶ Register the target host name

192.168.15.40   localhost.localdomain localhost (IP address of vMA)
```

(This is an example when IP address of a target ESXi is '192.168.2.139' and its host name is 'esx-test-machine'.)

(2) Restart network.
vi-admin~> sudo   /etc/init.d   network   restart

(3) Ping 'target host name' and check whether you can reach the target host by 'target host name'.
vi-admin-> sudo   ping   esx-test-machine

[Notes]

(*1) If you fail to configure vMA to use DHCP, you can configure a static IP address from vMA from console. Please refer   vSphere management Assistant Guide for detailed procedure.

(*2) You can operate vMA using the console in vSphere Client. By default, vMA is set to reject all connections from the network. Please apply appropriate settings you need.
.
(*3) When esxcli is executed, the error below might occur.
The following is an example of an error caused by the execution of esxcli to obtain the acceptance level.

```
vi-admin~> esxcli  -s  192.168.2.139  -u  root  -p  password  software
acceptance  get
Connect to 192.168.2.139 failed. Server SHA-1 thumbprint:
19:F4:99:70:8C:EA:7C:CB:11:31:26:1D:80:0A:F7:D5:36:67:08:16 (not trusted).
```

When this error occurs, please refer to <u>ESXCLI command displays SSH thumbprint</u>
<u>error</u> of the following page.

<u>https://www.vmware.com/support/developer/vima/vma60/vma_60_relnotes.html</u>

Additional packages you need to install on Windows

(1) JRE

For procedures how to install JRE, please refer release notes.

(2) Java libraries

Download vSphere Web Service SDK and unzip the package. You can extract required version of libraries from SDK. See Appendix for details.

If installing CIM client version is 1.29.16-30b or later, you would not install the libraries.

(3) vSphere CLI

For system requirements and installation procedure, how to install JRE, please refer manuals on the download page.

Additional packages you need to install on Linux(RHEL6 or RHEL7)

(1) OpenJDK(Package bundled JRE)

OpenJDK is not installed depending on a package group to choose at the time of OS installation. please refer installation guides.

RHEL6
>Choose "Customize now" on the Package Selection screen. and Select "Next". The next chooses "Based System" on the Package Group Details screen. and Select "Java Platform", and install it.

RHEL7
>Choose "SOFTWARE SELECTION" on "LOCALIZATION" screen of the installation at the time of the OS installation. The next chooses "JAVA Platform" in the "Add-Ons for Selected Enviroment". and install it.
>The content of "Add-Ons for Selected Enviroment" varies according to selection of "Base Enviroment".
>When "JAVA Platform" is not displayed in "Add-Ons for Selected Enviroment", Install a package more after logon in the first time.

(2) Oracle Java(JRE)

For procedures how to install JRE, please refer release notes.

(3) vSphere CLI

For system requirements and installation procedure, how to install JRE, please refer manuals on the download page.

Obtaining Server Certificate and importing it into the Java Keystore

Please obtain Server Certificates of target ESXi and import it to Java keystore file, 'vmware.keystore'.

You need vmware.keystore in the procedure (5) on 'Installing CIM client'.

For procedures how to obtain Server Certificates and how to import Server Certificates to Java Keystore, please refer Developer's Setup Guide - VMware vSphere Web Services SDK.

You can download the manual at the following web site.

http://www.vmware.com/support/developer/vc-sdk/

(1) Obtaining Server Certificates

Please refer 'Apendix: vSphere Server Certificates'

(2) Importing Server-Certificates into the Java Keystore

Please refer 'Importing Server-Certificates into the Java Keystore'.

4

Install CIM provider and client

This chapter describes how to install Hitachi CIM provider and CIM Client for Hitachi Gigabit Fibre Channel Adapter.

Package names

Package names of Hitachi CIM provider and CIM Client for Hitachi Gigabit Fibre Channel Adapter are as follows.

	Item	Package Name	Remarks
1.	CIM provider	HTI-hfccim-a.b.c-d-<build number>.zip	
2.	CIM client	hfcldd-vmware-cimtools-a.b.c-d.zip	

The following section describes how to install CIM provider and CIM client on vMA.

If you choose Windows as a remote client, most of the procedures are the same as vMA. Please refer Appendix for details.

Install and update CIM provider

Confirming CIM provider version

(1) Log on to vMA as vi-admin

(2) Executing the following command displays versions of Hitachi Gigabit Fiber Channel Adapter driver and CIM provider.

vi-admin~> esxcli -s <target IP address> -u <user id> -p <password> software vib list

IP address, user id and password for the target ESXi is 192.168.2.139, root and password in the following example.

```
vi-admin~> esxcli -s 192.168.2.139 -u root -p password software vib list

hfc            1.28.16-10b                      HITACHI VMwareAccepted    2011-05-13
scsi-hfcldd  4.28.16.1140d-1vmw.0.0.381646  VMware VMwareCertified   2011-04-21

CIM provider   FC HBA driver
```

You have to install appropriate version of driver to work CIM provider properly.

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Please refer to HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Support Matrix Edition) for details.

Note: An error might occur when esxcli is executed. When the error below occurs, see [Notes].

```
vi-admin~> esxcli -s 192.168.2.139 -u root -p password software vib list
Connect to 192.168.2.139 failed. Server SHA-1 thumbprint:
19:F4:99:70:8C:EA:7C:CB:11:31:26:1D:80:0A:F7:D5:36:67:08:16 (not trusted).
```

Installing CIM provider

If there is no CIM provider for Hitachi Gigabit Fiber Channel Adapter installed on your target ESXi, execute the following procedure. Otherwise, update CIM provider referring to 'Updating CIM provider'.

(1) Log in vMA as vi-admin

(2) Transfer zipped CIM provider file to the directory '/home' on vMA.

(3) Unzip CIM provider file and extract CIM provider VIB.

> vi-admin~> unzip HTI-hfccim-a.b.c.d-<build number>.zip

```
vi-admin~> unzip HTI-hfccim-1.28.16-20-453549.zip
Archive:  HTI-hfccim-1.28.16-20-453549.zip
 extracting: HTI-hfccim-1.28.16-20-offline_bundle-453549.zip
 extracting: vmware-esx-provider-hfc-1.28.16-20.vib    ←    VIB package
 extracting: doc/README.txt
```

(4) Transfer CIM provider VIB to the target ESXi.

In the following example, VIB is transferred to /tmp on ESXi using SCP command.

```
vi-admin~> scp vmware-esx-provider-hfc-a.b.c-d.vib root@192.168.2.139:/tmp
```

(5) Confirm an acceptance level of ESXi.

> vi-admin~>esxcli -s <target IP address> -u <user id> -p <password> software acceptance get

If an acceptance level is VMware Certified, change an acceptance Level of ESXi.

> vi-admin~>esxcli -s <target IP address> -u <user id> -p <password> software acceptance set --level=VMwareAccepted

(An example of changing an acceptance level from VMwareCertified to VMwareAccepted)

```
vi-admin~> esxcli -s  192.168.2.139  -u  root  -p  password  software
acceptance  get
VMwareCertified

vi-admin~> esxcli -s  192.168.2.139  -u  root  -p  password  software
acceptance set  --level=VMwareAccepted
Host acceptance level changed to 'VMwareAccepted'.

vi-admin~> esxcli -s  192.168.2.139  -u  root  -p  password  software
acceptance get
VMwareAccepted
```

Note: An error might occur when esxcli is executed. When the error below occurs, see [Notes].

```
vi-admin~> esxcli -s  192.168.2.139 -u  root -p  password  software
acceptance  get
Connect to 192.168.2.139 failed. Server SHA-1 thumbprint:
19:F4:99:70:8C:EA:7C:CB:11:31:26:1D:80:0A:F7:D5:36:67:08:16 (not trusted).
```

(6) Execute esxcli command to install CIM provider. *1)

vi-admin~>esxcli -s <target IP address> -u <user id> -p <password> software
vib   install -v <file name by full path>
(Put space between 'software' and 'vib')

```
vi-admin~> esxcli -s 192.168.2.139 -u root -p password software vib
install -v /tmp/vmware-esx-provider-hfc-1.28.16-10c.vib

Installation Result
   Message: The update completed successfully, but the system needs to be
rebooted for the changes to be effective.
   Reboot Required: true
   VIBs Installed: HITACHI_bootbank_hfc_1.28.16-10c
   VIBs Removed:
   VIBs Skipped:
```

(7) Reboot the target ESXi to upload newly-installed CIM provider.

(8) Check if the installed CIM provider is loaded on the ESXi referring to the 'Confirming CIM provider version'.

*1) If you install VIB directly on ESXi shell, execute the following command.

vi-admin~>esxcli software vib install -v <file name by full path>

```
# esxcli software vib install -v /tmp/vmware-esx-provider-hfc-1.28.16-10c.vib
```

Updating CIM provider

(1) Log on to vMA as vi-admin.

(2) Unzip CIM provider file, is transferred from vMA, and extract CIM provider VIB. Please refer (2) and (3) in 'Installing CIM provider'.

(3) Transfer CIM provider VIB to the target ESXi.

In the following example, transfer VIB using scp.

```
vi-admin~> scp vmware-esx-provider-hfc-a.b.c-d.vib root@192.168.2.139:/tmp
```

(4) Execute esxcli command to update CIM provider.

vi-admin~>esxcli   -s <target IP address> -u <user id> -p <password>   software vib update -v <file name by full path>
(Put space between <password> and 'vib')

```
vi-admin~> esxcli -s 192.168.2.139 -u root -p password software vib
update -v /tmp/vmware-esx-provider-hfc-1.28.16-10d.vib

Installation Result
   Message: The update completed successfully, but the system needs to be
rebooted for the changes to be effective.
   Reboot Required: true
   VIBs Installed: HITACHI_bootbank_hfc_1.28.16-10d
   VIBs Removed: HITACHI_bootbank_hfc_1.28.16-10c
   VIBs Skipped:
```

*) If you update VIB directly on ESXi shell, execute the following command.

#esxcli software vib update -v file name by full path>

```
# esxcli software vib update -v /tmp/vmware-esx-provider-hfc-1.28.16-10d.vib
```

(5) Reboot the target ESXi to upload updated CIM provider.

(6) Check if the installed CIM provider is loaded on the ESXi referring to the 'Confirming CIM provider version'.

Install and update CIM client

Installing CIM client

The following table shows recommended directory to install CIM client.

platform	Recommended install directory	Remarks
vMA Linux	/opt/hitachi/drivers/hba	
Windows Server 2003/2008/2003 R2/2008R2/ 2012/2012R2/20 16 x86/ x64	For x86 platform \Program Files\Hitachi\drivers\hba\hfcvm in the system disk. For x64 platform \Program Files(x86)\Hitachi\drivers\hba\hfcvm in the system disk.	
Windows XP Windows 7 Windows 8	The directory except 'Program Files' on the system disk. For the security reason, Windows OS does not allow write permission to the folder under the 'Program files' directory. Hitachi CIM Client program cannot run because it creates log files in the installed directory. Install CIM client except under the 'Program Files'.	

Execute the following procedure to install CIM client.

(1) Log on to vMA as vi-admin

    (In the case of Linux, log on in root user.)

(2) Transfer CIM client file to the directory '/home' on vMA.

(3) Create installed directory, '/opt/hitachi/drivers/hba'.

       vi-admin~> sudo install -d -o vi-admin -g root /opt/hitachi/drivers/hba

       (In the case of Linux, sudo install -d -o root -g root /opt/hitachi/drivers/hba)

(4) Copy CIM client package on '/opt/hitachi/drivers/hba'.

       vi-admin~> sudo cp hfcldd-vmware-cimtools-<cam version>-zip /opt/hitachi/drivers/hba

(5) Unzip CIM client package.

       vi-admin~> cd /opt/hitachi/drivers/hba

       vi-admin~> sudo unzip hfcldd-vmware-cimtools-<cim version>-zip

(6) Copy 'vmware.keystore' (Java keystore created by Server certificates on 'Obtaining Server Certificate and importing it into the Java Keystore') to '/opt/hitachi/drivers/hba/VMware-Certs'.

> ex)
>
> vi-admin~> sudo cp /home/vi-admin/vmware.keystore /opt/hitachi/drivers/hba/VMware-Certs
>
> vi-admin~> sudo ls VMware-Certs
>
> vmware.keystore

(7) Confirm the installation path where the Java application program is installed on vMA. The following example shows an operation with the "which" command.

> vi-admin~> which java

```
vi-admin~> which java
/usr/java/jre-vmware/bin/java        The part aside from "/bin/java", "/usr/java/jre-
                              ◄──vmware", is the installation path.
```

In the case of Linux

```
[root]# which java
/usr/bin/java
[root]# ls -l /usr/bin/java
lrwxrwxrwx. 1 root root 22 Nov 26 14:12 2015 /usr/bin/java ->
/etc/alternatives/java
[root]# ls -l /etc/alternatives/java
lrwxrwxrwx. 1 root root 46 Nov 26 14:12 2015 /etc/alternatives/java ->
/usr/lib/jvm/jre-1.7.0-openjdk.x86_64/bin/java

                    The part aside from "/bin/java", "/usr/lib/jvm/jre-
                    1.7.0-openjdk.x86_64 ", is the installation path.
```

(8) Confirm that the value of HFCJAVA in hfcvmutil.sh is the same as the installation path confirmed at (7) above.

> vi-admin~> cat /opt/hitachi/drivers/hba/hfcvmutil.sh

```
vi-admin~> cat /opt/hitachi/drivers/hba/hfcvmutil.sh
#!/bin/sh

export HFCHOME=.                        This value has to be the same as the
export HFCJAVA=/usr/java/jre-vmware ◄── installation path confirmed at (7).
export HFCWBEM=${HFCHOME}/sblim-cim-client2-2.2.2-bin
 :
```

Change the value of HFCJAVA to the installation path confirmed at (7) above if the value isn't the same as the installation path. Whereas, when the value is the same as the installation path, no changes are necessary.

```
vi-admin~> cat /opt/hitachi/drivers/hba/hfcvmutil.sh
#!/bin/sh

export HFCHOME=.                              Different from the installation path
export HFCJAVA=/usr/java/default   ◄────      confirmed at (7)
export HFCWBEM=${HFCHOME}/sblim-cim-client2-2.2.2-bin
 :


vi-admin~> sudo vi /opt/hitachi/drivers/hba/hfcvmutil.sh
export HFCHOME=.                              Change the value to the installation
export HFCJAVA=/usr/java/jre-vmware  ◄────    path confirmed at (7)
export HFCWBEM=${HFCHOME}/sblim-cim-client2-2.2.2-bin
 :
```

(9) Execute 'Display General Information' option to confirm whether CIM client works properly.

 If the following command terminates without any response as shown in the following figure, please confirm both values are same the value of HFCJAVA in hfcvmutil.sh and the installed path is confirmed in (7).

```
vi-admin@localhost:~> sudo ./hfcvmutil.sh  192.168.2.139 root password no -g
vi-admin@localhost:~>   ◄────────   Command terminated with no response message
                                    displayed.
```


If hfcvmutil returns error, please refer 'List of return code of hfcvmutil' and check your settings of the host and the remote client.

Confirm CIM client version and vmhba number of the port.

You can confirm CIM client version on executing 'Display General Information' option. Please refer the execution example of 'Installing CIM client' for details.

Please designate 'vmhba number' to identify a port when using hfcvmutil and other standard commands that VMware provides. You can also confirm vmhba number on executing 'Display General Information' or 'Display port number' options and so on.

Updating CIM client

Please delete all components on the install directory and install new CIM client again according to the procedure described on 'Installing CIM client'.

5

hfcvmutil

This chapter describes how to use hfcvmutil to manage Hitachi Gigabit Fibre Channel Adapter.

List of options

- Executing hfcvmutil on remote client provides you various operations to manage Hitachi Gigabit Fibre Channel Adapter.

- The 'hfcvmutil' is a shell script on vMA or Windows batch file which actually initiates CIM client.

- The script 'hfcvmutil' supports CLI interface only. It requires an option to execute specific function.

- Root or Administrator privilege (vi-admin on vMA and Administrator on Windows) is required to execute Hitachi CIM client.

- The following table shows an option for each function.

No	Functions	Option (*1)	Remarks
1	Display port number	hfcvmutil -pd	
2	Display General Information	hfcvmutil -g	
3	Display or Set Port Parameters	hfcvmutil -p	
4	Display Boot Information	hfcvmutil -b	
5	Back up or Update FLASH-ROM	hfcvmutil -f	
6	Display target information	hfcvmutil -t	
7	Online update of the firmware	hfcvmutil -u	
8	Display help information	hfcvmutil -h	
9	Isolate or Recover adapter port	hfcvmutil -is -i	
10	Initiate Target Scan	hfcvmutil -scan	
11	Backup HBA BIOS settings	hfcvmutil -bk	(*4)
12	Restore HBA BIOS settings	hfcvmutil -rs	(*4)
13	Update or Delete port-specific configuration	hfcvmutil -ex	(*3)
14	Performance Monitor	hfcvmutil -pm	(*3)

(*1) When you execute hfcvmutil.bat on command prompt, you can omit '.bat' and only input 'hfcvmutil' to initiate batch file.

When you execute hfcvmutil.sh on vMA, you should specify './hfcvmutil.sh' on /opt/hitachi/drivers/hba directory.

(*2) If you execute hfcvmutil on vMA, add 'sudo' before the script './hfcvmutil.sh'.
(*3) This function is supported by CIM client utility that supports 16Gbps Fibre Channel Adapter (version 1.xx.18-60a or later).
(*4) This function is supported on CIM client utility version 1.xx.16.40a or later.

Definition of the option descriptions

The following section describes the detail of the commands.

Symbols used in the syntax column means the followings:

[   ]:   You can omit the options in parenthesis.

{A|B}:   You can select the option A or B.

<options>.. :   You can select multiple options in <option>.

<target IP address>

                     : IP address or host name of the target ESXi.

<username>   : User id of the target ESXi.

<password>   : Password of the target ESXi.

{yes|no}   : Specify whether you do not use Java Keystore created from Server
                     Certificates, that means you ignore Server Certificates {yes}, or use
                     Java Keystore (no).The default is {no} (Use Server Certificates).

<vmhba>   : The port number that ESXi assigns to each device.

                     You can confirm vmhba number either executing on 'Display port
                     number', 'Display General Information' or on vSphere Client.

Setting the target host information to configuration file

Writing the target information to the configuration file (vmutil.conf) enables you to omit
specifying the target ESXi information, such as IP address, username, password,
availability of Java Keystore every time when executing hfcvmutil.

The configuration file, vmutil.conf defines the following format.

ipaddr=<target IP address> username=<username> password=<password>
ignorecert={yes|no}

Place the 'vmutil.conf' on the same directory as 'hfcvmutil.sh' or 'hfcvmutil.bat'.

```
#less vmutil.conf
ipaddr=192.168.2.139  username=root  password=password  Ignorecert=no
```

Functions

Display port number

[Function] Display port number and the target information.

[Syntax]

<Display> hfcvmutil [<target IP address> <username> <password> {yes|no}] -pd

[Example]

```
#hfcvmutil -pd
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
--------------------------------------------------------
vmhba20 (hfcldd0)    WWPN:50000870003022dc  [LinkDown]
--------------------------------------------------------
Connected targets and Lus:
  No Target
--------------------------------------------------------
vmhba21 (hfcldd1)    WWPN:500008700056a454 [LinkUp]
--------------------------------------------------------
Connected targets and Lus:
  50060e8000c3f386:0000
  50060e8000c3f386:0001
  50060e8000c3f386:0002
  50060e8000c3f386:0003
#
```

[Field definitions]

Item of display	Description	
vmhba*	Vmhba number	
hfcldd*/ hfcndd*	Logical device name	
	hfcldd*	Logical device number that vmklinux driver recognizes
	hfcndd*	Logical device number that native driver recognizes
WWPN	World Wide Port Name	
[LinkStatus]	Port status	
	LinkUp	Normal operational status
	LinkDown	FC cable is not plugged.
	WaitLinkUp	Port is waiting for Linkup from Linkdown.
	Isolate(SFPFail)	SFP is damaged.
	Isolate(SFPNotSupport)	SFP is unsupported.
	Isolate(SFPDown)	SFP is not plugged.
	Isolate(CHK-STP)	Adapter is check-stopped
	Isolate(C)	This port is isolated
targets	Target WWPN	
Lus	LU number	

Display General Information

[Function] Display server information and adapter information.

[Syntax]

<Display> hfcvmutil [<target IP address> <username> <password> {yes|no}] -g

[Example]

CIM Client version earlier than 1.42.19-100a

```
# ./hfcvmutil -g
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
-------------------------------------------------------------
Host Name             : localhost
Build Number          : VMware ESXi 5.5.0 build-1623387
Driver Version        : 4.40.18.2446
CIM Provider Version   : 1.40.18-82
CIM Client Version     : 1.40.18-80d
-------------------------------------------------------------
Vender ID : 1054
Device ID : 3020
Manufacturer ID : Hitachi Corporation
Parts number : 3HAC81101-A
EC level : F
Model name : HFCE0802
Firmware : 30046f
vmhba6 (hfcldd3) WWPN:500008700056a118 Location:34:00:00 Status:LinkUp
SFP Part Number    : FTLF8528P2BCV-HD
     Serial Number : PFR21PN
     Date Code     : 090618
     Transceiver Replacement : not replaceable
vmhba7 (hfcldd4) WWPN:500008700056a11a Location:34:00:01 Status:LinkUp
SFP Part Number    : FTLF8528P2BCV-HD
     Serial Number : PFR21BG
     Date Code     : 090618
     Transceiver Replacement : not replaceable

Vender ID : 1054
Device ID : 3070
Manufacturer ID : Hitachi Corporation
Parts number : 3HAC92xxx-B
EC level : D
Model name : HFCE1601
Firmware : 400117
ECID : 00000000 00000000 00000000 00000000 00000000 00000002 04000000 00000008
       00000000 00000000 00000000 00000000 26000000 20efe8d0 70e61083 0030a180
vmhba2 (hfcldd0) WWPN:50000870005b4312 Location:03:00:00 Status:LinkUp
   vport: 10  WWPN:C003FF0000000010  [LinkUp]
   vport: 30  WWPN:C003FF0000000030  [LinkUp]
SFP Part Number    : AFBR-57F5MZ-HT1
     Serial Number : AA1324J1EVC
     Date Code     : 130611
     Transceiver Replacement : not replaceable
...
```

Display information for every Adapter

CIM Client version 1.42.19-100a or later

```
# ./hfcvmutil -g
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
--- Host Information ----------------------------------------
Host Name : localhost
Build Number : VMware ESXi 6.0.0 build-2494585
CIM Client Version : 1.42.19-100a


--- Adapter Information ------------------------------------
Vender ID : 1054
Device ID : 3020
Manufacturer ID : Hitachi Corporation
Parts number : 3HAC81100-A
EC level : E
Model name : HFCE0802
Driver : HITACHI FC HBA Driver hfcldd 4.40.18.2428
Firmware : 300504
CIM Provider : HITACHI CMPI HBA CIM Provider 1.40.19-100
--- Port Information ---------------------------------------
vmhba8 (hfcldd0) WWPN:500008700056a0c8 Location:03:00:00 Status:LinkUp
SFP Part Number   : FTLF8528P2BCV-HD
    Serial Number : UEM01CV
    Date Code     : 081124
    Transceiver Replacement : not replaceable
--- Port Information ---------------------------------------
vmhba9 (hfcldd1) WWPN:500008700056a0ca Location:03:00:01 Status:LinkUp
SFP Part Number   : FTLF8528P2BCV-HD
    Serial Number : UEM01CL
    Date Code     : 081120
    Transceiver Replacement : not replaceable


--- Adapter Information ------------------------------------
Vender ID : 1054
Device ID : 3070
Manufacturer ID : Hitachi Corporation
Parts number : 3HAC92xxx-A
EC level : D
Model name : HFCE1602
Driver : HITACHI FC HBA Driver hfcndd 10.42.19.96
Firmware : 40030c
CIM Provider : HITACHI CMPI HBA CIM Provider 1.40.19-100
ECID : 00000000 00000000 00000000 00000000 00000000 00000002 04000000 00000008
       00000000 00000000 00000000 00000000 9d000000 206f4818 70e61083 0030a180
--- Port Information ---------------------------------------
vmhba6 (hfcndd0) WWPN:50000870005b4210 Location:1a:00:00 Status:LinkUp
SFP Part Number   : AFBR-57F5MZ-HT1
    Serial Number : AA1324J1F17
    Date Code     : 130611
    Transceiver Replacement : not replaceable
--- Port Information ---------------------------------------
vmhba7 (hfcndd1) WWPN:50000870005b4212 Location:1a:00:01 Status:LinkUp
SFP Part Number   : AFBR-57F5MZ-HT1
    Serial Number : AA1324J1F0Z
    Date Code     : 130611
    Transceiver Replacement : not replaceable
......
```

[Field definitions]

Item of display		Description	
Server information			
	Host Name	Host name	
	Build number	ESXi build number	
	Driver Version(*4)	Driver version	
	CIM Provider Version(*4)	CIM Provider Version	
	CIM Client Version	CIM Client Version	
Adapter information			
	Vendor ID	Vendor ID	
	Device ID	Device ID	
	Manufacturer ID	Manufacturer ID	
	Parts Number	Parts number	
	EC Level	EC level	
	Model name	Model name *1	
	Driver(*5)	Driver name	
	Firmware	Firmware version	
	CIM Provider(*5)	CIM Provider name	
	ECID (*2)	Exclusive Chip ID (ID for each LSI)	
	vmhba*	vmhba number	
	hfcldd*/ hfcndd*	Logical device name	
		hfcldd*	Logical device number that vmklinux driver recognizes
		hfcndd*	Logical device number that native driver recognizes
	WWPN	World Wide Port Name	
	Location	**Bus:Dev:Func**	
	Status	Port state	
		LinkUp	Normal operational status
		LinkDown	FC cable is not plugged.
		WaitLinkUp	Port is waiting for Linkup from Linkdown.
		Isolate(SFPFail)	SFP is damaged.
		Isolate (SFPNotSupport)	SFP is unsupported.
		Isolate(SFPDown)	SFP is not plugged.
		Isolate(CHK-STP)	Adapter is check-stopped
		Isolate(C)	This port is isolated
	Virtual Fibre Channel Information (*3)		
	vport	Number to identify Virtual Fibre Channel Ports	
	WWPN	World Wide Port Name of the Virtual Fibre Channel	
	[LinkStatus]	LinkUp	Normal Status
		LinkDown	Cannot use the Virtual Fibre Channel Port
		WaitLinkUp	Wait Linkup status
	SFPPart Number	SFP type	
	Serial Number	SFP serial number	
	Date Code	SFP date code	
	Transceiver Replacement	SFP status (Not replaceable: Unable to replace SFP)	

(*1) If you use the embedded FC switch module in Hitachi Compute Blade 320 or Hitachi Compute Blade 2000, the model name may be displayed as 'Unknown Model'.

(*2) hfcvmutil command displays this parameter value only with 16Gbps Fibre Channel Adapter.

(*3) This information will be displayed only if you created a Virtual Fibre Channel.

(*4) If CIM client version is 1.42.19-100a or later it is not displayed.

(*5) On CIM client version 1.42.19.100a or later, it is displayed by each adapter unit and the version indication form is different from the former version.

Display or Set Port Parameters

❑ **hfcvmutil that supports 16Gbps Fibre Channel Adapter**

This section refers to the hfcvmutil that supports 16Gbps Fibre Channel Adapter (version 1.40.18-60a or later). For the other versions of hfcvmutil that do not support 16Gbps Fibre Channel Adapter, please refer to p53. You can check hfcvmutil version by executing a command, "hfcvmutil -g". For details, refer to "Display General Information".

[Function] Display or Set the Port Information
[Syntax]
    <Display> hfcvmutil [<target IP address> <username> <password> {yes|no}] -p {<vmhba>|all}

If you specify "-p <vmhba>" as an argument of this command, then it shows you the specified and currently working parameter values of a port.
If you specify "-p all" as an argument of this command, it shows, sets, or deletes the parameters on all adapter ports in the OS. The parameters specified to each port or to the all system are stored in /etc/vmware/esx.conf in the ESXi system.

    <Set/Delete> hfcvmutil [<target IP address> <username> <password> {yes|no}] -p [delete]{<vmhba>|all} <options>...

If you specified "-p all <option> <available parameter for the option (unit)>" to hfcvmutil command, you can modify the system-wide parameters in the Option List Table below.
If you specified "-p <vmhba> <option> <available parameter for the option>" to hfcvmutil command, you can modify the port-specific parameters in the Option List Table below.
If you specified "-p delete all <option>" to hfcvmutil command, you can delete the system-wide parameters in the Option List Table below.
If you specified "-p delete <vmhba> <option>" to hfcvmutil command, you can delete the port-specific parameters in the Option List Table below.

Available parameter names and its values are displayed in the Option List Table below.
In the table, [4Gbps], [8Gbps], [16Gbps] represents 4Gbps FC-HBA, 8Gbps FC-HBA, 16Gbps FC-HBA. Those words are described in the entries that have some difference on the adapter type.

[Columns of the Option List Table]

■ "Option", "Configurable values (unit)"

It indicates Configurable Option names and parameter values.

[Example] Set Link Speed of a 8Gbps FC-HBA to 8Gbps

```
# ./hfcvmutil -p hfcldd2 sp 8
Time:2014/05/26 20:52:13

Succeeded.
Reboot your system for the changes to take effect.
#
```

A value described in the configurable option field in the Option List Table. Do not specify any unit to specify parameter values.

The option name defined in the Option List Table.

■ Indicated item name

It indicates the strings appeard in the display command "(hfcvmutil -p [{<logical-device-name>|all}])" of the section "Display or Set Port Parameters". For details, refer to the same entry name in the section "Driver parameters".

■ Configurable Adapter

There are some parameters that can only be configurable on a specific Adapter. The parameter configurable only on 16Gbps FC-HBA have a character "Y" on the "[16Gbps]" column. The parameter configurable only on 8Gpbs or lesser FC-HBAs have a character "Y" on the "[Lesser than 8Gbps]" column. If the parameter you want to change have a character "N" on the column of your type of FC-HBA, you cannot set the parameter value. If you try to set the parameter value by specifying the logical device of the target adapter for which "N" is displayed for the parameter, the following syntax error occurs: Command syntax error (command help -h option).

■ Configurable to all ports or to logical devices

This column shows each parameter value is configurable to all devices or logical devices. A character "Y" means that you can configure the parameter value to all ports or the logical device, "N" means that you cannot configure the parameter value to all ports or the logical device.

[Example] Specify "8" as Link Speed of all ports.

```
# ./hfcvmutil -p hfcldd2 sp 8
Time:2014/05/26 20:52:13

Succeeded.
Reboot your system for the changes to take effect.
# ./hfcvmutil -p all sp 8

Failed.
Input option is not support operation.(delete, {all|<Device>})
Please refer to "hfcvmutil.log"
#
```

"sp" option have a character "N" on the "all" column, therefore if you specified "all" then you get an error.

■ Deletable

This column shows whether you can delete the specified parameter value or not. A character "Y" means you can delete the parameter value, and "N" means you cannot delete the parameter value. You can rollback once configured parameter value to a default value by deleting the previously configured value. The parameters with a character "Y" in the "Reboot required" column are not changed until the next reboot.

■ Default value

This column shows a default parameter value effective on environments without any configured parameters or with deleted parameters.

■ Reboot required

This column shows a system reboot is required or not when you changed the parameter value. A character "Y" means that the system needs to be rebooted if you changed the paramter value and want to activate it. A character "N" means that changed parameter value is activated on the system immediately.

For details of the parameters with a character "N", refer to the section **column**.

Option List Table

Option	Configurable values (unit)	Indicated item name	Configurable Adapters		Configurable to		Deletable	Default value	Reboot required
			[Lesser than 8Gbps]	[16Gbps]	All ports	Logical devices			
ct *4	auto ptop loop	Connection Type	Y	Y	N	Y	N	auto	Y
sp *4	[4Gbps] auto 1 2 4 (Gbps) [8Gbps] auto 2 4 8 (Gbps) [16Gbps] auto 4 8 16 (Gbps)	Link Speed	Y	Y	N	Y	N	auto	Y
mt	1 4 8 16 32 (MB)	Max Transfer Size	Y	Y	Y	Y	Y	16	Y
lo *4	0-60 (sec)	Login Delay Time	Y	Y	N	Y	Y	[Lesser than 8Gbps] 2 [16Gbps] 3	N
ld	0-60 (sec)	Link Down Time	Y	Y	Y	Y	Y	15	N

Option	Configurable values (unit)	Indicated item name	Configurable Adapters		Configurable to		Deletable	Default value	Reboot required
			[Lesser than 8Gbps]	[16Gbps]	All ports	Logical devices			
rd	0-60 (sec)	Reset Delay Time	Y	Y	Y	Y	Y	[Lesser than 8Gbps] 7 [16Gbps] 0	N
rt	0-60 (sec)	Reset Timeout	Y	Y	Y	Y	Y	20	N
at	0-60 (sec)	Abort Timeout	Y	Y	Y	Y	Y	8	N
qd	1-256	Queue Depth	Y	Y	Y	Y	Y	32	Y
mc	0-10 (times)	Machine Check	Y	Y	Y	Y	Y	8	N
ir	int msi msix	Interrupt Type	Y	Y	Y	Y	Y	[Lesser than 8Gbps] vmklinux driver: int native driver: msix [16Gbps] msix	Y
lm *5	def disable verbose	Logging Mode	Y	Y	Y	N *2	Y	def	N
tf *5	no pid	Login Target Filter	Y	N	Y	N *2	Y	no	N
tfx *5	pid no	Login Target Filter 16G or Login Target Filter Ext	N *1	Y	Y	N *2	N	pid	N *3
ldm	0-60 (sec)	MCK Link Down Time	N	Y	Y	Y	Y	15	N
lr	multi single	Link Reset Mode	N	Y	Y	Y	Y	multi	N

Option	Configurable values (unit)	Indicated item name	Configurable Adapters		Configurable to		Deletable	Default value	Reboot required
			[Lesser than 8Gbps]	[16Gbps]	All ports	Logical devices			
lit	1-255 (sec)	Init Negotiation Time	N	Y	Y	Y	Y	120	N
vp	1-255	Max Vport number for NPIV	N	Y	Y	Y	Y	255	Y
trs	disable enable	Target Restrain	N	Y	Y	Y	Y	disable	N
mpid	disable enable	Multiple PortID	N	Y	N	Y	N	disable	Y
cc	minq iosize	Core Control	N	Y	N	Y	Y	minq	N
cc-size	1-32768 (KB)	Core Control I/O Size	N	Y	N	Y	Y	1024	N
ic	0-300: min.unit is 10us 300-3000: min.unit is 100us (us)	Interrupt Coalescing	N	Y	N	Y	Y	0	N
ioex	off on	Exchange per Core	N	Y	Y	Y	Y	off	N
pm	off on	Additional Performance Monitor	N	Y	Y	Y	Y	off	N
mque	enable disable	Multi queue	N	Y	Y	Y	Y	disable	Y

*1 The parameter value can be configured if you are using CIM client version 1.29.18-80a or 1.40.18-80a. If you are using CIM client version 1.42.18-80d or later, the parameter value can be configured only if the CIM provider version is 1.xx.18-80 or later. If the CIM provider version is a version earlier than 1.xx.18-80, an error occurs.

*2 The parameter value can be configured if you are using CIM client version 1.29.18-80a or 1.40.18-80a. If you are using CIM client version 1.42.18-80d or later, the parameter value can be configured only if the CIM provider version is 1.xx.18-80 or later. If the CIM provider version is a version earlier than 1.xx.18-80, an error occurs.

*3 When you set for "[Lesser than 8Gbps]", "Reboot required" is "Y".

*4 If the CIM provider version is 1.xx.18.60 or later, the parameter value can be configured. If the CIM provider version is a version earlier than 1.xx.18.60, an error occurs.

*5 The parameter value cannot be configured if the CIM provider version is 1.28.16-20.

The parameters with a character "N" in the "Reboot required" column

If you change the parameters with symbol "N" in the "Reboot required" column, a message below is displayed and the new parameter becomes effective in Hitachi Fibre Channel Adapter driver without reboot.

```
#./hfcvmutil -p all lm def
Time:xxxx/xx/xx xx:xx:xx
Succeeded.
Applying parameters setting to the driver....
(If hfcvmutil succeed to reflect the specified value to the driver, the message shown
below is displayed.)
Succeeded.

(If hfcvmutil failed to reflect the specified value to the driver, the message shown
below is displayed.)
hfcldd0 Failed to apply parameter immediately
Failed.

<Notice>
If you specified both types of parameters, dynamically modifiable one and not
modifiable one, for example "rt" and "qd", then the following message are displayed.

You must reboot your host for the changes to take effect.
Applying parameters setting to the driver....
...
```

If some error occurred and the new parameter does not become effective in Hitachi Fibre Channel Adapter driver, /etc/vmware/esx.conf in the ESXi host is updated. Therefore, the new parameter value is used after next reboot of the ESXi host.

[Example]

(1) Display information for specified vmhba port.
If you specified a vmhba port to hfcvmutil command, it displays the currently working parameter values of the specified port. The character "-" means that user-configured value is not currently working on the port.

Example) Target vmhba number is 16Gbps FC-HBA.

```
# ./hfcvmutil -p vmhba2
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
----------------------------------------------------------------
vmhba2 (hfcldd0)  WWPN: 50000870005b4312  [LinkUp]
----------------------------------------------------------------
Connection Type             : Point to Point[fabric] (Auto)
Multiple PortID             : disable (disable)
Link Speed                  : 4 Gbps (Auto)
Login Delay Time            : 3 sec (-)
Max Transfer Size           : 16 MB (-)
Link Down Time              : 15 sec (-)
Reset Delay Time            : 0 sec (-)
Machine Check               : 8 (-)
Reset Timeout               : 20 sec (-)
Abort Timeout               : 8 sec (-)
Target Restrain             : disable (-)
Queue Depth                 : 32 (-)
Interrupt type              : MSI-X Mode (-)
Logging Mode                : default (-)
Login Target Filter Ext     : pid (pid)
Login Target Filter Function : on
MCK Link Down Time          : 15 sec (-)
Link Reset Mode             : Multi Path (-)
Init Negotiation Time       : 120 sec (-)
NPIV vport count            : 255 (-)
Core Control                : minq (-)
Core Control I/O Size       : 1024 KB (-)
Exchange per Core           : off (-)
Interrupt Coalescing        : 0 usec (-)
Additional Performance Monitor: off (-)
Multi queue                 : disable (-)
```

"Login Target Filter Function" and "Login Target Filter Ext" might not be displayed depending on the CIM Client versions. For details, see the following table.

CIM Client version	Login Target Filter Function	Login Target Filter Ext
1.29.18-60a 1.40.18-60a	Not display	"Login Target Filter 16G" is displayed instead of "Login Target Filter Ext".
1.29.18-80a 1.40.18-80a 1.42.18-80d or later	Display	Display
Other versions	Not display	Not display

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Example) Target vmhba number is 4Gbps FC-HBA or 8Gbps FC-HBA.

```
# ./hfcvmutil -p vmhba2
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
-------------------------------------------------------------
vmhba2 (hfcldd0)  WWPN: 50000870005b4312  [LinkUp]
-------------------------------------------------------------
Connection Type              : Point to Point[fabric] (Auto)
Link Speed                   : 8 Gbps (Auto)
Login Delay Time             : 2 sec (-)
Max Transfer Size            : 16 MB (-)
Link Down Time               : 15 sec (-)
Reset Delay Time             : 7 sec (-)
Machine Check                : 8 (-)
Reset Timeout                : 20 sec (-)
Abort Timeout                : 8 sec (-)
Queue Depth                  : 32 (-)
Interrupt type               : Legacy Mode (-)
Logging Mode                 : default (-)
Login Target Filter          : none (-)
Login Target Filter Ext      : pid (pid)
Login Target Filter Function : on
```

When the version of CIM Client isn't 1.29.18-80a and 1.40.18-80a, it does not display "Login Target Filter Ext" and "Login Target Filter Function".

(2) Display information for all hba ports.

If you specify "-p all" parameter to the hfcvmutil command, it displays system-wide parameter values which the driver is currently using. The character "-" means that user-configured value is not currently working as a system-wide parameter value.

CIM Client version earlier than 1.42.19-100a

```
# ./hfcvmutil -p all
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
--------------------------------------------------------
Settings for all HBA ports
--------------------------------------------------------
Max Transfer Size          : - MB
Link Down Time             : - sec
Reset Delay Time           : - sec
Machine Check              : -
Reset Timeout              : - sec
Abort Timeout              : - sec
Target Restrain            : -
Queue Depth                : -
Interrupt type             : -
Logging Mode               : -
Login Target Filter        : -
Link Reset Mode            : -
NPIV vport count           : -
Exchange per Core          : -
Additional Performance Monitor: -
Multi queue                : -
```

CIM Client version 1.42.19-100a or later

When vmklinux driver and native driver are installed in ESXi host, each driver's information will be displayed.

```
# ./hfcvmutil -p all
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
--------------------------------------------------------
Settings for all HBA ports (hfcldd)
--------------------------------------------------------
Max Transfer Size            : - MB
Link Down Time               : - sec
Reset Delay Time             : - sec
Machine Check                : -
Reset Timeout                : - sec
Abort Timeout                : - sec
Target Restrain              : -
Queue Depth                  : -
Interrupt type               : -
Logging Mode                 : -
Login Target Filter          : -
Link Reset Mode              : -
NPIV vport count             : -
Exchange per Core            : -
Additional Performance Monitor: -
Multi queue                  : -


--------------------------------------------------------
Settings for all HBA ports (hfcndd)
--------------------------------------------------------
Max Transfer Size            : - MB
Link Down Time               : - sec
Reset Delay Time             : - sec
Machine Check                : -
Reset Timeout                : - sec
Abort Timeout                : - sec
Target Restrain              : -
Queue Depth                  : -
Interrupt type               : -
Logging Mode                 : -
Login Target Filter          : -
Link Reset Mode              : -
NPIV vport count             : -
Exchange per Core            : -
Additional Performance Monitor: -
Multi queue                  : -
```

(3) Modify a parameter value for specified vmhba port.

```
# ./hfcvmutil -p vmhba2 qd 20
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
Succeeded.
You must reboot your host for the changes to take effect.

# ./hfcvmutil -p vmhba2
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
---------------------------------------------------------
vmhba2 (hfcldd0)  WWPN: 50000870005b4312  [LinkUp]
---------------------------------------------------------
...
Queue Depth          : 32 (20)
...
```

> Queue Depth parameter requires rebooting to activate the new parameter value, so the effective value remains 32 but specified parameter value is saved to the ESXi host. If you want to activate the new parameter value, reboot the host.

(4) Delete a parameter value for specified vmhba port.

```
# ./hfcvmutil -p delete vmhba2 qd force
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
Succeeded.
You must reboot your host for the changes to take effect.

# ./hfcvmutil -p vmhba2
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
---------------------------------------------------------
vmhba2 (hfcldd0)  WWPN: 50000870005b4312  [LinkUp]
---------------------------------------------------------
...
Queue Depth          : 32 (-)
...
```

(5) Modify parameter values for all ports.

```
# ./hfcvmutil -p all qd 20
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
Succeeded.
You must reboot your host for the changes to take effect.

# ./hfcvmutil -p all
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
------------------------------------------------------
Settings for all HBA ports
------------------------------------------------------
Queue Depth          : 20
...
```

(6) Delete parameter values for all ports

```
# ./hfcvmutil -p delete all qd force
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
Succeeded.
You must reboot your host for the changes to take effect.

# ./hfcvmutil -p all
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
------------------------------------------------------
Settings for all HBA ports
------------------------------------------------------
...
Queue Depth          : -
...
```

(7) Set "Login Target Filter Function" to "off" for all ports

```
# ./hfcvmutil -p all
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
-----------------------------------------------------
Settings for all HBA ports
-----------------------------------------------------
...
Login Target Filter        : -
...

[Note] If it is "pid", you execute following command.

# ./hfcvmutil -p delete all tf
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
Succeeded.
Applying parameters setting to the driver....
Succeeded.

# ./hfcvmutil -p all
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
-----------------------------------------------------
Settings for all HBA ports
-----------------------------------------------------
...
Login Target Filter        : -
...
```

not "pid"

```
# ./hfcvmutil -p all tfx no
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
Succeeded.
You must reboot your host for the changes to take effect.
Applying parameters setting to the driver....
Succeeded.

[Note] If it displays "You must reboot your host for the changes to take effect.",
you reboot ESXi host.

# ./hfcvmutil -p vmhba2
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
-----------------------------------------------------------
vmhba2 (hfcldd0)  WWPN: 500008700056a624  [LinkUp]
-----------------------------------------------------------
...
Login Target Filter          : none (-)
Login Target Filter Ext      : none (none)
Login Target Filter Function : off
...
```

Execute about all vmhba number

It is "off".

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If "Login Target Filter Function" is still "on", please execute following command.

```
# ./hfcvmutil -p vmhba2
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
-----------------------------------------------------------
vmhba2 (hfcldd0)  WWPN: 500008700056a624  [LinkUp]
-----------------------------------------------------------
...
Login Target Filter           : pid (pid)
Login Target Filter Ext       : none (none)
Login Target Filter Function  : on          ◄────
...

# ./hfcvmutil -p delete vmhba2 tf          ◄────
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
Succeeded.
Applying parameters setting to the driver....
Succeeded.

# ./hfcvmutil -p vmhba2
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
-----------------------------------------------------------
vmhba2 (hfcldd0)  WWPN: 500008700056a624  [LinkUp]
-----------------------------------------------------------
...
Login Target Filter           : none (-)
Login Target Filter Ext       : none (none)
Login Target Filter Function  : off
...
```

The value of vmhba2 is still "on"

Delete the value of vmhba2.

(8) Set "Login Target Filter Function" to "off" for specified vmhba port.

Example) Target vmhba number is 4Gbps FC-HBA of 8Gbps FC-HBA.

```
# ./hfcvmutil -p delete vmhba2 tf
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
Succeeded.
Applying parameters setting to the driver....
Succeeded.

# ./hfcvmutil -p vmhba2 tfx no
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
Succeeded.
You must reboot your host for the changes to take effect.

[Note] Reboot ESXi host.

# ./hfcvmutil -p vmhba2
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
---------------------------------------------------------
vmhba2 (hfcldd0)  WWPN: 500008700056a624  [LinkUp]
---------------------------------------------------------
...
Login Target Filter          : none (none)
Login Target Filter Ext      : none (none)
Login Target Filter Function : off          ←            The value is "off".
...
```

Example) Target vmhba number is 16Gbps FC-HBA.
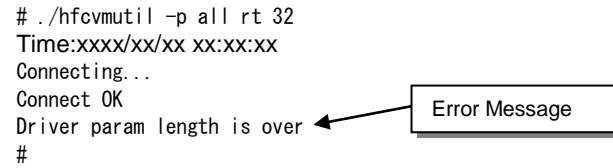
```
# ./hfcvmutil -p vmhba2 tfx no
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
Succeeded.
Applying parameters setting to the driver....
Succeeded.

# ./hfcvmutil -p vmhba2
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
---------------------------------------------------------
vmhba2 (hfcldd0)  WWPN: 500008700056a624  [LinkUp]
---------------------------------------------------------
...
Login Target Filter Ext      : none (none)
Login Target Filter Function : off          ←            The value is "off".
...
```

[Notes]

(1) The number of configurable parameter value has an upper limit. If the parameters are reached the limit, the message shown below will be displayed.

```
# ./hfcvmutil -p all rt 32
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
Driver param length is over        ← Error Message
#
```

If you see this message, delete not-needed parameter configuration or delete configurations of not used ports. For details, refer to the section "Update or Delete port-specific configuration".

❑ hfcvmutil that does not support 16Gbps Fibre Channel Adapter

This section refers to the hfcvmutil that does not support 16Gbps Fibre Channel Adapter (version earlier than 1.40.18-60a). For the other versions of hfcvmutil that supports 16Gbps Fibre Channel Adapter, please refer to p37. You can check hfcvmutil version by executing a command, "hfcvmutil -g". For details, refer to "Display General Information".

[Function] Display or Set the Port Information: You can configure system-wide driver parameters.
[Syntax]

<Display> hfcvmutil [<target IP address> <username> <password> {yes|no}] -p {<vmhba>|all}

If you specify "-p <vmhba>" as an argument of this command, then it shows you the specified and currently working parameter values of a port.
If you specify "-p all" as an argument of this command, it shows, sets, or deletes the parameters on all adapter ports in the OS. The parameters specified to each port or to the all system are stored in /etc/vmware/esx.conf in the ESXi system.

<Set/Delete> hfcvmutil -p [<target IP address> <username> <password> {yes|no}] -p [delete] <options>...

If you specified "-p <option> <available parameter for the option (unit)>" to hfcvmutil command, you can modify the system-wide parameters in the Option List Table below. Note that you cannot set port-specific value.

If you specified "-p delete <option>" to hfcvmutil command, you can delete the system-wide parameters in the Option List Table below.

You must reboot ESXi right after updating the driver, before you change any one of the parameters. The changed driver parameter values before reboot after updating the driver are stored to /etc/vmware/esx.conf but it will not be reflected to the driver behavior after next reboot.

Available parameter names and its values are displayed in the Option List Table below.
In the table, [4Gbps], [8Gbps], [16Gbps] represents 4Gbps FC-HBA, 8Gbps FC-HBA, 16Gbps FC-HBA. Those words are described in the entries that have some difference on the adapter type.

[Columns of the Option List Table]

■ "Option", "Configurable values (unit)"

It indicates Configurable Option names and parameter values.

[Example] Set Max Transfer Size of a 8Gbps FC-HBA to 32MB

```
# ./hfcvmutil -p mt 32
Time:2014/05/26 20:52:13
 :
 :
```

The option name defined in the Option List Table.

A value described in the configurable option field in the Option List Table. Do not specify any unit to specify parameter values.

■ Indicated item name

It indicates the strings appeard in the display command "(hfcvmutil -p [{<logical-device-name>|all}])" of the section "Display or Set Port Parameters". For details, refer to the same entry name in the section "Driver parameters".

■ Configurable Adapter

There are some parameters that can only be configurable on a specific Adapter. The parameter configurable only on 16Gbps FC-HBA have a character "Y" on the "[16Gbps]" column. The parameter configurable only on 8Gpbs or lesser FC-HBAs have a character "Y" on the "[Lesser than 8Gbps]" column. If the parameter you want to change have a character "N" on the column of your type of FC-HBA, you cannot set the parameter value.

■ Deletable

This column shows whether you can delete the specified parameter value or not. A character "Y" means you can delete the parameter value, and "N" means you cannot delete the parameter value. You can rollback once configured parameter value to a default value by deleting the previously configured value. The parameters with a character "Y" in the "Reboot required" column are not changed until the next reboot.

■ Default value

This column shows a default parameter value effective on environments without any configured parameters or with deleted parameters.

■ Reboot required

This column shows a system reboot is required or not when you changed the parameter value. A character "Y" means that the system needs to be rebooted if you changed the paramter value and want to activate it. A character "N" means that changed parameter value is activated on the system immediately. For details of the parameters with a character "N", refer to the section **column**.

Option List Table

Option	Configurable values (unit)	Indicated item name	Configurable Adapters		Deletable	Default value	Reboot required
			[Lesser than 8Gbps]	[16Gbps]			
mt	1 4 8 16 32 (MB)	Max Transfer Size	Y	N	Y	16	Y
ld	0-60 (sec)	Link Down Time	Y	N	Y	15	Y
rd	0-60 (sec)	Reset Delay Time	Y	N	Y	7	Y
mc	0-10 (times)	Machine Check	Y	N	Y	8	Y
rt	0-60 (sec)	Reset Timeout	Y	N	Y	20	Y
at	0-60 (sec)	Abort Timeout	Y	N	Y	8	Y
qd	1-256	Queue Depth	Y	N	Y	32	Y
ir	int msi msix	Interrupt Type	Y	N	Y	int	Y
lm	def disable	Logging Mode	Y	N	Y	def	N
tf	no pid	Login Target Filter	Y	N	Y	no	N

[Example]

(1) Display information for specified vmhba port.
   If you specified a vmhba port to hfcvmutil command, it displays the currently working parameter values of the specified port.

```
# ./hfcvmutil -p vmhba10
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
-------------------------------------------------------------
vmhba10 (hfcldd0)  WWPN: 5000087000573500  [LinkUp]
-------------------------------------------------------------
Connection Type       : Point to Point (fabric)
Link Speed          : 8Gbps
Login Delay Time      : 2 sec
Max Transfer Size     : 16 MB
Link Down Time       : 15 sec
Reset Delay Time      : 7 sec
Machine Check        : 8
Reset Timeout        : 20 sec
Abort Timeout        : 8 sec
Queue Depth         : 32
Interrupt Type       : Legacy Mode
Logging Mode         : disable
Login Target Filter    : pid
```

(2) Display information for all hba ports.

   If you specify "-p all" parameter to the hfcvmutil command, it displays system-wide parameter values which the driver is currently using. The character "-" means that user-configured value is not currently working as a system-wide parameter value.

```
# ./hfcvmutil -p all
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
-----------------------------------------------------
Settings for all HBA ports
-----------------------------------------------------
Max Transfer Size    : 16 MB
Link Down Time       : 15 sec
Reset Delay Time     : - sec
Machine Check            : 8
Reset Timeout        : 20 sec
Abort Timeout        : 8 sec
Queue Depth         : 32
Interrupt type       : -
Logging Mode         : -
Login Target Filter  : -
```

(3) Modify a parameter value for specified vmhba port.

```
# ./hfcvmutil -p qd 20
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
Succeeded.
You must reboot your host for the changes to take effect.

# ./hfcvmutil -p all
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
----------------------------------------------------
Settings for all HBA ports
----------------------------------------------------
Queue Depth        : 20
...
```

(4) Delete a parameter value.

```
# ./hfcvmutil -p delete qd force
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
Succeeded.
You must reboot your host for the changes to take effect.

# ./hfcvmutil -p all
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
----------------------------------------------------
Settings for all HBA ports
----------------------------------------------------
...
Queue Depth        : -
...
```

(5) For example: Set "def" as a Logging Mode or Target Filter setting parameter value.

```
# ./hfcvmutil -p lm def
Time:xxxx/xx/xx xx:xx:xx
Succeeded.
Applying Logging Mode setting to the driver....
(If hfcvmutil succeed to reflect the specified value to the driver, the message shown
below is displayed.)
Succeeded.

(If hfcvmutil failed to reflect the specified value to the driver, the message shown
below is displayed.)
hfcldd0 Failed to apply parameter immediately
Failed.

<Notice>
If you specified the parameters "lm" or "tf" without other parameters, above message
is displayed. If you specified parameters other than "lm" or "tf" with them, then the
following message are displayed.

You must reboot your host for the changes to take effect.
Applying Logging Mode setting to the driver....
```

Display Boot Information

❑ **hfcvmutil that supports 16Gbps Fibre Channel Adapter**

This section refers to the hfcvmutil that supports 16Gbps Fibre Channel Adapter (version 1.40.18-60a or later). For the other versions of hfcvmutil that do not support 16Gbps Fibre Channel Adapter, please refer to p63. You can check hfcvmutil version by executing a command, "hfcvmutil -g". For details, refer to "Display General Information".

[Function] Display current Boot settings.
[Syntax]

    <Display> hfcvmutil [<target IP address> <username> <password> {yes|no}]

     -b {<vmhba>|all}

    <Set> hfcvmutil [<target IP address> <username> <password> {yes|no}]

     -b <vmhba> <options>

Configurable Option names and parameter values are shown in Option List Table.

In the table, [4Gbps], [8Gbps], [16Gbps] represents 4Gbps FC-HBA, 8Gbps FC-HBA, 16Gbps FC-HBA. Those words are described in the entries that have some difference on the adapter type.

[Columns of the Option List Table]

Same as described in the section "Display or Set Port Parameters", so refer to the section.

Option List Table

Option	Configurable values (unit)	Indicated item name	Configurable Adapters [Lesser than 8Gbps]	[16Gbps]	Configurable to All ports	Logical devices	Deletable	Default value	Reboot required
bi	enable disable	BIOS	Y	Y	N	Y	N	disable	Y
bp	enable disable	Boot Priority	Y	Y	N	Y	N	disable	Y
ls(*1)	enable disable	Luid scan mode	N	Y	N	Y	N	disable	Y
bd	priority:1-8 wwn:(WWPN) lun: 0-FFFF	boot device	Y	Y	N	Y	N	wwn:all 0 lun:0	Y
sd	enable disable	Spinup Delay	Y	Y	N	Y	N	disable	Y
fd	enable disable	Forced Default Parameter	Y	Y	N	Y	N	disable	Y
wn	(WWPN)	Additional WWPN	Y	Y	N	Y	N	all 0	Y

(*1) Available on CIM Client version 1.42.19-100a or later

[Example 1] Display information for specified vmhba port.

CIM Client version earlier than 1.42.19-100a

```
#hfcvmutil -b vmhba21
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
------------------------------------------------------------
vmhba21 (hfcldd1)  WWPN: 5000087000573500  [LinkUp]
------------------------------------------------------------
BIOS                   : disable
Boot Priority          : disable
      Target WWN         LUN   Priority
--------------------------------------------
   1  0000000000000000   0000      HIGH
   2  0000000000000000   0000
   3  0000000000000000   0000
   4  0000000000000000   0000
   5  0000000000000000   0000
   6  0000000000000000   0000
   7  0000000000000000   0000
   8  0000000000000000   0000      LOW
Spinup Delay           : disable
Forced Default Parameter: disable
Original WWPN          : 50000870005b42e6
Additional WWPN        : 0000000000000000
Pre Configure          : disable
#
```

CIM Client version 1.42.19-100a or later

```
#hfcvmutil -b vmhba21
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
------------------------------------------------------------
vmhba21 (hfcldd1)  WWPN: 5000087000573500  [LinkUp]
------------------------------------------------------------
BIOS                   : enable
Boot Priority          : disable
Luid scan mode         : enable
Priority Target WWN       LUN    LUID     LUID data
----------------------------------------------------------------------
HIGH 1  50060e80102521a4  0000   Type1    4142434445464748494A4B4C4D4E4F5051525354
     2  0000000000000000  0000   -        -
     3  0000000000000000  0000   -        -
     4  0000000000000000  0000   -        -
     5  0000000000000000  0000   -        -
     6  0000000000000000  0000   -        -
     7  0000000000000000  0000   -        -
LOW  8  0000000000000000  0000   -        -
Spinup Delay           : disable
Forced Default Parameter: disable
Original WWPN          : 50000870005b4210
Additional WWPN        : 0000000000000000
Pre Configure          : disable
#
```

[Example 2] Modify a parameter value for specified vmhba port.

```
#hfcvmutil -b vmhba4 fd enable
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
Succeeded.
You must reboot your host for the changes to take effect.
#hfcvmutil -b vmhba4
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
------------------------------------------------------------
vmhba4 (hfcldd2)  WWPN: 50000870005b42e4  [LinkUp]
------------------------------------------------------------
BIOS                 : disable
Boot Priority        : disable
       Target WWN         LUN   Priority
----------------------------------------------------
    1   0000000000000000   0000      HIGH
    2   0000000000000000   0000
    3   0000000000000000   0000
    4   0000000000000000   0000
    5   0000000000000000   0000
    6   0000000000000000   0000
    7   0000000000000000   0000
    8   0000000000000000   0000      LOW
Spinup Delay         : disable
Forced Default Parameter: enable
Original WWPN        : 50000870005b42e4
Additional WWPN      : 0000000000000000
Pre Configure        : disable
#
```

[Field definitions]

Item of display	Description
BIOS	HBA BIOS is enabled or disabled. If 'enable', it is used by the boot path.
Boot Proprity	It shows the following boot device list is enabled.
Luid scan mode	Luid scan mode is enabled or disabled. enable : The LU will be searched again with LUID key if it was not found by WWN/LUN. disable : The LU will be not serched again if it was not found by WWN/LUN. N/A : The card type is under 8Gbps not support : FW is not supported
Boot Device List	This list shows boot device (WWPN and LUN) and its proprity as boot device. CIM Client version 1.42.19-100a or later:: Display the LUID information.(Refer to the following)
LUID	Type1,Type3 : LUID data types - : unacquired or not supported Invalid : Not supported on the device N/A : Unusable because the card type is under 8Gbps.
LUID data	Display the information of LUID N/A : Unusable because the card type is under 8Gbps.
Spinup Delay	If 'enable', spinup waiting time is inserted until the disk becomes ready.
Forced Default Parameter	If 'enable', driver uses default value ignoring the settings in /etc/vmware/esx.conf.
Original WWPN	It shows the WWPN stored on FLASH-ROM of the Adapter. The value corresponds to indicated WWPN on the adapter body (the white label).
Additional WWPN	Additional WWPN used for Pre-configure function.

[Notes]
(1) You must reboot the host OS to make the newly configured parameters effective.
(2) FLASH-ROM data is updated when you set parameters. While the command is being executed, do not close the operation Window, terminate the command forcibly, or perform operations such as turning off the power of the server unit or rebooting. The FLASH-ROM data may be destroyed and HBA becomes unavailable.

❑ hfcvmutil that does not support 16Gbps Fibre Channel Adapter

This section refers to the hfcvmutil that does not support 16Gbps Fibre Channel Adapter (version earlier than 1.40.18-60a). For the other versions of hfcvmutil that supports 16Gbps Fibre Channel Adapter, please refer to p58. You can check hfcvmutil version by executing a command, "hfcvmutil -g". For details, refer to "Display General Information".

[Function] Display current Boot settings.
[Syntax]

   <Display> hfcvmutil [<target IP address> <username> <password> {yes|no}]

   -b {<vmhba >|all}

[Example]

```
#hfcvmutil -b vmhba21
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
-----------------------------------------------------------
vmhba21 (hfcldd1)   WWPN: 5000087000573500  [LinkUp]
-----------------------------------------------------------
BIOS                 : enable
Boot Priority        : enable
     Target WWN        LUN    Priority
-----------------------------------------------------
  1   50060E8000c27995  0000    HIGH
  2   0000000000000000  0000
  3   0000000000000000  0000
  4   0000000000000000  0000
  5   0000000000000000  0000
  6   0000000000000000  0000
  7   0000000000000000  0000
  8   0000000000000000  0000    LOW
Spinup Delay         : disable
Connection Type      : Auto     <-displayed on ver1.40.16-40a or later.
Data rate            : Auto     <-displayed on ver1.40.16-40a or later.
Persistent Bindings  : enable
Forced Default Parameter: disable
Login Delay Time     : default  <-displayed on ver1.40.16-40a or later.
```

[Field definitions]

Item of display	Description
BIOS	HBA BIOS is enabled or disabled. If it is set to "enable", then the port is available for boot path.
Boot Proprity	It shows the following boot device list is enabled.
Boot Device List	This list shows boot device (WWPN and LUN) and its proprity as boot devie.
Spinup Delay	If 'enable', spinup waiting time is inserted until the disk becomes ready.
Connection Type	Topology settings when connecting the adapter port to the device. The section,"Display or Set Port Parameters" enables you to display the current connection type of the adapter port.
Data rate	Link speed to connect this product to the device. "Display or Set Port Parameters" refer to link speed which the driver is currently in operation.
Persistent Bindings	Persistent binding function availability (N/A)
Forced Default Parameter	If 'enable', driver uses default value ignoring the settings in /etc/vmware/esx.conf.
Login Delay Time	Delay time if login to the device needs to be delayed. "Display or Set Port Parameters" refer to delay time which the driver is currently in operation.

Back up or Update FLASH-ROM

[Function] Back up or update FLASH-ROM.

[Syntax]

<Backup>

hfcvmutil [<target IP address> <username> <password> {yes|no}] -f <vmhba> backup [force]

The backup file is store on /tmp directory on ESXi and it is not transferred to the local directory on remote client. Please get the backup file if necessary.

<Upgrade>

hfcvmutil [<target IP address> <username> <password> {yes|no}] -f <vmhba> update <Update file name> [force]

To update the FLASH-ROM on ESXi 5.0, 5.1, or 5.5, store the update file on the remote client where the CIM client is executed, before executing the update command. For <Update file name>, specify either the absolute path of the stored update file or the relative path to the CIM client execution directory.

To update the FLASH-ROM on ESXi 6.0 or later, store the update file on the target ESXi host before executing the update command. For <Update file name>, specify the absolute path of the stored update file.

      force   # Omit the (y/n) confirmation message to execute the command

[Example 1] The following is an example of executing the FLASH-ROM backup command, and then transferring the backup file to a remote client on ESXi 5.0, 5.1, 5.5, 6.0, or later. The environment is as follows.

Remote client platform	vMA
Host to be backed up	ESXi 6.0 (IP address: 192.168.15.189)
Directory where hfcvmutil is executed	/opt/hitachi/drivers/hba
Backup file	Stored in the directory below on the remote client /home/vi-admin

```
# ./hfcvmutil -pd
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
----------------------------------------------------
vmhba20 (hfcldd0)    WWPN:50000870003022de  [LinkUp]
----------------------------------------------------
Connected targets and Lus:
50060E8000C3F386:0000
 50060E8000C3F386:0001
 50060E8000C3F386:0002

# hfcvmutil -f vmhba20 backup
Connecting...
Connect OK

Port : vmhba20

Do you execute it?(y/n) >y


Time:xxxx/xx/xx xx:xx:xx
Success.
backup file is /tmp/54102030.30043c.ef.500008700056a454.bk

# scp root@192.168.15.189:/tmp/54102030.30043C.EF.500008700056A454.BK /home/vi-admin/.
Password:
54102030.30043C.EF.500008700056A454.BK       100% 1103KB   1.1MB/s   00:00
#
```

transfer the backup file to another host.

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[Example 2] The following is an example of executing the FLASH-ROM update command on ESXi 5.0, 5.1, or 5.5. The environment is as follows.

remote client platform	vMA
Host to be updated	ESXi 5.5 (IP address: 192.168.15.189)
Directory where hfcvmutil is executed	/opt/hitachi/drivers/hba
update file	Already stored in the directory below on the remote client /opt/hitachi/drivers/hba/firmware/54102030.00300504.E7

```
# ls firmware/
54102030.00300504.E7
# hfcvmutil -f vmhba20 update firmware/54102030.00300504.E7
Connecting...
Connect OK
Firmware update file : firmware/54102030.00300504.E7

Port : vmhba20
Current Version : xxxxx
New Version     : yyyyy

Do you execute it? (y/n) >y

Time:xxxx/xx/xx xx:xx:xx
Success.
#
```

If the update file (firmware/54102030.00300504.E7) specified by the command does not exist on the remote client, the error message "No such file" is generated, as shown below. In such a case, make sure the specified update file exists on the remote client.

```
# hfcvmutil -f vmhba20 update firmware/54102030.00300504.E7
Connecting...
Connect OK
Firmware update file : firmware/54102030.00300504.E7

Port : vmhba20
No such file.
#
# ls firmware/54102030.00300504.E7
ls: cannot access firmware/54102030.00300504.E7: No such file or directory
#
```

[Example 3] The following is an example of executing the FLASH-ROM update command on ESXi 6.0 or later. The environment is as follows.

Remote client platform	vMA
Host to be updated	ESXi 6.0 (IP address: 192.168.15.189)
Directory where hfcvmutil is executed	/opt/hitachi/drivers/hba
update file	Already stored in the directory below on vMA /opt/hitachi/drivers/hba/firmware/54102030.00300504.E7

```
# scp /opt/hitachi/drivers/hba/firmware/54102030.00300504.E7 root@192.168.15.189:/tmp
Password:
54102030.00300504.E7          100% 1028KB   1.0MB/s   00:00     ◄─── The update file is
# hfcvmutil -f vmhba20 update /tmp/54102030.00300504.E7              transferred to the ESXi
Connecting...                                                       host.
Connect OK
Firmware update file : /tmp/54102030.00300504.E7

Port : vmhba20
Current Version : xxxxx
New Version     : yyyyy

Do you execute it? (y/n) >y

Time:xxxx/xx/xx xx:xx:xx
Success.
#
```

If the update file (/tmp/54102030.00300504.E7) specified by the command does not exist on the ESXi host, the error message "No UpdateFile Failed." is generated, as shown below. In such a case, make sure the specified update file exists on the ESXi host.

```
# hfcvmutil -f vmhba20 update /tmp/54102030.00300504.E7
Connecting...
Connect OK
Firmware update file : /tmp/54102030.00300504.E7

Port : vmhba20
No UpdateFile Failed.
#
# ssh root@192.168.15.189
Password:
 :
[root@localhost:~] ls /tmp/54102030.00300504.E7
ls: /tmp/54102030.00300504.E7: No such file or directory
[root@localhost:~]
```

[Notes]

(1) After FLASH-ROM update is successfully completed, you need to transfer the FLASH-ROM data into the hardware of the Hitachi Gigabit Fibre Channel Adapter either by Off-line or On-line. Off-line means that you first update the FLASH-ROM and turn the Power off of your system. Then FLASH-ROM data is transferred from FLASH-ROM to the hardware when the system is booted. On-line means that the executing the special commands transfer the FLASH-ROM data to the hardware without turning the power off and on. Refer to 'HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Linux/VMware Driver Edition)' for details.

(2) Download the latest firmware from the web site.

　　http://www.hitachi.co.jp/products/bladesymphony/download/driver/frm.html

(3) Back up the firmware before updating the firmware.

(4) When updating FLASH-ROM, do not close the working window, terminate the command forcibly, turn the power off or reboot the system. There operation causes the disruption of the FLASH-ROM and may lead the failure of the Hitachi Gigabit Fibre Channel Adapter.

(5) If this operation failed with error message, please refer 'HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Utility Software Edition)' for details.

Display target information

[Function] Display target information.

[Syntax]

hfcvmutil [<target IP address> <username> <password> {yes|no}] -t

[Example]

```
#hfcvmutil -t
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
-------------------------------------------------------
vmhba20 (hfcldd0)    WWPN:50000870003022dc  [LinkDown]
-------------------------------------------------------

   No Target

-------------------------------------------------------
vmhba21 (hfcldd1)    WWPN:500008700056a454 [LinkUp]
-------------------------------------------------------
TargetWWPN: xxxxxxxxxxxxxxxx
  LUN:0000 VENDOR:HITACHI   MODEL:DF600F          SIZE:10MB
  LUN:0001 VENDOR:HITACHI   MODEL:DF600F          SIZE:12MB
  LUN:0002 VENDOR:HITACHI   MODEL:DF600F          SIZE:5MB
  LUN:0003 VENDOR:HITACHI   MODEL:DF600F          SIZE:30MB
-------------------------------------------------------
vmhba22 (hfcldd2)     WWPN:500008700056a456 [LinkUp]
-------------------------------------------------------
TargetWWPN: xxxxxxxxxxxxxxxx
  LUN:0000 VENDOR:SANBlaze MODEL: DF600F          SIZE:10MB
  LUN:0001 VENDOR:SANBlaze MODEL: DF600F          SIZE:12MB
#
```

[Field definitions]

No.	Item of display	Description
1	TargetWWPN	WWPN of target
3	LUN	LU number
4	Size	Size of LU (MB)
5	Vendor	Vendor of target
6	Model	Model of target

Online update of the firmware

[Function] Transfer the FLASH-ROM data into the hardware while system is running.

For detailed procedure, refer to 'HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Linux/VMware Driver Edition)'.

[Syntax]

    <Check online update is applicable>

        hfcvmutil [<target IP address> <username> <password> {yes|no}] -u

    <Online update>

        hfcvmutil [<target IP address> <username> <password> {yes|no}} -u

        <vmhba> [force]

   <options>

              force   # Omit the (y/n) confirmation message at time of delete

[Example]

```
# ./hfcvmutil -pd
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
-----------------------------------------------------
vmhba20 (hfcldd0)    WWPN:50000870003022de  [LinkUp]
-----------------------------------------------------
Connected targets and Lus:
50060E8000c3f386:0000
50060E8000c3f386:0001
50060E8000c3f386:0002
...

# hfcvmutil -u
Connecting...
Connect OK
Time:xxxx/xx/xx xx:xx:xx
vmhba    hfcldd    BUS/DEV/FUNC Flash    Current  Update-Status(Flash -> Current)
vmhba20 hfcldd0   01  01  00    00220750 00220740  Applicable
vmhba21 hfcldd1   02  01  00    00220750 00220740  Applicable
vmhba22 hfcldd2   03  01  00    00120700 00120700  NG (Unsupported)
vmhba30 hfcldd3   04  01  00    00120700 00120700  NG (Inapplicable - FW)
vmhba31 hfcldd4   05  01  00    00220710 00220500  NG (Inapplicable - HW)
vmhba32 hfcldd5   06  01  00    00220700 00220500  Applicable
```

```
# hfcvmutil -u vmhba20
Connecting...
Connect OK
Time:xxxx/xx/xx xx:xx:xx
PORT NO : vmhba20
FLASH   SYSREV:00220750
CURRENT SYSREV:00220740

FLASH-> CURRENT Update is OK? (y/n) >y

Update command finished (Port vmhba20). please check the F/W update status.
```

The detail of the 'Update-Status(Flash -> Current)' is as follows.

'Update-Status'	Meaning
Applicable	Firmware online update is applicable.
No need	Hitachi Gigabit Fibre Channel Adapter hardware has already updated by this version of the update file. You do not need to execute online update.
Waiting	Firmware update operation has been already initiated. You are now waiting to complete the operation.
Waiting(w---)	Firmware update operation has been already initiated. You are now waiting to complete the operation. If you are using 16Gbps Fibre Channel Adapters, additional information "(w---)" is displayed. "w" indicates that there is a firmware waiting to be updated. The number of "w" or "-" is defferent depending on the Adapter type. This type of indication is used when you are using utility software that supports 16Gbps Fibre Channel Adapter and updating 16Gbps Adapters.
NG(Unsupported)	This firmware is not covered by firmware online update function. You have to transfer the FLASH-ROM data by off-line.
NG(Inapplicable - FW)	This firmware includes the update information which is not applicable by on-line. You have to transfer the FLASH-ROM data by off-line.
NG(Inapplicable - HW)	Specified firmware includes the hardware setting which is not applicable by on-line. You have to transfer the FLASH-ROM data by off-line.
NG(Unsupported HBA)	This Gigabit Fibre Channel boaord does not support firmware online update function. You have to transfer the FLASH-ROM data by off-line.

For error messages when this operation terminates abnormally, please refer 'HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Utility Software Edition)' for details.

Isolate or Recover adapter port

[Function] Isolate or recover adapter port when replace SFP transceiver while system is running. Some models of Hitachi Gigabit Fibre Channel Adapter products don't have SFP hot-swap feature. Refer to HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Support Matrix Edition).

For detailed procedure, refer to 'HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Linux/VMware Driver Edition)'.

[Syntax]

    <Isolate>
        hfcvmutil [<target IP address> <username> <password> {yes|no}] -is -i
            <vmhba> [force]

    <Recover>
        hfcvmutil [<target IP address> <username> <password> {yes|no}] -is -i
            <vmhba> clear [force]

    <options>
                force   # Omit the (y/n) confirmation message at time of delete

[Example]

[Example 1]

(1) Display and confirm SFP Status.

```
# ./hfcvmutil -g
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
                 :
vmhba20 (hfcldd0)  WWPN:50000870003022dc Location:08:01.00 Status:LinkUp
 SFP Part Number    : FTLF8524P2BNV-HD
     Serial Number  : PF43KR7
     Date Code      : 090124
     Transceiver Replacement : not replaceable
vmhba21 (hfcldd1) WWPN:50000870003022de Location:08:01.01 Status:LinkUp
 SFP Part Number    : FTLF8524P2BNV-HD
     Serial Number  : PES437S
     Date Code      : 090124
     Transceiver Replacement : not replaceable
```

[Error Messages]

(a) Firmware does not support SFP transceiver hot-swap.

  The following error message is isplayed and the command does not display SFP Part Number, Serial Number and Date code. Update firmware of the adapter.

  This Firmware version does not support hot swap feature of SFP Transceiver.

(b) SFP is not plugged or SFP is not embedded.

 'N/A's are displayed as SFP Part Number, Serial Number and Date code. Comfirm whether SFP is plugged.

```
 SFP Part Number   : N/A
     Serial Number : N/A
     Date Code     : N/A
```

(c) Failed to read SFP information.

'incorrect data's are displayed as SFP Part Number, Serial Number and Date code. SFP may be damaged. Replace SFP transceiver.

```
SFP Part Number     : incorrect data(xxxxxxxx)
    Serial Number : incorrect data
    Date Code     : incorrect data
```

[Example 2]

Isolate HBA port (vmhba20) to replace SFP. If the command successfully terminated, port status changes to 'Isolate (C)' and the item 'Transceiver replacement' is changed to 'replaceable'.

```
# hfcvmutil -is -i vmhba20
The adapter port is going to be isolated.
This operation may affect operations running on the adapter.
Do you really isolate the adapter port? (y/n) > y

Succeeded.

# ./hfcvmutil -g
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
                  :
vmhba20 (hfcldd0)  WWPN:50000870003022dc Location:08:01.00  Status:Isolate(C)
 SFP Part Number   : FTLF8524P2BNV-HD
     Serial Number : PF43KR7
     Date Code     : 090124
     Transceiver Replacement : replaceable
```

[Example 3]

After you replace SFP transceiver, execute recover command. If the command succeeded, port status changes from Isolate(C) to Linkdown or Linkup. This means now you can connect the adapter port through replaced SFP transceiver.

```
# hfcvmutil -is -i vmhba20 clear
The adapter port is going to be recovered.
Do you really restore the adapter state? (y/n) > y


Succeeded.


# ./hfcvmutil -g
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK
                       :

vmhba20 (hfcldd0)  WWPN:50000870003022dc Location:08:01.00 Status: LinkUp
 SFP Part Number   : FTLF8524P2BNV-HD
     Serial Number : PES437S
     Date Code     : 090124
     Transceiver Replacement : not replaceable

```

Initiate Target Scan

[Function] If you execute on this command in the system configuration which FC-SAN disk is connected through FC-Switch, the driver initiates to scan process of the target then it can detect new target.

When ESXi has already identified the target and only LUs are added or removed, the driver does not detect added or removed LUs when executing this command. In such case, execute rescan operation on vSphere Client or execute 'esxcfg-rescan vmhba*' (*:HBA port vmhba number) in the ESXi shell to detect these LUs.

In the following cases, the new target is detected by the driver without executing this command.

- When RSCN is reported to the adapter, such as 1) cables is plugged or unplugged between the adapter port to FC-Switch, or FC-Switch to the FC-SAN disk, or 2) zoning is changed in FC-Switch.

- The FC-SAN disk has a feature to send RSCN to the adapter when changing LUN security.

[Syntax]
hfcvmutil <target IP address> <username> <password> {yes|no}] -scan {vmhba|all}

[Example]

The following examples include when specifying the vmhba number or all ports in this command.

```
# hfcvmutil -scan vmhba20    (When vmhba number is specified)

Succeeded.    <- Operation is succeeded.

#hfcvmutil -scan all (When 'all' is specified)
Time:20xx/11/22 15:10:30
hfcldd1: Operation is not supported
hfcldd2: Adapter port busy, please try again.
hfcldd3: IOCTL error
Failed. *1)
```

*1) If the driver fails to initiate scan process for any of the ports in the system, the message 'Failed' is displayed. And the detailed message shows the reason why the scan process failed in the port.

No.	Messages	Details
1	Adapter port is in Linkdown state.	Skip initiating scan process because the port is in Linkdown state.
2	Operation is not supported	The port connection in your system is not covered in this command.
3	Adapter port is busy. Retry later	The driver is busy executing other process. Please retry later .
4	IOCTL Error	The driver failed to execute IOCTL command. Please retry later .
5	Operation failed	An error occurred. Please retry later .

2) 4Gbps and 8Gbps FC-HBA does not support 'esxcli storage [fc/fcoe/sas] reset -A vmhba(*:HBA port vmhba number)'. If you execute 'hfcvmutil -scan', driver can detect new target without a reboot.

Backup HBA BIOS settings

[Function] Take backup from the current setup data for HBA BIOS.

[Syntax]

hfcvmutil <target IP address> <username> <password> {yes|no}] -bk <vmhba>
[force]

The backup file is stored on /tmp directory on ESXi and it is not transfered. You should
move this file from ESXi to local host by using scp, etc.

       force   # Omit the (y/n) confirmation message to execute the command

[Example]

```
# hfcvmutil -bk vmhba2
Connecting...
Connect OK

Port : vmhba2

Do you execute it?(y/n) > y

Time:xxxx/xx/xx xx:xx:xx
Success.
backup file is /tmp/300B1054.05.04.00.00.BK
Done.

# scp root@192.168.10.23:/tmp/300B1054.05.04.00.00.BK /root/
Password:
300B1054.05.04.00.00.BK                          100% 1360
1.3KB/s   00:00
#
```

Get backup file by manual from ESXi

[Notes]

(1) You may not be able to obtain correct data if executed on the adapter not running correctly. Take note that the adapter may not be able to operate correctly if you restore the data.

(2) When the CIM client version is 1.xx.18-60a or later, the backup content is displayed. Refer here for the display contents.

```
# hfcvmutil -bk vmhba2
Connecting...
Connect OK
---------------------------------------------
vmhba2 (hfcldd2)  WWPN: 50000870005b4210  [LinkDown]
-----------------------------------------------------
BIOS               : disable
Boot Priority      : disable


      Target WWN         LUN    Priority
--------------------------------------------------
   1   50060e80102521a0  0000     HIGH
   2   0000000000000000  0000
   3   0000000000000000  0000
   4   0000000000000000  0000
   5   0000000000000000  0000
   6   0000000000000000  0000
   7   0000000000000000  0000
   8   0000000000000000  0000     LOW

Spinup Delay       : disable
Connection Type    : Auto
Data rate          : Auto
Persistent Bindings  : enable
Forced Default Parameter: disable
Additional WWPN    : 0000000000000000
Login Delay Time   : default
Pre Configure      : disable

Port : vmhba2

Do you execute it?(y/n) > y

Time:xxxx/xx/xx xx:xx:xx
Success.
backup file is /tmp/300B1054.05.04.00.00.BK
Done.

#
```

The backup content is displayed.

Restore HBA BIOS settings

[Function] Restore the setup data for HBA BIOS to the value of the restore file.

[Syntax]

hfcvmutil <target IP address> <username> <password> {yes|no}] -rs <vmhba>
<Restore file name> [force]

Use the backup file created in "Backup HBA BIOS settings" as the restore file.

To restore the HBA BIOS settings on ESXi 5.0, 5.1, or 5.5, store the restore file on the
remote client where the CIM client is executed, before executing the restore command.
For <Restore file name>, specify either the absolute path of the stored restore file or the
relative path to the CIM client execution directory.

To restore the HBA BIOS settings on ESXi 6.0 or later, store the restore file on the
target ESXi host before executing the restore command. For <Restore file name>,
specify the absolute path of the stored restore file.

    force # Omit the (y/n) confirmation message to execute the command

[Example1] The following is an example of executing the restore command on ESXi 5.0, 5.1, or 5.5. The environment is as follows.

remote client platform	vMA
Host to be restored	ESXi 5.5 (IP address: 192.168.15.189)
Directory where hfcvmutil is executed	/opt/hitachi/drivers/hba
restore file	Stored in the directory below on the remote client /opt/hitachi/drivers/hba/backup/300B1054.05.04.00.00.BK

```
# hfcvmutil -rs vmhba0 backup/300B1054.05.04.00.00.BK
Connecting...
Connect OK
Bios Parameter restore file : backup/300B1054.05.04.00.00.BK

Port : vmhba0

Do you execute it?(y/n) > y

Time:xxxx/xx/xx xx:xx:xx
Success.
Done.
#
```

If the restore file (backup/300B1054.05.04.00.00.BK) specified by the command does not exist on the remote client, the error message "No such file" is generated, as shown below. In such a case, make sure the specified restore file exists on the remote client.

```
# hfcvmutil -rs vmhba0 backup/300B1054.05.04.00.00.BK
Connecting...
Connect OK
No such file.
#
# ls backup/300B1054.05.04.00.00.BK
ls: cannot access backup/300B1054.05.04.00.00.BK: No such file or
directory
#
```

[Example2] The following is an example of executing the restore command on ESXi 6.0 or later. The environment is as follows.

remote client platform	vMA
Host to be restored	ESXi 6.0 (IP address: 192.168.15.189)
Directory where hfcvmutil is executed	/opt/hitachi/drivers/hba
restore file	Already stored in the directory below on vMA /opt/hitachi/drivers/hba/backup/300B1054.05.04.00.00.BK

```
# scp /opt/hitachi/drivers/hba/backup/300B1054.05.04.00.00.BK
root@192.168.15.189:/tmp
300B1054.05.04.00.00.B        100% 1360       1.3KB/s
# hfcvmutil -rs vmhba0 /tmp/300B1054.05.04.00.00.BK
Connecting...
Connect OK
Bios Parameter restore file : /tmp/300B1054.05.04.00.00.BK


Port : vmhba0


Do you execute it?(y/n) > y


Time:xxxx/xx/xx xx:xx:xx
Success.
Done.
#
```

The restore file is transferred to the ESXi host.

If the restore file (/tmp/300B1054.05.04.00.00.BK) specified by the command does not exist on the ESXi host, the error message "No UpdateFile Failed." is generated, as shown below. In such a case, make sure the specified restore file exists on the ESXi host.

```
# hfcvmutil -rs vmhba0 /tmp/300B1054.05.04.00.00.BK
Connecting...
Connect OK
No UpdateFile Failed.
#
# ssh root@192.168.15.189
Password:
 :
[root@localhost:~] ls /tmp/300B1054.05.04.00.00.BK
ls: /tmp/300B1054.05.04.00.00.BK: No such file or directory
[root@localhost:~]
```

[Notes]

(1) You need to reboot to change the current setup data for HBA BIOS.

(2) FLASH-ROM data is updated when you set parameters. While the command is being executed, do not close the operation Window, terminate the command forcibly, or perform operations such as turning off the power of the server unit or rebooting. The FLASH-ROM data may be destroyed and HBA becomes unavailable.

(3) If the CIM client version is 1.xx.18-60a or later, the restored content is displayed at the time of execution.

Refer here for the display contents.

```
# hfcvmutil -rs vmhba0 /tmp/300B1054.05.04.00.00.BK
Connecting...
Connect OK
--------------------------------------------------------
                                          The restored content is
                                          displayed.
vmhba0 (hfcldd2)  WWPN: 50000870005b4210  [LinkDown]
--------------------------------------------------------
BIOS                    : disable
Boot Priority           : disable


        Target WWN          LUN    Priority
     ---------------------------------------------

     1   50060e80102521a0   0000     HIGH
     2   0000000000000000   0000
     3   0000000000000000   0000
     4   0000000000000000   0000
     5   0000000000000000   0000
     6   0000000000000000   0000
     7   0000000000000000   0000
     8   0000000000000000   0000     LOW


Spinup Delay            : disable
Connection Type         : Auto
Data rate               : Auto
Persistent Bindings     : enable
Forced Default Parameter: disable
Additional WWPN         : 0000000000000000
Login Delay Time        : default
Pre Configure           : disable
Bios Parameter restore file : /tmp/300B1054.05.04.00.00.BK


Port : vmhba0


Do you execute it?(y/n) > y


Time:xxxx/xx/xx xx:xx:xx
Success.
Done.
#
```

Update or Delete port-specific configuration

This function is supported only by hfcvmutil that supports 16Gbps Fibre Channel Adapter (version 1.40.18-60a or later). You can check hfcvmutil version by executing a command, "hfcvmutil -g". For details, refer to "Display General Information".

[Function]
Port-specific configurations such as "hfcvmutil -p / hfcvmutil -is -p" are stored in conjunction with the port's WWPN. This command can replace the old WWPN to the new one in the configurations (*1). Then you can apply the port-specific configurations derived from the old Adapter to the new Adapter. In addition, if you do not need to use the previously configured port-specific parameter values, this command can remove them.

(*1) You cannot modify WWPNs of Adapters.

[Syntax]

    <Update>
        hfcvmutil [<target IP address> <username> <password> {yes|no}] -ex [<WWPN> new <WWPN>]

    <Delete>
        hfcvmutil [<target IP address> <username> <password> {yes|no}] -ex delete [<WWPN>] [force]

[Example]
If <WWPN> is omitted, a list of WWPNs that have port-specific parameter values is displayed, and you can select one of them.

CIM Client version earlier than 1.42.19-100a

```
# hfcvmutil -ex
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK

Select old WWPN
    1: WWPN:50000870005b42e4
    0: Cancel

Enter number(0, 1) > 1

Enter new WWPN(q:Cancel) > 50000870005b4310
Old WWPN:50000870005b42e4 setting value exchange for a New WWPN:50000870005b4310
Succeeded.

# hfcvmutil -ex delete
Connecting...
Connect OK

Select unused WWPN
    1: WWPN:50000870005b4310
    0: Cancel

Enter number(0, 1) > 1

Do you execute it?(y/n) > y

Old WWPN:50000870005b4310 setting value deleted
Succeeded.
```
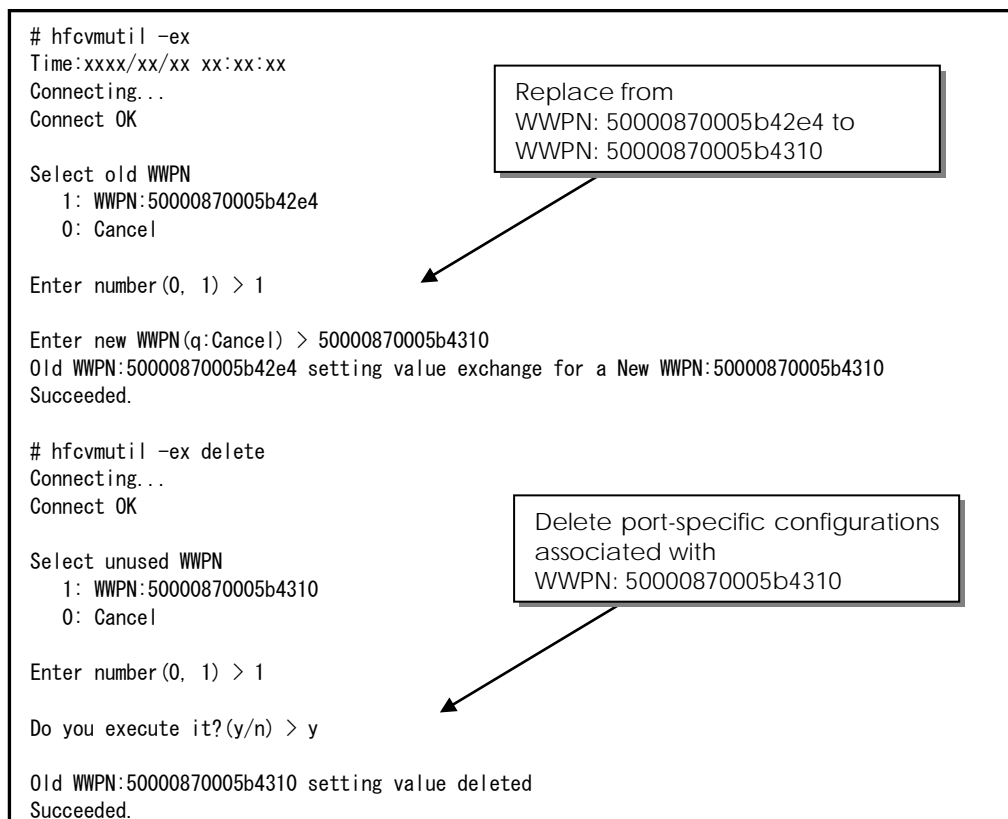
Replace from
WWPN: 50000870005b42e4 to
WWPN: 50000870005b4310

Delete port-specific configurations associated with
WWPN: 50000870005b4310

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```
# hfcvmutil -ex
Time:xxxx/xx/xx xx:xx:xx
Connecting...
Connect OK

Select old WWPN
   1: hfcldd5    WWPN:50000870005736ee
   0: Cancel

Enter number(0, 1) > 1

Enter new WWPN(q:Cancel) > 5000087000573710
Old WWPN:50000870005736ee setting value exchange for a New WWPN:5000087000573710
Succeeded.
You must reboot your host for the changes to take effect.

# hfcvmutil -ex delete
Connecting...
Connect OK

Select unused WWPN
   1: hfcldd5    WWPN:5000087000573710
   0: Cancel

Enter number(0, 1) > 1

Do you execute it?(y/n) > y

Old WWPN:5000087000573710 setting value deleted
Succeeded.
You must reboot your host for the changes to take effect.
```

[Notes]
(1) If you changed the configurations by this command, reboot is required to activate the newly configured parameters.
(2) This command changes port-specific configurations that associated with its WWPN and stored in /etc/vmware/esx.conf. This command does not care for the parameter values stored in FLASH-ROM of the Adapter. Instead, you can apply configurations stored in the FLASH-ROM of previously used Adapter to the new one by the procedure shown in "Backup HBA BIOS settings" and "Restore HBA BIOS settings".

Migration method for each type of configuration parameters

No.	Configuration parameters	Migration method
1	"Display or Set Port Parameters" ・ Connection Type ・ Link Speed ・ Login Delay Time ・ Login Target Filter Ext ・ MCK Link Down Time ・ Link Init Negotiation Time ・ Multiple PortID	Backup HBA BIOS settings Restore HBA BIOS settings
2	"Display or Set Port Parameters" Not listed in above row	Update or Delete port-specific configuration
3	"Display Boot Information"	Backup HBA BIOS settings Restore HBA BIOS settings

Performance Monitor

This function is supported only with hfcvmutil that supports 16Gbps Fibre Channel Adapter (version 1.40.18-60a or later) and 16Gbps Fibre Channel Adapter. You can check hfcvmutil version by executing a command, "hfcvmutil -g". For details, refer to "Display General Information".

[Function] This command shows statistical information collected by devices or drivers. Statistical information includes data such as total count of I/Os after OS boot, I/O size distbirution, processing times to send/receive I/Os. This command displays statistical information for each port, but you can specify a core id number to display and can see statistical information of each core.

This command cannot be executed on a 4 Gbps FC-HBA or on an 8 Gbps FC-HBA. If you try to execute it, an error occurs. For details on the error indication, see the following example.

Example: execution on a 4 Gbps FC-HBA or an 8 Gbps FC-HBA

The following is an example of executing the total count indication on an 8 Gbps FC-HBA.

```
# ./hfcvmutil -pm vmhba5 count
Time:2013/11/21 05:00:05
Connecting...
Connect OK
------------------------------------------------------------
vmhba5 (hfcldd3)  WWPN: 50000870005b42e6  [LinkUp]
------------------------------------------------------------
Not applicable device.
#
```

[Syntax]

<Display I/O Total Counts>
    hfcvmutil [<target IP address> <username> <password> {yes|no}] -pm <vmhba>
    count [persec] [core] [vport { <vport number>|all}]

<Display I/O Size Distribution >
    hfcvmutil [<target IP address> <username> <password> {yes|no}] -pm <vmhba>
    io [persec] [core] [vport { <vport number>|all }]

<Display I/O Processing Time>
    hfcvmutil [<target IP address> <username> <password> {yes|no}] -pm <vmhba>
    latency [core] [vport { <vport number>|all }

<Reset Performance Counters>
    hfcvmutil [<target IP address> <username> <password> {yes|no}] -pm <vmhba>
    io clear

persec: Display statistical information in one second
core: Display statistical information for each core.
vport <vport no>:   Display statistical information for each virtual fibre channel port.
                           Check "Display General Information" for vport number to
                           specify. If you want to specify vport number, execute
                           commands as follows.

```
# ./hfcvmutil -pm vmhba5 count vport 1
Time:2013/10/19 00:25:33
Connecting...
Connect OK

───────────────────────────────────────────────────────
vmhba5 (hfcldd3)  WWPN: 50000870005b42e6  [LinkUp]
───────────────────────────────────────────────────────
vport    Entry
vport1   WRCnt        0
vport1   RDCnt        13364
         :
```

If you specified "vport all" as arguments to the command, it displays information of
"vport 0" and configured Virtual Fibre Channel Ports. Information of "vport 0"
corresponds to the information of physical fibre channel port.

[Example 1 of Display I/O Total Counts] Without specifying core

```
# ./hfcvmutil -pm vmhba5 count
Time:2013/10/19 00:25:33
Connecting...
Connect OK
------------------------------------------------------------
vmhba5 (hfcldd3)   WWPN: 50000870005b42e6  [LinkUp]
------------------------------------------------------------
Entry
WRCnt           0
RDCnt           13364
WR-Data         0
RD-Data         3607552
Int             13364
Cmnd/Int        1
Cmnd/IntAvg     1.00
BusyResp        0
HBABusy         0
TXQBusy         0
SGLBusy         0
DMABusy         0
IOEr            0
IoSyn           1
IoSig           5046
NOS             0
LinkEr          5047
CRCEr           0
```

[Example 2 of Display I/O Total Counts] With specifying core

```
# ./hfcvmutil -pm vmhba5 count core
Time:2013/10/19 00:27:15
Connecting...
Connect OK
---------------------------------------------------------------
vmhba5 (hfcldd3)  WWPN: 50000870005b42e6  [LinkUp]
---------------------------------------------------------------
Entry          core1              core3
WRCnt          0                  0
RDCnt          6682               7453
WR-Data        0                  0
RD-Data        1803776            2011904
Int            6682               7453
Cmnd/Int       1                  1
Cmnd/IntAvg    1.00               1.00
BusyResp       0                  0
HBABusy        0                  0
TXQBusy        0                  0
SGLBusy        0                  0
DMABusy        0                  0
IOEr           0                  0
IoSyn          -                  -
IoSig          -                  -
NOS            -                  -
LinkEr         -                  -
CRCEr          0                  0
```

[Field definitions]

Display entry	Description	
vmhba*	vmhba number	
hfcldd*/ hfcndd*	Logical device number	
	hfcldd*	Logical device number that vmklinux driver recognizes
	hfcndd*	Logical device number that native driver recognizes
WWPN	World Wide Port Name	
Status	Indicates the status of the port. Port status is shown below. LinkUp : Normal condition. LinkDown : FC cable is not plugged. WaitLinkUp : Waiting to Linkup after Linkdown is detected. Isolate(C) : Isolated by executing command. Isolate(SFPFail) : SFP failure is detected. Isolate(SFPNotSupport): Unsupported SFP is plugged. Isolate(SFPDown) : SFP is not plugged. Isolate(CHK-STP) : Adapter is check-stop state.	
CoreX	The core id number used to display the statistics.	
WRCnt	Write command count	
RDCnt	Read command count	
WR-Data	Write Data Transfer Count	
RD-Data	Read Data Transfer Count	
Int	Interrupt number	
Cmnd/Int	Maximum command number per one interruption	
Cmnd/IntArg	Average SCSI command number per one interruption	
BusyResp	Number of busy response to upper-layer drivers	
HBABusy	Frame_A Busy count	
TXQBusy	XOB Busy count	
SGLBusy	Seg_info Full count	
DMABusy	Excess count of Maximum Transfer Size	
IOEr	Error response count to upper-layer drivers	
loSyn	Loss of sync count	
loSig	Loss of signal count	
NOS	NOS Event count	
LinkEr	Link Fail count	
CRCEr	CRC Error count	

[Notes]

(1) The entries shown below does not have statistical information by each core. Therefore, if you specified a core number to hfcvmutil command, it does not display any value for those entries.

loSyn, loSig, NOS, LinkEr

[Example 1 of Display I/O Size Distribution] Without specifying core

```
# ./hfcvmutil -pm vmhba5 io
Time:2013/10/19 00:28:34
Connecting...
Connect OK
--------------------------------------------------------
vmhba5 (hfcldd3)  WWPN: 50000870005b42e6  [LinkUp]
--------------------------------------------------------
Entry
RD-512B       14080
RD-2KB        0
RD-4KB        55
RD-16KB       0
RD-32KB       0
RD-Over       0
WR-512B       0
WR-2KB        0
WR-4KB        0
WR-16KB       0
WR-32KB       0
WR-Over       0
```

[Example 2 of Display I/O Size Distribution] With specifying core

```
# ./hfcvmutil -pm vmhba5 io core
Time:2013/10/19 00:29:10
Connecting...
Connect OK
--------------------------------------------------------
vmhba5 (hfcldd3)  WWPN: 50000870005b42e6  [LinkUp]
--------------------------------------------------------
Entry         core1           core3
RD-512B       6656            7424
RD-2KB        0               0
RD-4KB        26              29
RD-16KB       0               0
RD-32KB       0               0
RD-Over       0               0
WR-512B       0               0
WR-2KB        0               0
WR-4KB        0               0
WR-16KB       0               0
WR-32KB       0               0
WR-Over       0               0
```

[Field definitions]

Display entry	Description	
vmhba*	vmhba number	
hfcldd*/ hfcndd*	Logical device number	
	hfcldd*	Logical device number that vmklinux driver recognizes
	hfcndd*	Logical device number that native driver recognizes
WWPN	World Wide Port Name	
Status	Indicates the status of the port. Port status is shown below. LinkUp : Normal condition. LinkDown : FC cable is not plugged. WaitLinkUp : Waiting to Linkup after Linkdown is detected. Isolate(C) : Isolated by executing command. Isolate(SFPFail) : SFP failure is detected. Isolate(SFPNotSupport): Unsupported SFP is plugged. Isolate(SFPDown) : SFP is not plugged. Isolate(CHK-STP) : Adapter is check-stop state.	
CoreX	The core id number used to display the statistics.	
RD-512B	The count of Read I/O that is smaller than or equal to 512byte	
RD-2KB	The count of Read I/O that is larger than 512byte and smaller than or equal to 2Kbyte	
RD-4KB	The count of Read I/O that is larger than 2Kbyte and smaller than or equal to 4Kbyte	
RD-16KB	The count of Read I/O that is larger than 4Kbyte and smaller than or equal to 16Kbyte	
RD-32KB	The count of Read I/O that is larger than 16Kbyte and smaller than or equal to 32Kbyte	
RD-Over	The count of Read I/O that is larger than 32Kbyte	
WR-512B	The count of Write I/O that is smaller than or equal to 512byte	
WR-2KB	The count of Write I/O that is larger than 512byte and smaller than or equal to 2Kbyte	
WR-4KB	The count of Write I/O that is larger than 2Kbyte and smaller than or equal to 4Kbyte	
WR-16KB	The count of Write I/O that is larger than 4Kbyte and smaller than or equal to 16Kbyte	
WR-32KB	The count of Write I/O that is larger than 16Kbyte and smaller than or equal to 32Kbyte	
WR-Over	The count of Write I/O that is larger than 32Kbyte	

[Example 1 of Display I/O Processing Time] Without specifying core

```
# ./hfcvmutil -pm vmhba5 latency
Time:2013/10/19 00:30:24
Connecting...
Connect OK
----------------------------------------------------------
vmhba5 (hfcldd3)  WWPN: 50000870005b42e6  [LinkUp]
----------------------------------------------------------
Entry
TXMax[usec]    7.99
TXMin[usec]    0.49
TXAvg[usec]    1.34
TXCnt          4096
RSPMax[usec]   311745.62
RSPMin[usec]   93.55
RSPAvg[usec]   7225.31
RSPCnt         932
RXMax[usec]    8.20
RXMin[usec]    0.65
RXAvg[usec]    2.16
RXCnt          3860
RD/IOPS        1788
WR/IOPS        3446
RDCnt          1390
WRCnt          2706
RD-Data        30216192
WR-Data        33501184
CPU Freq: 2926000000 Hz
RspMax RD-Cmd: OpeCode[0x28] I/O Size[159744]
RspMax WR-Cmd: OpeCode[0x2a] I/O Size[20480]
```

[Example 2 of Display I/O Processing] With specifying core

```
# ./hfcvmutil -pm vmhba5 latency core
Time:2013/11/21 05:00:05
Connecting...
Connect OK
----------------------------------------------------------
vmhba5 (hfcldd3)   WWPN: 50000870005b42e6   [LinkUp]
----------------------------------------------------------
Entry          core0              core2
TXMax[usec]    7.76               7.36
TXMin[usec]    1.37               1.19
TXAvg[usec]    2.76               2.57
TXCnt          104                104
RSPMax[usec]   384588.03          619871.17
RSPMin[usec]   69.00              62.86
RSPAvg[usec]   17219.94           23873.09
RSPCnt         66                 68
RXMax[usec]    16.79              7.90
RXMin[usec]    1.19               1.98
RXAvg[usec]    3.61               3.27
RXCnt          104                104
RD/IOPS        0                  0
WR/IOPS        0                  0
RDCnt          3992               104
WRCnt          0                  0
RD-Data        374000             369796
WR-Data        0                  0
CPU Freq: 2926000000 Hz
RspMax RD-Cmd: OpeCode[0x28] I/O Size[8192]
RspMax WR-Cmd: OpeCode[0x00] I/O Size[0]
```

To calculate I/O Processing Time, this command collects recently executed I/O commands up to 8192 commands, except for IOPS entry that may be count more than 8192 commands. The number of I/Os to count in this command may vary on the environment.

[Field definitions]

Display entry		Description	
vmhba*		vmhba number	
hfcldd*/ hfcndd*		Logical device number	
		hfcldd*	Logical device number that vmklinux driver recognizes
		hfcndd*	Logical device number that native driver recognizes
WWPN		World Wide Port Name	
Status		Indicates the status of the port. Port status is shown below. LinkUp : Normal condition. LinkDown : FC cable is not plugged. WaitLinkUp : Waiting to Linkup after Linkdown is detected. Isolate(C) : Isolated by executing command. Isolate(SFPFail) : SFP failure is detected. Isolate(SFPNotSupport) : Unsupported SFP is plugged. Isolate(SFPDown) : SFP is not plugged. Isolate(CHK-STP) : Adapter is check-stop state	
CoreX		The core id number used to display the statistics	
TXMax		Maximum Sending Time in the collected samples	
TXMin		Minimum Sending Time in the collected samples	
TXAvg		Average Sending Time in the collected samples	
TXCnt		The number of collected samples of sending	
RSPMax		Maximum Response Time in the collected samples	
RSPMin		Minimum Response Time in the collected samples	
RSPAvg		Average Response Time in the collected samples	
RSPCnt		The number of collected samples of response	
RXMax		Maximum Receiving Time in the collected samples	
RXMin		Minimum Receiving Time in the collected samples	
RXAvg		Average Receiving Time in the collected samples	
RXCnt		The number of collected samples of receiving	
RD/IOPS		Read IOPS	
WR/IOPS		Write IOPS	
RDCnt		Read Count	
WRCnt		Write Count	
RD-Data		Total Read Data Size	
WR-Data		Total Write Data Size	
CPU Freq		CPU Frequency *may vary on workload	
RSPMax RD-Cmd			
	OpeCode	OpeCode of the Read command that has maximum receiving time	
	I/O Size	I/O size of the Read command that has maximum receiving time	
RSPMax WR-Cmd			
	OpeCode	OpeCode of the Write command that has maximum receiving time	
	I/O Size	I/O size of the Write command that has maximum receiving time	

[Notes]

    (1) To display I/O Processing Time, Set "Additional Performance Monitor" feature of "Display or Set Port Parameters" beforehand.

(2) If you are using Virtual Fibre Channel, the size of statistic information may be large and sometimes you should wait for it to be displayed after seeing "Connect OK" message.

Display help information

[Function] Display help information

[Syntax]
hfcvmutil <target IP address> <username> <password> {yes|no}] -h

  [Example]

```
# ./hfcvmutil -h
--------------------------------------------------
 Please select the number you want to refer help.
--------------------------------------------------
 1  : Port Definition
 2  : General Information
 3  : Port Information
 4  : Boot Information
 5  : Firm Backup/Update Execution
 6  : Display Target Information
 7  : Firm Online Update Execution
 8  : Isolate Status Information
 9  : Isolate Port Information
 10 : Isolate Command Information
 11 : Initiate Target Scan
 12 : Bios Backup
 13 : Bios Restore

 14 : All Commands

Enter Number >2
-------------------------------------------------------
hfcvmutil [<target IP address> <username> <password> {yes|no}]
<commands> [<options>]
        ex. hfcvmutil -p <vmhbaXX>

common parameters
   <target IP address> : IP address of target host.

(omitted below)
```

> Displayed information
> may vary depending on
> the utility version.

List of return code of hfcvmutil

The following tables shows return codes and error messages of hfcvmutil.

Check the version combination of the utility and the driver are supported. If you use them in unsupported combination, hfcvmutil command does not work properly and appropriate message may not be displayed. Refer to HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Support Matrix Edition) for supported combinations.

#		Message	Description	Action
1			Format error of input parameters	
		Command syntax error.(command help -h option)	Command syntax error	Confirm the command syntax.
		Input data is not numeral.	Numerical data should be specified	Confirm the command syntax.
		Input data is out of range.	Data is out of available range	Confirm the input parameter
		Input data is invalid	Specified parameter value is invalid.	Confirm the input parameter
		Input vmhbaNo is illegal.	Specified vmhba number is invalid	Confirm whether vmhba number is appropriate.
		No such <vmhba>.	Specified vmhba number does not exist	Confirm whether vmhba number is appropriate.
		No such file.	Specified file does not exist.	Confirm whether the file exists.
		read input data failed	Failed to read input data	Retry command
		Read input file failed	Failed to read specified file	Confirm whether the file exists.
		File format illegal.	Contents of the specified file does not meet required file format	Confirm file contents.
		Input wwn is illegal	Specified wwn does not meet required format	Confirm the wwn to input
		Input WWN is not configured	Specified wwn does not exist on the system	Confirm the wwn to input
		No such <vport no>	Specified vport number is not used on the system	Confirm the vport no to input
		Input option is not support operation.(delete)	You cannot delete the parameter value	Confirm permitted arguments for the parameter
		Input option is not support operation.(all)	You cannot use "all" as an argument	Confirm permitted arguments for the parameter
		Input option is not support operation.(vmhbaX)	You cannot assign specific vmhba number as an argument	Confirm permitted arguments for the parameter

2	Invalid "CimHostInfoFileName":		Error related to configuration file (vmutil.conf)	
	Read Error		Failed to read configuration file	Confirm whether the configuration file exists.
	Null		Configuration file is empty	Confirm the contents of configuration file.
	Format Error		Format error of Configuration file	
		("num")	Need more parameters	Confirm the contents of configuration file.
		("CimHostInfoIpAddrTag")	Host name is invalid	Confirm the host name in configuration file.
		("CimHostInfoUserTag")	User name is invalid	Confirm the user name in configuration file.
		("CimHostInfoPwdTag")	Password is invalid	Confirm the password in configuration file.
		("CimHostInfoCertTag")	Server Cert field is invalid	Confirm whether cert field is properly specified

3	Connection Failed	Failed to connect host.	Confirm the followings and retry command. (*1)Target host is connected to the network (*2)IP address is appropriate.
	Upload File Failed	Failed to upload specified file to the host	Confirm the followings and retry command. (*1)IP address is appropriate. (*2) Server Cert field is 'no'
4	Disconnection Failed	Failed to disconnect ESXi.	Failed to disconnect but the termination procedure has already finished. No additional procedure is required
5	Operation Failed	Internal error	Confirm whether the target host is connected to the network. For details, please refer HfcVmUtilLoggingX.log.
6	No hfcldd port	No Hitachi Gigabit Fiber Channel Adapter port exisrs.	Confirm the followings and retry command. (*1)Target host is corrected. (*2) Hitachi Gigabit Fiber Channel Adapter is installed on the host
7	Access busy, please try again later.	This function can not handle multiple requests	Confirm whether multiple requests are not issued to the host simulteniously and retry command.
8	Driver param length is over	Too much parameter is set	Remove unnecessary parameters and retry command
9	No UpdateFile Failed.	The file specified by the command does not exist on the ESXi host.	Make sure the specified file exists on the ESXi host.

6

Driver parameters

You can set driver parameters below on VMware as well as on Linux. Refer to HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Utility Software Edition) for details.

❑ hfcvmutil that supports 16Gbps Fibre Channel Adapter

This section refers to the hfcvmutil that supports 16Gbps Fibre Channel Adapter (version 1.40.18-60a or later). For the other versions of hfcvmutil that do not support 16Gbps Fibre Channel Adapter, please refer to p109. You can check hfcvmutil version by executing a command, "hfcvmutil -g". For details, refer to "Display General Information" section. If you are seeing this manual online, you can jump to the descriptions of each option in the "Display General Information" section, by clicking its name in the table below. Refer to the descriptions to confirm available configurations.

[Detailed description]

Displayed entry (Specified parameter)
Description
Connection Type (-p ct)
Specify the connection type of a FC path between Hitachi Fibre Channel Adapter and the device attached to it. If you specified "Auto", this product negotiates with the device connected to it and automatically sets the connection type to "Arbitrated Loop" or "Point to Point" mode, depending on the situations. Usually, you do not need to change this parameter. <table><tr><td>Displayed value</td><td>Description</td></tr><tr><td>Point to Point[fabric]</td><td>Point to Point (FC-SW Connection)</td></tr><tr><td>Point to Point</td><td>Point to Point (Direct Connection)</td></tr><tr><td>FC-AL[fabric]</td><td>Fibre Channel Arbitrated Loop (FC-SW Connection)</td></tr><tr><td>FC-AL</td><td>Fibre Channel Arbitrated Loop (Direct Connection)</td></tr></table>
Multiple PortID (-p mpid)
Hitachi Fibre Channel Adapter can emulate FC-SW virtually. This function depends on the combination of Connection Type and this option value. For details, refer to HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (BIOS/EFI Edition). This parameter can be set only with 16G Fibre Channel Adapters.
Link Speed (-p sp)
Specify the link speed of a FC path between Hitachi Fibre Channel Adapter and the device attached to it. The relations between specified value and the Link Speed are as follows. <table><tr><td><Specified Parameter></td><td><Link Speed></td></tr><tr><td>1</td><td>1Gbps</td></tr><tr><td>2</td><td>2Gbps</td></tr><tr><td>4</td><td>4Gbps</td></tr><tr><td>8</td><td>8Gbps</td></tr><tr><td>16</td><td>16Gbps</td></tr></table> If you specified "auto", this product negotiates with the device connected to it and automatically sets the link speed to a suitable value, depending on the situations. Usually, you do not need to change this parameter.

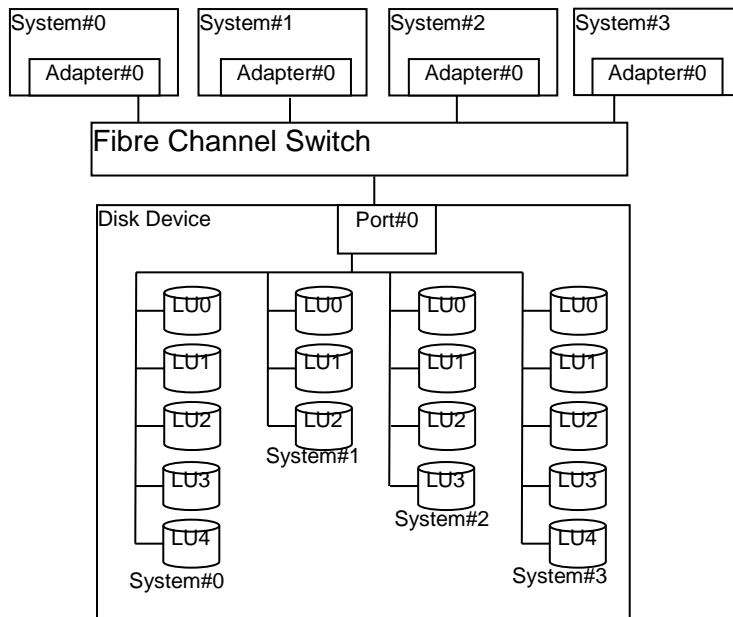| |
|---|
| Login Delay Time (-p lo) |
| In case it takes a long time to log into the target device, you can set a larger delay time to the adapter port by using this parameter. |
| Max Transfer Size (-p mt) |
| This parameter defines the maximum data length of a single request. The parameter is set to the optimum value for a general purpose, so usually you need not to change it.
Even if you increase the value exceeding a certain level, the performance usually remains the same level, although the memory used by the adapter is increased. |
| Link Down Time (-p ld) |
| Time out value in seconds for the next link up after the driver detected a link down. The parameter is set to the optimum value for a general purpose, so usually you need not to change it. |
| Reset Delay Time (-p rd) |
| This parameter specifies the time before processing the next SCSI command after a reset (Target Reset, etc.) command succeeded. The parameter is set to the optimum value for a general purpose, so usually you need not to change it. |
| Machine Check Retry Count (-p mc) *Displayed as "Machine Check" |
| This parameter specifies maximum permissive number of hardware failures before the adapter port become blocked. If you set 0 to this parameter, the driver does not block the adapter port by a hardware failure. The parameter is set to the optimum value for a general purpose, so usually you need not to change it. |
| Reset Timeout (-p rt) |
| This parameter specifies the time out value in seconds of a Target Reset command.
The parameter is set to the optimum value for a general purpose, so usually you need not to change it. |
| Abort Timeout (-p at) |
| This parameter specifies the time out value in seconds of an Abort Task Set command.
The parameter is set to the optimum value for a general purpose, so usually you need not to change it. |

Queue Depth (-p qd)

This parameter specifies maximum permissive I/O command number to queue per LU on the target device. Since each target device have a maximum permissive I/O command number, so check the specification of the target device.

(Example) If you are using 17 LUs on a target device and the device have a port that can queue maximum 512 commands per second, and 4 systems are using the device. See the figure below.

You can calculate the maximum number of the I/O available for queuing per LU with the following formula:

(Max. value of the I/O queuing number)÷(Number of LUs connected)

In this situation: 512 ÷ 17 = 30.11... Therefore, you need to set 30 or lower value to this parameter.

Interrupt Type (-p ir)

This parameter specifies interrupt mode. The parameter is set to the optimum value for a general purpose, so usually you need not to change it.

Refer to the table below for the descriptions of the displayed values.

Displayed value		Description
Legacy Mode	INT	Legacy interrupts
MSI Mode	MSI	Message Signaled Interrupts (MSI)
MSI-X Mode	MSI-X	Message Signaled Interrupts (MSI-X)

Logging Mode (-p lm)
If you are using FC-Switch and do not separate its ports into zones, for example, you are using Access Gateway mode of the FC-switch, the adapter ports access each other. Because of this reason, Link Down of the other adapter port or the server reboot may make the driver log unnecessary errors, such as the followings; 0x18 (RSCN is received) 0x0e (Login is failed) 0x16 (PLOGI is received) 0x17(LOGO is received) If you disabled this option, the driver does not log when accessing the other port. However, this option makes the driver not to collect any 0x0e (Login failed) log, for example, due to incorrect Zoning in FC-Switch or false LUN security setting. Please read Access Gateway mode in the manual of your FC-Switch. If you set "verbose" to this parameter on a 16G Adapters, the driver rejects not supported FC protocol frame or supported FC protocol frame with some errors and log errors as 0xDC. If you do not use 16G adapter, the driver recognizes this parameter as a default.

Login Target Filter (-p tf)
You need not to change it.

Login Target Filter (for 16G Fibre Channel Adapter) (-p tfx) *Displayed as "Login Target Filter 16G" or "Login Target Filter Ext"
This parameter value is set to 'pid' as a default. When FC-Switch is used, restrain unnecessary logging in to target ports from adapter ports. If this parameter value is set to pid, the driver does not log in to target ports that have the same upper 2 bytes in 3 bytes of the PORT ID of the Adapter itself. This option may be effective on the FC-Switch without zonings, for example, FC-Switches with Access Gateway mode enabled. When FC-Switch is used with Access Gateway mode, the boot time of the OS might be prolonged because unnecessary FC accesses arise between the FC ports that are not separated by zoning. If this option is set to 'pid', the driver can decrease unnecessary access. Please read Access Gateway mode in the manual of the FC-Switch. Notice: If this feature is enabled, refer to the following information. Depending on the FC-Switch, upper 2 bytes of a target port and a host port may correspond to each other unintentionally. In such circumstances, log in to the target may fail. In such situation, set this option to "none", or reconfigure upper 2 byte of the PORT IDs on the FC-Switch not to correspond to each other. Please refer to the "Login Target Filter Function" entry.

Login Target Filter Function		
*Displayed by version of CIM Client is 1.29.18-80a, 1.40.18-80a or 1.42.18-80d.		

When the value is "on", it restrains login to the target ports that have the same upper 2 bytes in 3 bytes of the PORT ID of the Adapter itself. When the value is "off", it does not restrain. For set "on" or "off", it is necessary to change setting of "Login Target filter" and "Login Target Filter Ext". About the setting, refer to the following.

4G or 8G Fibre Channel Adapters

Setting Login Target Filter	Setting Login Target Filter Ext	Login Target Filter Function
none	pid	on
none	none	off

16G Fibre Channel Adapters

Setting Login Target Filter Ext	Login Target Filter Function
pid	on
none	off

Depending on the FC-Switch, upper 2 bytes of a target port and a host port may correspond to each other unintentionally. In such circumstances, log in to the target may fail. In such situation, set this option to "none", or reconfigure upper 2 byte of the PORT IDs on the FC-Switch not to correspond to each other.

If you set value to "off", refer to this link.

Max Vport number for NPIV (-p vp)

This parameter specifies the maximum available number of virtual ports. The parameter is set to the optimum value for a general purpose, so usually you need not to change it.

This parameter can be set only with 16G Fibre Channel Adapters.

MCK Link Down Time (-p ldm)

Time out value in seconds for the next link up after the driver recovered from a hardware error (MCK). The parameter is set to the optimum value for a general purpose, so usually you need not to change it.

This parameter can be set only with 16G Fibre Channel Adapters.

Link Reset Mode (-p lr)
If the driver failed to execute an Abort Task Set command of some reason, such as a timeout, it escalates the error recovery layer to the entire target. If the driver also failed to reset the target, it executes a brief link down of the FC link between HBA and the I/O device, or between the HBA and a FC-Switch, as the last resort. This option can set an I/O handling policy from below for the reset with brief link down. (a) The driver makes the HBA port offline immediately and returns all I/Os received after the reset as I/O Error. (b) The driver keeps the HBA port online, and if the OS retried to issue once failed commands to the driver, the driver keeps the retried I/Os and waits for a link up to execute them on the linked up path. If you set this parameter as "multi", then the driver works with policy (a), and if the parameter is set to "single", the driver works with policy (b). This parameter can be set only with 16G Fibre Channel Adapters.

Link Init negotiation Timer (-p lit)
This parameter specifies the time out value in seconds to wait for a link negotiation when the server reboot. This parameter can be set only with 16G Fibre Channel Adapters.

Target Restrain (-p trs)
This parameter specifies inhibiting to issue reset commands for entire targets. The parameter is set to the optimum value for a general purpose, so usually you need not to change it. This parameter can be set only with 16G Fibre Channel Adapters.

Core Control (-p cc)
16G Fibre Channel Adapters with 1port or 2port have multiple cores per port. The driver can distribute I/O loads on multiple cores by the following policies.

Displayed value	Description
minq	Count command numbers on each core's response waiting queue and choose the least core to issue a new command.
iosize	Use previously chosen core if the command size exceeds the user-specified size. If the driver received a command smaller than the user-specified size and the previously chosen core is processing other command exceeding the user-specified size, the driver chooses a core other than the previously chosen core.

This parameter can be set only with 16G Fibre Channel Adapters. |

Core Control I/O Size (-p cc-size)
This parameter specifies the user-defined I/O size used by the "iosize" policy in the "Core Control" parameter. This parameter can be set only with 16G Fibre Channel Adapters.

Interrupt Coalescing (-p ic)
This adapter supports I/O coalescing feature to improve I/O performance. The feature suppresses the I/O completing interruption and each interruption occurs with a certain number of I/O completion requests. Therefore, the driver can process multiple I/O commands by one I/O completing interruption and can suppress interruption frequency in the system. You can specify the interval of I/O completing interruption to this parameter. This parameter can be set only with 16G Fibre Channel Adapters. <Notice: when you are using logical device name> If you specified a logical device name for an argument, all Fibre Channel Ports on the Adapter that contains the logical device have the specified value.

<u>Exchange per Core</u> (-p ioex)
This parameter specifies the amount of resource used by the Firmware on the Adapter. There are some cases when you set smaller value to this parameter and can get better performance. This parameter can be set only with 16G Fibre Channel Adapters.
<u>Additional Performance Monitor</u> (-p pm)
Start or Stop gathering statistical informations to display I/O Processing Time of the Performance Monitor feature. If you displayed I/O Processing Time with this parameter off, then you cannot get valid informations. This parameter can be set only with 16G Fibre Channel Adapters.
<u>Multi queue</u> (-p mque)
This parameter specifies effectiveness of the multi-queue feature of ESXi 6.x. The feature is enabled only if the Interrupt Type of the Adapter Port is set to MSI-X mode. If the Adapter Port is using another Interrupt Type, then this parameter value is displayed as "not work". This parameter can be set only with 16G Fibre Channel Adapters.

(1) If you changed the parameter values using the utility software, you should activate the new parameter value to the Adapter. The procedures are different depending on the changed parameters.
    If you changed the parameters that need rebooting to activate the newly configured parameter values, then you should reboot the OS. Otherwise, the newly configured parameter values are reflected to the working driver immediately, so you do not need to reboot the OS. For details, refer to the "Reboot required" column in the Option List Table in the section "Display or Set Port Parameters".

(2) If both types of parameters, general to all ports and port-specific one, are stored in the /etc/vmware/esx.conf in the ESXi host, the driver uses port-specific parameter value.
    As for the parameters stored in FLASH-ROM, the values finally stored in the FLASH-ROM is used.

(3) When you change the parameters stored in FLASH-ROM, do not close the working window, terminate the command forcibly, turn the power off or reboot the system.
    Such operations might damage FLASH-ROM and may lead a malfunction of the Hitachi Gigabit Fibre Channel Adapter.

(4) Notes on setting interrupt type.
    Depending on the system configuration, the driver may fails to activate the specified MSI-X interrupt type and reports Error Number 0xB0 to the OS log.
    If you changed Interrupt Type, then after updating RAMDISK image and rebooting the system, be sure to check the activated parameter value. 2Gbps and 4Gbps Fibre Channel Adapters cannot work with MSI or MSI-X interrupt type. If you use both 4Gbs Fibre Channel Adapter and 8Gbps Fibre Channel Adapter on a system and specify MSI-X interrupt type for all adapters, the error code 0xB0 is reported for the 4Gbps Fibre Channel Adapter since MSI-X interrupt type is not supported on the 4Gbps Adapter.

(5) Supported parameters and its range are different depending on the type of Hitachi Gigabit Fibre channel Adapter. Refer to the following table below. Please refer to HITACHI Gigabit Fibre Channel Adapter USER'S GUIDE (Support Matrix Edition) for Correspondence between Hitachi Gigabit Fibre Channel Adapter's model name and its product ID. For example, a model name "HFCE0801" corresponds to the id "GV-CC2D8G1N1**".

#	Adapter Type	Model Name	Parameter and its range		
			Link Speed (sp)	Max Transfer Size (mt)	Interrupt Type (ir)
1	2Gbps FC-HBA	HFC0201	Auto, 1, 2	1MB/4MB/8MB /16MB	int
2	4Gbps FC-HBA	HFC0401 HFC0402 HFC0401-C HFC0402-C HFC0402-M HFC0402-E	Auto, 1,2,4	1MB/4MB/8MB /16MB	int
3	8Gbps FC-HBA	HFCE0801 HFCE0802 HFCE0802-M HFCE0804-M	Auto, 2,4,8	1MB/4MB/8MB /16MB/32MB	int/msi/msix
4	16Gbps FC-HBA	HFCE1601 HFCE1602 HFCE1602-M HFCE1604-M	Auto, 4,8,16	1MB/4MB/8MB /16MB/32MB	Int/msi/msix

❑ hfcvmutil that does not support 16Gbps Fibre Channel Adapter

This section refers to the hfcvmutil that does not support 16Gbps Fibre Channel Adapter (version earlier than 1.40.18-60a). For the other versions of hfcvmutil that supports 16Gbps Fibre Channel Adapter, please refer to p101.
You can check hfcvmutil version by executing a command, "hfcvmutil -g".
For details, refer to "Display General Information".

[Detailed description]

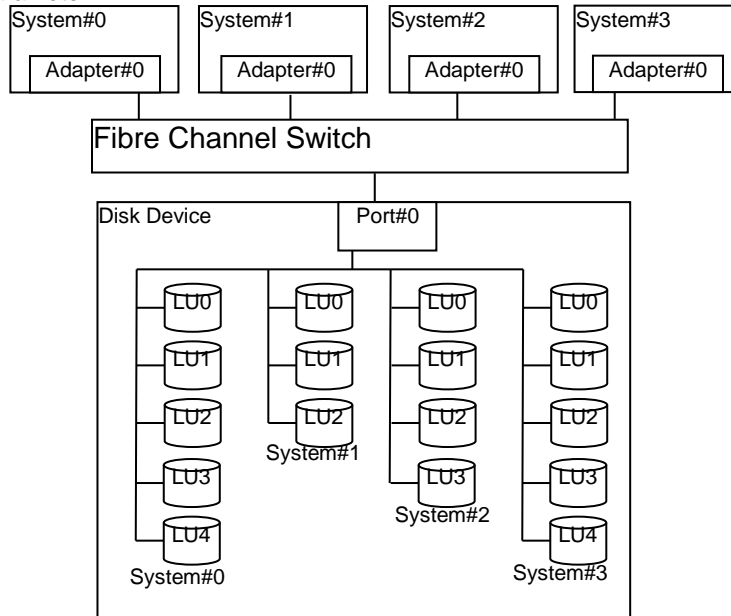| Displayed entry (Specified parameter) |
| :--- |
| Description |
| Max Transfer Size (-p mt) |
| This parameter defines the maximum data length of a single request. The parameter is set to the optimum value for a general purpose, so usually you need not to change it. Even if you increase the value exceeding a certain level, the performance usually remains the same level, although the memory used by the adapter is increased. |
| Link Down Time (-p ld) |
| Time out value in seconds for the next link up after the driver detected a link down. The parameter is set to the optimum value for a general purpose, so usually you need not to change it. |
| Reset Delay Time (-p rd) |
| This parameter specifies the time before processing the next SCSI command after a reset (Target Reset, etc.) command succeeded. The parameter is set to the optimum value for a general purpose, so usually you need not to change it. |
| Machine Check Retry Count (-p mc) *Displayed as "Machine Check" |
| This parameter specifies maximum permissive number of hardware failures before the adapter port become blocked. If you set 0 to this parameter, the driver does not block the adapter port by a hardware failure. The parameter is set to the optimum value for a general purpose, so usually you need not to change it. |
| Reset Timeout (-p rt) |
| This parameter specifies the time out value in seconds of a Target Reset command. The parameter is set to the optimum value for a general purpose, so usually you need not to change it. |
| Abort Timeout (-p at) |
| This parameter specifies the time out value in seconds of an Abort Task Set command. The parameter is set to the optimum value for a general purpose, so usually you need not to change it. |

Queue Depth (-p qd)

This parameter specifies maximum permissive I/O command number to queue per LU on the target device. Since each target device have a maximum permissive I/O command number, so check the specification of the target device.

(Example) If you are using 17 LUs on a target device and the device have a port that can queue maximum 512 commands per second, and 4 systems are using the device. See the figure below.

You can calculate the maximum number of the I/O available for queuing per LU with the following formula:

(Max. value of the I/O queuing number)÷(Number of LUs connected)

In this situation: $512 \div 17 = 30.11...$ Therefore, you need to set 30 or lower value to this parameter.

Interrupt Type (-p ir)

This parameter specifies interrupt mode. The parameter is set to the optimum value for a general purpose, so usually you need not to change it. Refer to the table below for the descriptions of the displayed values.

Displayed value		Description
Legacy Mode	INT	Legacy interrupts
MSI Mode	MSI	Message Signaled Interrupts (MSI)
MSI-X Mode	MSI-X	Message Signaled Interrupts (MSI-X)

Logging Mode (-p lm)

If you are using FC-Switch and do not separate its ports into zones, for example, you are using Access Gateway mode of the FC-switch, the adapter ports access each other. Because of this reason, Link Down of the other adapter port or the server reboot may make the driver log unnecessary errors, such as the followings;

0x18 (RSCN is received)
0x0e (Login is failed)
0x16 (PLOGI is received)
0x17(LOGO is received

If you disabled this option, the driver does not log when accessing the other port. However, this option makes the driver not to collect any 0x0e (Login failed) log, for example, due to incorrect Zoning in FC-Switch or false LUN security setting. Please read Access Gateway mode in the manual of your FC-Switch.

Login Target Filter (-p tf)
When you use FC-Switch with Access Gateway mode, the boot time of the OS might be prolonged because unnecessary FC accesses arise between the FC ports that are not separated by zoning. When you set 'Login Target Filter' 'pid', the driver can decrease unnecessary access.   Please read Access Gateway mode in the manual of your FC-Switch.

[Notes]
(1) You need to reboot after you configured or deleted parameter values. If you want to check the specified parameter value or the activated parameter value, refer to the section "Display or Set Port Parameters" for details.
(2) Notes on setting interrupt type.
Depending on the system configuration, the driver may fails to activate the specified MSI-X interrupt type and reports Error Number 0xB0 to the OS log.
If you changed Interrupt Type, then after updating RAMDISK image and rebooting the system, be sure to check the activated parameter value. 2Gbps and 4Gbps Fibre Channel Adapters cannot work with MSI or MSI-X interrupt type. If you use both 4Gbs Fibre Channel Adapter and 8Gbps Fibre Channel Adapter on a system and specify MSI-X interrupt type for all adapters, the error code 0xB0 is reported for the 4Gbps Fibre Channel Adapter since MSI-X interrupt type is not supported on the 4Gbps Adapter.
(3) Supported parameters and its range are different depending on the type of Hitachi Gigabit Fibre channel Adapter. Refer to the following table below. Please refer to HITACHI Gigabit Fibre Channel User's Guide (Support Matrix Edition) for Correspondence between Hitachi Gigabit Adapter's model name and its product ID. For example, a model name "HFCE0801" corresponds to the id "GV-CC2D8G1N1**".

#	Adapter Type	Model Name	Parameter and its range		
			Link Speed (sp)	Max Transfer Size (mt)	Interrupt Type (ir)
1	2Gbps FC-HBA	HFC0201	Auto, 1, 2	1MB/4MB/8MB/16MB	int
2	4Gbps FC-HBA	HFC0401 HFC0402 HFC0401-C HFC0402-C HFC0402-M HFC0402-E	Auto, 1,2,4	1MB/4MB/8MB/16MB	int
3	8Gbps FC-HBA	HFCE0801 HFCE0802 HFCE0802-M HFCE0804-M	Auto, 2,4,8	1MB/4MB/8MB/16MB/32MB	int/msi/msix

7

Appendix

Installing CIM utilities on Windows

CIM Provider

Install vSphere SDK for Perl on Windows and execute same procedures on vMA.
You can also install CIM provider directly on ESXi shell on the target host.

CIM Client

The following table shows recommended directory to install CIM client.

platform	Recommended install directory	Remarks
Windows Server 2003/2008/2003 R2/2008R2/ 2012/2012R2/20 16 x86/ x64	For x86 platform \Program Files\Hitachi\drivers\hba\hfcvm in the system disk. For x64 platform \Program Files(x86)\Hitachi\drivers\hba\hfcvm in the system disk.	
Windows XP Windows 7 Windows 8	The directory except 'Program Files' on the system disk. For the security reason, Windows OS does not allow write permission to the folder under the 'Program files' directory. Hitachi CIM Client program cannot run because it creates log files in the installed directory. Install CIM client except under the 'Program Files'.	

Execute the following procedure to install CIM client.

(1) Log on to Windows as Administrator.

(2) Create installed directory, for example '\Program Files (x86)\Hitachi\drivers\hba\hfcvm' on the system disk.

> C:\> mkdir "C:\Program Files (x86)\Hitachi\drivers\hba\hfcvm"

(3) Copy CIM client package to the install directory and unzip the file.
Depending on your unzip software, files may be unzipped to 'C:\Program Files
(x86)\Hitachi\drivers\hba\hfcvm\xxx' (xxx = CIM client package file name).
In this case, move all files and directories from 'C:\Program Files
(x86)\Hitachi\drivers\hba\hfcvm\xxx' to 'C:\Program Files
(x86)\Hitachi\drivers\hba\hfcvm'.

(4) Copy 'vmware.keystore' to 'C:\Program Files (x86)\Hitachi\drivers\hba\hfcvm\VMware-
Certs'.

> C:\Program Files (x86)\Hitachi\drivers\hba\hfcvm> dir VMware-Certs

> vmware.keystore

(5) Confirm the install path of JRE and modify the path if you need.

```
@echo off

set SAMPLEDIR=.

setlocal

:SETENV
set HFCJAVA=C:\Program Files (x86)\Java\jre6
set HFCHOME=.
set HFCAXIS=%HFCHOME%\axis-1_4
set HFCWBEM=%HFCHOME%\sblim-cim-client2-2.1.7-bin
set HFCVMKEYSTORE=%HFCHOME%\VMware-Certs\vmware.keystore
set HFCVMSTUB=%HFCHOME%\VMware
```

(6) Copy Java libraries contained in vSphere Web Service SDK package.

(For CIM client version 1.28.16-20b or 1.28.16-30a)

[Example]

The following example, vSphere Web Service SDK package, 'VMware-vSphere-
WS-SDK-5.0.0-373195.zip' is unzipped on the system directory (C:\).

```
VMware-vSphere-WS-SDK-5.0.0-373195
 + SDK
  + vsphere-ws
   + java
    + Axis
     + lib
      ┊ + activation.jar
      ┊ + mailapi.jar
```

```
Copy whole 'lib' directory to

'c:\Program
Files(x86)\Hitachi\drivers\hba\hfcvm\VMware'


C:\> mkdir "c:\Program Files
(x86)\Hitachi\drivers\hba\hfcvm\VMware\lib"

C:\> copy "c:\VMware-vSphere-WS-SDK-5.0.0-373195\SDK\
vsphere-ws\java\Axis\lib" "c:\Program Files
(x86)\Hitachi\drivers\hba\hfcvm\VMware\lib"
C:\> dir "c:\Program Files
(x86)\Hitachi\drivers\hba\hfcvm\VMware\lib"
   activation.har
   mailapi.jar
```

(7) Execute Batch file and confirm whether CIM client works properly.

C:\Program Files (x86)\Hitachi\drivers\hba\hfcvm> hfcvmutil 192.168.2.139 root password no -g

Error Log Information

CIM Provider supplies the function to gather the error log information for identification of the cause of the error.
The output destination of log information is /var/log/syslog.log on ESXi 5.5 or later.

Error Log Information

The error log is output in either two kinds of following form by syslog.log.

[ID]

2013-08-28T 19:35:36Z sfcb-hitachi[35568] :ff9cfb70|830f|RestoreFilePath:6:0
(Date)   (thread ID) (error ID)+(trace ID) (message)

[Tag]

2013-08-28T 19:35:36Z sfcb-hitachi[35568] :hfcmcup:Input data error.(WWN is wrong)
 (Date)   (tag)   (message)

Error Message

I show output error log information on the following tables. It consists of ID or Tag, Message, Description and Action to be taken.

[ID]

ErrorID	TraceID	Message	Description	Actions to be taken
00	36	xx flashrom in use	FlashROM in use.	*1
01	36	xx driver param in use	Config file in use.	*1
03	36	inquiry_buf alloc	Failed to allocate memory.	*1
04	36	reportluns_buf alloc	Failed to allocate memory.	*1
05	36	sense_buf alloc	Failed to allocate memory.	*1
08	36	Failed to get IP address	Failed to get IP address.	*3
0b	36	Failed to get build info	Failed to get build information.	*3
20	36	reportlunerr:xx	Ioctl error.	*3
21	00-34	xx thread num over	The number of threads is beyond maximum.	*1
21	36	reportluns buf	Failed to allocate memory.	*1
22	36	reportlunerr:xx	Ioctl error.	*3
30	12,13	alloc error	Failed to allocate memory.	*1
32	0f,11	xx	Failed to open device.	*3
32	00-07	xx:errno=xx	Failed to open device.	*3
33	00-0d, 10	xx	Failed to get port information.	*3
33	08,09	alloc error	Failed to allocate memory.	*1
33	0b	xx	Failed to get driver information.	*3

34	08	xx	Failed to get port information.	*3
34	09	ioctlerr:xx	Ioctl error.	*3
34	0b	xx	Failed to get firmware information.	*3
35	09	inquiryerr:xx	Ioctl error.	*3
35	09	inqerr:xx	Ioctl error.	*3
37	08	ioctlerr:xx	Ioctl error.	*3
38	08	inquiryerr:xx	Ioctl error.	*3
38	08	inqerr:xx	Ioctl error.	*3
3b	09	rptlunerr:xx	Ioctl error.	*3
3e	08	rptlunerr:xx	Ioctl error.	*3
41	00-34	xx thread num over	The number of threads is beyond maximum.	*1
4b	22	xx	Failed to add target to list.	*1
52	0f,11	xx	Failed to open device.	*3
52	00-07	xx:errno=xx	Failed to open device.	*3
53	00-0d, 10	xx	Failed to get port information.	*3
53	08,09	alloc error	Failed to allocate memory.	*1
54	08	xx	Failed to get port information.	*3
54	09	ioctlerr:xx	Ioctl error.	*3
54	0b	xx	Failed to get port information.	*3
55	09	inquiryerr:xx	Ioctl error.	*3
56	08	ioctlerr:xx	Ioctl error.	*3
56	0b	xx	Failed to get port information.	*3
57	08	inquiryerr:xx	Ioctl error.	*3
57	08	inqerr:xx	Ioctl error.	*3
5a	09	rptlunerr:xx	Ioctl error.	*3
5b	08	rptlunerr:xx	Ioctl error.	*3
5b	09	inqerr:xx	Ioctl error.	*3
61	00-34	xx thread num over	The number of threads is beyond maximum.	*1
63	12-34	xx:hfc_port_num=0	The requested object could not be found.	*2
64	00-07, 0f,11	xx:hfc_port_num=0	The requested object could not be found.	*2
71	12-34	xx thread num over	The number of threads is beyond maximum.	*1
81	0f, 11-34	xx thread num over	The number of threads is beyond maximum.	*1
82	0f	DeviceName:xx	Invalid parameter.	*2
83	0f	RestoreFilePath:xx	Invalid parameter.	*2
85	0f,11	xx:hfc_port_num=0	The requested object could not be found.	*2
85	0f	param:xx	Invalid parameter.	*2
86	0f	xx	Failed to invoke Method.	*1
86	11	xx	FlashROM in use.	*1
87	11	xx	Failed to invoke Method.	*1
89	0f	xx	FlashROM in use.	*1
8e	11	UpdateFilePath:xx	Invalid parameter.	*2
8f	11	DeviceName:xx	Invalid parameter.	*2
91	12-34	xx thread num over	The number of threads is beyond maximum.	*1
93	0b,0f	Failed to create in param	Failed to allocate memory.	*1
94	0b,0f	Failed to create out param	Failed to allocate memory.	*1
94	11	alloc error	Failed to allocate memory.	*1
94	12-34	xx:hfc_port_num=0	The requested object could not be found.	*2

95	0b,0f	Failed to get param xx	Failed to get driver information.	*3
95	11	deviceName:xx	Invalid parameter.	*2
96	0b,0f	Failed to get param xx	Failed to get driver information.	*3
96	11	alloc error	Failed to allocate memory.	*1
96	11	openerr:xx	Failed to open device.	*3
97-99	11	ioctlerr:xx	Ioctl error.	*3
9a	11	alloc error	Failed to allocate memory.	*1
9d	0b,11	xx:Failed to get OtherParam	Failed to allocate memory.	*1
9e,9f	0b	alloc error	Failed to allocate memory.	*1
e0,e1	02,10	alloc error	Failed to allocate memory.	*1
e1	09	capacityerr:xx	Ioctl error.	*3
e1	09	caperr:xx	Ioctl error.	*3
e1	0b	ioctlerr:xx	Ioctl error.	*3
e2	02,0b	ioctlerr:xx	Ioctl error.	*3
e2	09,10	alloc error	Failed to allocate memory.	*1
e3	02	ioctlerr:xx	Ioctl error.	*3
e3,e4	09,10	alloc error	Failed to allocate memory.	*1
e5,e6	02,10	alloc error	Failed to allocate memory.	*1
e7-ea	02	alloc error	Failed to allocate memory.	*1
eb	02,08	ioctlerr:xx	ioctl error	*3
ec	02	ioctlerr:xx	ioctl error	*3
ed-ef	08	alloc error	Failed to allocate memory.	*1
f0	0f	param:xx	Invalid parameter.	*2
f0	0f	DeviceNo:xx	Invalid parameter	*2
f1	0f	xx:Failed to get Param num	Invalid parameter.	*2
f1	12-34	xx thread num over	The number of threads is beyond maximum.	*1
f2	05,07,0b	openerr:xx	Failed to open device.	*3
f2	0f	param:xx	Invalid parameter.	*2
f3	01,04	openerr:xx	Failed to open device.	*3
f3	02,0b	alloc error	Failed to allocate memory.	*1
f3	0f	param:xx	Invalid parameter.	*2
f4	0b	alloc error	Failed to allocate memory.	*1
f4	0f	param:xx	Invalid parameter.	*2
f4	0f	set driver param string	Failed to allocate memory.	*1
f4	12-34	xx:hfc_port_num=0	The requested object could not be found.	*2
f5	00,02,03 08,09	openerr:xx	Failed to open device.	*3
f5	0f	param:xx	Invalid parameter.	*2
f6	09	ioctlerr:xx	Ioctl error.	*3
f7	08	ioctlerr:xx	Ioctl error.	*3
f7	09	inquiryerr:xx	Ioctl error.	*3
f7	09	inqerr:xx	Ioctl error.	*3
f8	08	inquiryerr:xx	Ioctl error.	*3
f8	08	inqerr:xx	Ioctl error.	*3
f8	0f	fw no spt:xx	This Firmware version does not support isolation.	*3
f9	0f	alloc error	Failed to allocate memory.	*1
f9	0f	ioctlerr:xx	Ioctl error.	*3
fa	08,09	rptlunerr:xx	Ioctl error.	*3
fa	0f	ioctlerr2:xx	Ioctl error.	*3
fa	0f	already isolate:xx	Already in check-stop status.	*3

fa	0f	SFP in trouble status:xx	Invalid SFP status	*3
fb	0a	alloc error	Failed to allocate memory.	*1
fb	0f	openerr:xx	Failed to open device.	*3
fb	0f	ioctlerr:xx	Ioctl error.	*3
fb	0f	ioctlerr1:xx	Ioctl error.	*3
fc	0a	alloc error	Failed to allocate memory.	*1
fc	0f	TargetScan all (xx) is invalid	Invalid parameter.	*2
fc	0f	SetLM xx is invalid	Invalid parameter.	*2
fc	0f	already chkstop:xx	Already in check-stop status.	*3
fc	0f	size over driver param	The total length of the driver parameter setting exceeds the maximum value.	*11
fd	03,0f	ioctlerr:xx	Ioctl error.	*3
fd	0a,0f	alloc error	Failed to allocate memory.	*1
fd	0f	TargetScan hfclddxx is invalid	Invalid parameter.	*2
fd	0f	SetLM Val:xx	Invalid parameter.	*2
fd	0f	size over driver param	The total length of the driver parameter setting exceeds the maximum value.	*11
fd	0f	xx:errcode	ioctl error	*3
fe	0a,0c,0d	alloc error	Failed to allocate memory.	*3
fe	0f	ioctlerr:xx	Ioctl error.	*3
fe	0f	TargetScan All:xx	Failed to open device.	*3
fe	0f	SetLM Opr:xx	Invalid parameter.	*2
fe	0f	openerr:xx	Failed to open device.	*3
fe	0f	size over driver param	The total length of the driver parameter setting exceeds the maximum value.	*11
ff	03,05	ioctlerr:xx	Ioctl error.	*3
ff	0c,0d	alloc error	Failed to allocate memory.	*1
ff	0f	openerr:xx	Failed to open device.	*3
ff	0f	TargetScan DeviceNo:xx	Invalid parameter.	*2
ff	0f	SetLM Mode:xx	Invalid parameter.	*2
ff	0f	DeviceNo:xx	Invalid parameter.	*2
ff	0f	CoreNo:xx	Invalid parameter.	*2
ff	0f	TraceMode:xx	Invalid parameter.	*2
ff	0f	vportNo:xx	Invalid parameter.	*2

*1) Wait for a while and retry.
*2) Check the parameter value.
*3) Check the status of HBA port.
*4) Check the disk size and re-execute.
*5) Please update firmware again before shutting down a host.
*6) Delete unnecessary file from /tmp of the host.
*7) Check the appointed file.
*8) It is necessary to reboot host for update firmware.
*9) Please contact maintenance personnel or support service.
*10) It is not necessary to do anything.
*11) If you see this message, delete not-needed parameter configuration or delete configurations of not used ports. For details, refer to the section "Display or Set Port Parameters" or "Update or Delete port-specific configuration".

[Tag]

Tag	Message	Description	Actions to be taken
hfcbios	Open error.(xxx)	Failed to open device.	*3
hfcbios	ioctl error.(xxx)	Ioctl error.	*3
hfcbios	other port(s) busy.(xxx)	Device busy.	*1
hfcbios	file open error!!(filename = xx)	Failed to open file.	*7
hfcbios	file write error!!(filename = xx)	Failed to write file.	*7
hfcbios	Input data error.(xx)	File size is wrong.	*7
hfcbios	It is different from the package of the backup.	It is different from the package of the backup.	*7
hfcbios	Flash write error.(xx)	Failed to write FlashROM.	*9
hfcbios	Flash erase error.(xx)	Failed to erase FlashROM.	*9
hfcbios	unknown device_id(xx)	No such device.	*3
hfcbios	"-- CAUTION!FLASH MEMORY IS ALREADY INVALID.."	You must rewrite FlashROM.	*5
hfcbios	calloc ng	Failed to allocate memory	*1
hfcmcref	Parameter error.	Invalid parameter.	*2
hfcmcref	Another F/W update process is running.	FlashROM in use.	*1
hfcmcref	xxx : ioctl(xxx) error.(xxx)	Ioctl error.	*3
hfcmcref	xxx : flash read error.(xxx)	Failed to read FlashROM.	*9
hfcmcref	Adapter status error.	Adapter is not status to be able to online update.	*3
hfcmcref	Already update.	FlashROM is the same as a current firmware version.	*10
hfcmcref	Update process reserved.	Update process reserved.	*10
hfcmcref	Unsupport F/W error.	Online update is unsupported.	*8
hfcmcref	Inapplicable - FW error.	Online update is unsupported	*8
hfcmcref	Inapplicable - HW error.	Online update is unsupported.	*8
hfcmcref	xx is unsupport.	Online update is unsupported.	*8
hfcmcref	xx is unsupport for FPP.	Online update is unsupported.	*8
hfcmcref	Adapter busy error. try again later.	Device busy.	*1
hfcmcref	other port(s) busy.(xxx)	Device busy.	*1
hfcmcref	calloc error.(xx)	Failed to allocate memory.	*1
hfcmcref	Update file size error.(xx)	Size of update file is wrong.	*7
hfcmcref	Update file open error.(xx)	Failed to open update file.	*7
hfcmcref	Update file read error.(xx)	Failed to read update file.	*7
hfcmcref	Update file access error.(xx)	Failed to access update file.	*7
hfcmcref	Conflict was detected. offset:xx, read byte:xx	FlashROM in use.	*11
hfcmcref	Please execute it again after waiting for the end of other HBA tools.	Other HBA tools are running.	*1
hfcmcref	Open error.(xx)	Failed to open device.	*3
hfcmcref	unknown device_id(xx)	No such device.	*3
hfcmcup	another F/W update process is running	FlashROM in use.	*1
hfcmcup	memory allocate error	Failed to allocate memory.	*1
hfcmcup	Input file open error(xx)	Failed to open update file.	*7
hfcmcup	Input file read error(xx)	Failed to read update file.	*7
hfcmcup	Input data error.(xx)	Update file is illegal.	*7
hfcmcup	Update file is illegal.	Update file is illegal.	*7
hfcmcup	Unsupported package code.	This package is unsupported.	*7
hfcmcup	Unsupported device id.	This device is unsupported.	*7
hfcmcup	cannot get a data from file	Failed to read file.	*7

hfcmcup	parity error.(xx)	Failed to access FlashROM	*9
hfcmcup	Open error.(xxx)	Failed to open device.	*3
hfcmcup	Opendir error(errno=xx)	Failed to open device.	*3
hfcmcup	Flash read error.(xx)	Failed to read FlashROM.	*9
hfcmcup	Flash write error.(xx)	Failed to write FlashROM.	*9
hfcmcup	Flash erase error.(xx)	Failed to erase FlashROM.	*9
hfcmcup	too many input file. The number of the maximums is 256	Too many relative files in the directory	*6
hfcmcup	backup file create error(file name xx)	Failed to create backup file.	*4
hfcmcup	backup file write error(file name xx)	Failed to write backup file.	*4
hfcmcup	fail sector(xx) protect after fail to erase	Failed to protect a sector of FLASH-ROM.	*9
hfcmcup	fail sector(xx) protect after fail to write	Failed to protect a sector of FLASH-ROM.	*9
hfcmcup	OnlineUpdate is reserving it.	OnlineUpdate is reserving it.	*10
hfcmcup	ioctl error.(xxx)	Ioctl error.	*3
hfcmcup	other port(s) busy.(xxx)	Device busy.	*1
hfcmcup	Adapter status busy. please try again later.	Device busy.	*1
hfcmcup	time over sector protect	Failed to protect a sector of FLASH-ROM.	*9
hfcmcup	-- CAUTION!FLASH MEMORY IS ALREADY INVALID. -- NEVER SHUTDOWN COMPUTER. please retry hfcmcup command.	You must rewrite FlashROM.	*5

*1) Wait for a while and retry.
*2) Check the parameter value.
*3) Check the status of HBA port.
*4) Check the disk size and re-execute.
*5) Please update firmware again before shutting down a host.
*6) Delete unnecessary file from /tmp of the host.
*7) Check the appointed file.
*8) It is necessary to reboot host for update firmware.
*9) Please contact maintenance personnel or support service.
*10) It is not necessary to do anything.
*11) Re-execute Firmware Update. If the error occuered again, then contact maintenance personnel or support service.

HITACHI
Gigabit Fibre Channel Adapter USER'S GUIDE (Utility Software Edition-VMware)

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