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

Revision 34.0

Sep 2014

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.

MK-99COM013-08

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 all of this manual without the permission of the publisher.
- The contents of this manual are subject to change without notice.
- Despite our meticulous care to ensure the accuracy of the contents, should you find any errors or questionable issues, or if you have opinions to share with us, please contact your dealer.
- Note that we shall not be liable for the consequences of operating this product in ways not stated in this manual.

Reliability of the System Equipment

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

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

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

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

Regulatory Compliance Notices

Federal Communications Commission (FCC) Compliance

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

The user is cautioned that changes or modifications not expressly approved by the manufacturer could void the user's right to operate the equipment.

q 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.

q 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.

q Canadian Compliance Statement

The 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.

q 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.

q Export control

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

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

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

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

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

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

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

- Discard data in the “Recycle Bin”.
- “Delete” data.
- Erase data using the “Empty Recycle Bin” command.
- Perform initialization (formatting) of the hard disk using software utilities.
- Recover the factory defaults using a recovery CD.

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

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

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

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

Registered Trademarks and Trademarks

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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

q 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.

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 (r) indicates a precaution. The figure inside the triangle (r) 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 occurred, 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 is 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 as 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 be 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 Adapter.

⚠ 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.

q **User's guide**

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 on-board Firmware support matrix.
Hitachi Gigabit Fibre Channel Adapter User's Guide (Utility Software Edition)	This manual. 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)	Describes Installation and Usage of CIM utilities, CIM client and CIM provider to manage Hitachi Gigabit Fibre Channel for VMware ESXi5.0 or higher

2

Before use

Precautions

- The administrator privilege or root privilege of the system is required for executing utility software.
- On Windows, you need to install utility software, HFCTools, separately. Since HFCtools has a dependence on the driver interface, you have to install an appropriate version of HFCTools suitable for the driver. For information of the version of the utility software, refer to "Gigabit Fibre Channel Adapter User's Guide (Support Matrix Edition)".
- You need to convert driver parameters when updating or downgrading driver between the version X.Y.Z.440 and the version X.Y.Z.530 on Windows because the parameter format is different. Refer to ‘hfcmig [Windows only]’ for details.
- The utility software is categorized as hfcmgr or the following programs, which are the previous version of the programs before hfcmgr is supported.
  (1) hfcbios: Back up, restore or display HBA BIOS information. Detect devices mounted on the system.

  (2) hfcutil[Windows], hfcddutil (Red Hat Linux): Set driver paraemters and support SFP hot-swap feature.

  (3) hfcmcup: back up, restore and update the firmware file into FLASH-ROMon Hitachi Gigabit Fibre Channel board.

  (4) hfcls [Windows only] **:** Display driver information

  (5) hfcmcref: Support online-update feature of the firmware on Gigabit Fibre Channel board.

  (6) hfcmig [Windows only]: Convert the driver parameter format between for the hfcmgr and for the older utility softwares.

OS and the driver version decide which utility softwares you should use. Refer to the table below.

OS type	hfcmgr	Hfcmig	hfcutil hfcddutil hfcmputil	hfcbios	hfc mcup	hfcls	hfcmcref
Windows 2003 x86 x64, IPF	Driver version X.Y.Z.530 or higher (HFCTools version 1.0.2.22 or higher)		Driver version X.Y.Z.470 or lower (HFCTools Version 1.0.1.19 or lower)				Not supported
Windows 2008 x86, x64, IPF							Not supported
Windows 2008 R2 X64			Not supported				Not supported
Windows 2012 x64			Not supported				Not supported
Windows 2012 R2 X64			Not supported				Not supported
RHEL3 IA-32 IA-64 X86_64	Not supported	Not Supported	Supported			Not supported	Not supported
RHEL4 *1) IA-32 IA-64 X86_64	Not supported	Not Supported	Supported			Not supported	Not supported
RHEL5 *1) IA-32 IA-64 x86_64	Supported	Not Supported	Not supported			Not supported	Not supported
RHEL6 *1) IA-32 x86_64	Supported	Not Supported	Not supported			Not supported	Not supported
RHEL7 *1) x86_64	Supported	Not Supported	Not supported			Not supported	Not supported
VMware ESX Server 3.5	Not supported	Not Supported	Not supported	Not supported	Supported	Not supported	Not supported
VMware ESX 4.X	Not supported	Not Supported	Not supported	Not supported	Supported	Not supported	Supported
VMware ESX i 4.X	Not supported	Not Supported	Not supported	Not supported	Not supported	Not supported	Not supported
VMware ESX i 5.X (*1)	Not supported	Not Supported	Not supported	Not supported	Not supported	Not supported	Not supported

(*1) On VMware ESXi 5.0, you are required to install CIM provider on the host and CIM client on the remote host instead to manage Adapter. You can operate various function executing CIM client on the remote host.

For detailed operations and functions, refer to Hitachi Gigabit Fibre Channel Adapter User's Guide (Utility Software Edition – VMware).

The correspondence relationship between hfcmgr, hfcbios, hfcutil, hfcmcup and hfcls functionality

The correspondence relationship between hfcmgr, hfcbios, hfcutil, hfcmcup or hfcls are as follows.

Windows

No.	Function	hfcmgr command	Old utility command
1	Display General Information	hfcmgr –g	–
2	Display or Set the Port Information	hfcmgr –p	hfcutil menu mode hfcbios -o cfgshow -d <DEVICE> (*1) hfcbios -d <DEVICE> -p PARAMETER (*1)
3	Display or Set the Boot Information	hfcmgr –b	hfcbios -o cfgshow -d <DEVICE> (*1) hfcbios -d <DEVICE> -p PARAMETER (*1)
4	Back up or Update FLASH-ROM	hfcmgr –f	hfcmcup -d <device> -o download -f <file> hfcmcup -d <device> -o backup -f <dir>
5	Search the System Mounted Devices	hfcmgr –dv	hfcbios –o devshow
6	Back up the HBA BIOS Setup Data	hfcmgr –bk	hfcbios –o backup {-d <DEVICE>|-a} -f <DIR>
7	Restore the HBA BIOS Setup Data	hfcmgr –rs	hfcbios –o restore -d <DEVICE> -f <FILE>
8	Update or Delete WWPN in the configuration file	hfcmgr –ex	–
9	Display port statistics	hfcmgr –s	–
10	Display port attributes [Windows only]	hfcmgr –ls	hfcls
11	Isolate or Recover adapter port.	hfcmgr –sfp	–
12	Online update of the firmware	hfcmgr -u	–
13	Display version information of the utility software	hfcmgr –v	–
14	Display help information	hfcmgr -h	–
15	Target Scan	hfcmgr -scan	–
16	Performance Monitor	hfcmgr -pm	–
17	Virtual Fibre Channel Activation	hfcmgr –reset	–
18	Display target information	hfcmgr -t	–

(*1) Several parameters set by hfcbios (data_rate, connection_type, login_delay_time) can be display and set by ‘hfcmgr –p’ command.

Linux

No.	Function	hfcmgr command	Old utility command
1	Display General Information	hfcmgr –g	–
2	Display or Set the Port Information	hfcmgr –p	hfcddutil -o hfcddutil –P hfcddutil –Q hfcddutil –R hfcddutil –S hfcbios -o cfgshow -d <DEVICE> (*1) hfcbios -d <DEVICE> -p PARAMETER (*1)
3	Display or Set the Boot Information	hfcmgr –b	hfcbios -o cfgshow -d <DEVICE> (*1) hfcbios -d <DEVICE> -p PARAMETER (*1)
4	Back up or Update FLASH-ROM	hfcmgr –f	hfcmcup -d <device> -o download -f <file> hfcmcup -d <device> -o backup -f <dir>
5	Display Current Component [Linux only]	hfcmgr –c	hfcddutil -w
6	Search the System Mounted Devices	hfcmgr –dv	hfcbios –o devshow
7	Back up the HBA BIOS Setup Data	hfcmgr –bk	hfcbios –o backup {-d <DEVICE>|-a} -f <DIR>
8	Restore the HBA BIOS Setup Data	hfcmgr –rs	hfcbios –o restore -d <DEVICE> -f <FILE>
9	Update or Delete WWPN in the configuration file	hfcmgr –ex	–
10	Display port statistics	hfcmgr –s	–
11	Display target information	hfcmgr –t	–
12	Reflect driver parameter **to the new Adapter when hot-plugging**	hfcmgr -ar	–
13	Persistent Bindings [Linux only](*2)	hfcmgr –pb	hfcddutil –i hfcddutil -j [value] hfcddutil –q hfcddutil -r –W hfcddutil -r -Y -A
14	Isolate or Recover adapter port.	hfcmgr –sfp	hfcddutil –sfp hfcddutil --sfp <device> hfcddutil --sfp <device> clear
15	Online update of the firmware	hfcmgr -u	hfcmcref –d <device|all> [-c]
16	Display version information of the utility software	hfcmgr –v	hfcddutil -v
17	Display help information	hfcmgr -h	hfcddutil -h
18	Target Scan	hfcmgr -scan	-
19	Performance Monitor	hfcmgr -pm	-
20	Virtual Fibre Channel Activation	hfcmgr -reset	-

(*1) Several parameters set by hfcbios (data_rate, connection_type, login_delay_time) can be display and set by 'hfcmgr –p' command.
(*2) RHEL6 or later does not support this feature.

Updating RAMDISK Image [Linux only]

Update /boot/initrd-<kernel version>.img (/boot/initramfs-<kernel version>.img in RHEL6 or later) as RAMDISK image after installing, updating or uninstalling the device driver. Check the boot loader configuration such as grub.conf or elilo.conf. If you find the files as different name, update your RAMDISK image using the procedure below:

- **Procedure for updating RAMDISK image**

Execute the mkinitrd command according to the following procedure:
cd /boot (for IA-32/x86_64)
cd /boot/efi/efi/redhat(for IA-64)
/sbin/mkinitrd –f <image-file-name>.img <kernel version>

- **Notes on using Hitachi Dynamic Link Manager Software (HDLM)**
  Update the RAMDISK image file for HDLM in the SAN boot environment using HDLM.
  Refer to the HDLM User's Guide when using the SAN boot environment using HDLM.

Precautions on setting ’FORCE DEFAULT PARAMETER’

When you set ‘Force Default Parameter’ to enabled , the driver program operates with default parameter settings ignoring the parameter settings shown by the following table. Do not set, modify and delete parameters by executing hfcmgr when ‘Force Default Parameters’ is enabled. You should set, modify and delete parameters after you change ‘Force Default Parameter’ to disabled and reboot OS.

Table The parameter settings ignored by ‘Force Default Parameter’

No.	parameter setting	CLI command
1	Set the port information	hfcmgr -p
2	Dynamic parameter activation	hfcmgr –ar

(1) The setting value displayed by these command is the value set by hfcmgr command previously though you set‘Force Default Parameter’ to enabled, but this value is no effort and the driver program operates with default parameter after rebooting OS.

Precautions when updating Windows driver from the version X.Y.Z.470 or lower to X.Y.Z.530 or higher [Windows only]

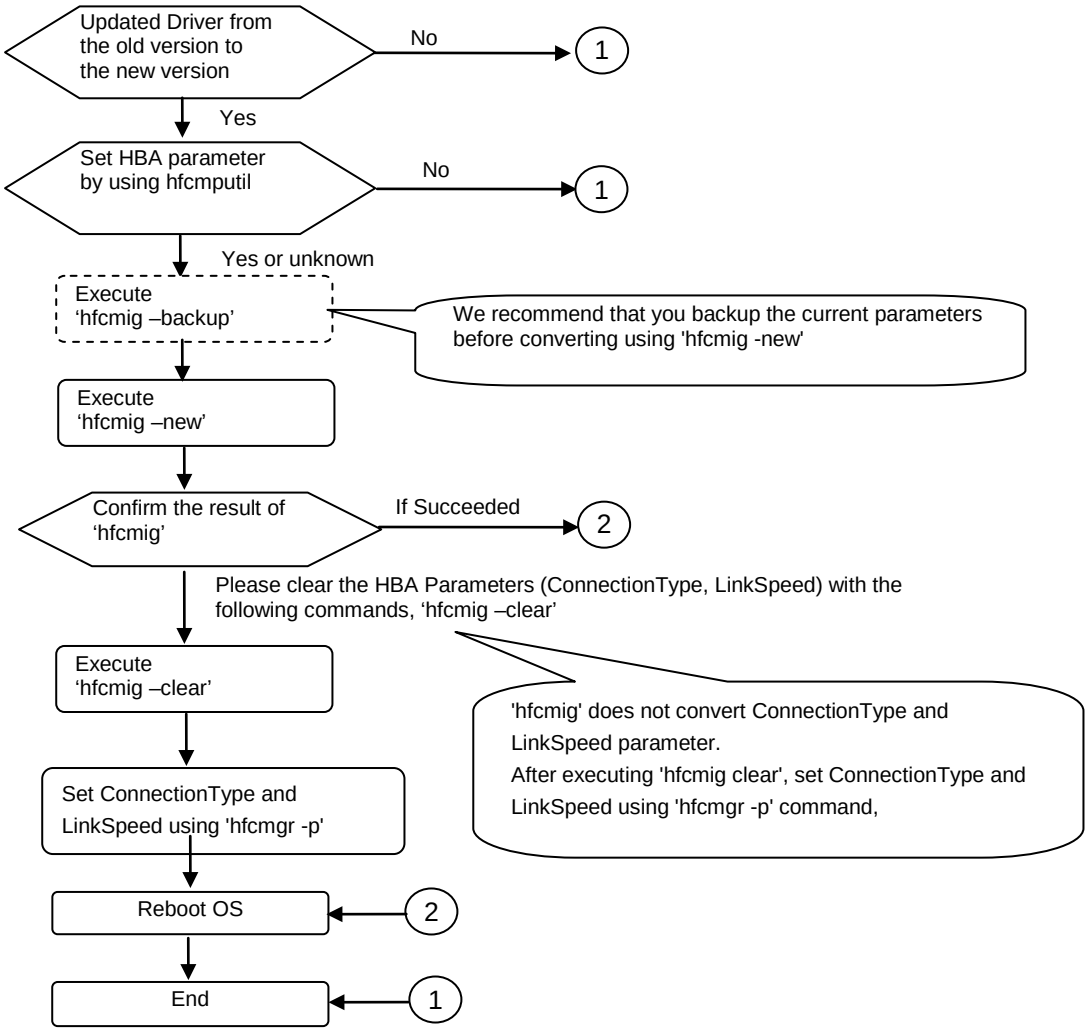
Windows driver version lower than or equal to x.y.z.470 (Corresponding HFCTools version is 1.0.1.19) and driver version higher than or equal to x.y.z.530 (Corresponding HFCTools version is 1.0.2.22) use different utility program to set parameters. In this section, we call the driver version lower than or equal to x.y.z.470 as ‘old’ driver and driver version higher than or equal to x.y.z.530 as ‘new’ driver.

Difference in utility program between old and new version

No.	Windows Driver and Tool version	Utility program
1	Driver Version lower than or equal to x.y.z.470 (HFCTools 1.0.1.19)	hfcutil.exe hfcls.exe
2	Driver Version higher than or equal to x.y.z.530 (HFCTools 1.0.2.22)	hfcmgr.exe hfcmig.exe

Both utility programs ‘hfcutil.exe’ and ‘hfcmgr.exe’ can modify driver parameters. On the other hand, ‘hfcmgr.exe’ cannot handle parameters set by using old utility program ‘hfcutil.exe’. You need to convert parameters when you update driver version lower than or equal to x.y.z.470 and version higher than or equal to x.y.z.530 using command, ‘hfcmig.exe –new’.
Refer to flow diagram in the next page for the procedure of conversion and the chapter ‘hfcmig [Windows only]’ for details.

Figure Procedure for converting parameters



Precautions when downgrading Windows driver from the version X.Y.Z.530 or higher to the version X.Y.Z.470 or lower [Windows only]

You need to convert parameters when you downgrade driver version higher than or equal to x.y.z.530 to the driver version lower than or equal to x.y.z.470.
You also need to execute ‘hfcmig.exe –old’ before uninstalling new HFCTools.
Refer to the chapter ‘hfcmig [Windows only]’ for details.

3

Install Utility software

This section describes how to install utility software of Hitachi Gigabit Fibre Channel Adapter.

Install Utility software on Windows

Install utility software

For information on how to install utility software, refer to "Gigabit Fibre Channel Adapter User's Guide". The utility software is installed by default in the “\Program Files\Hitachi\drivers\hba\HFCTools” for x86 platform or “\Program Files (x86)\Hitachi\drivers\hba\HFCTools” for x64 platform of your system disk.

The utility software for the driver version x.y.z.470 or lower is ‘hfcutil’ and the utility software for the driver version x.y.z.530 or higher is ‘hfcmgr’. You need to convert driver parameters with updating or downgrading driver because of each ‘hfcutil’ and ‘hfcmgr’ saves driver parameters depending on its own parameter format.

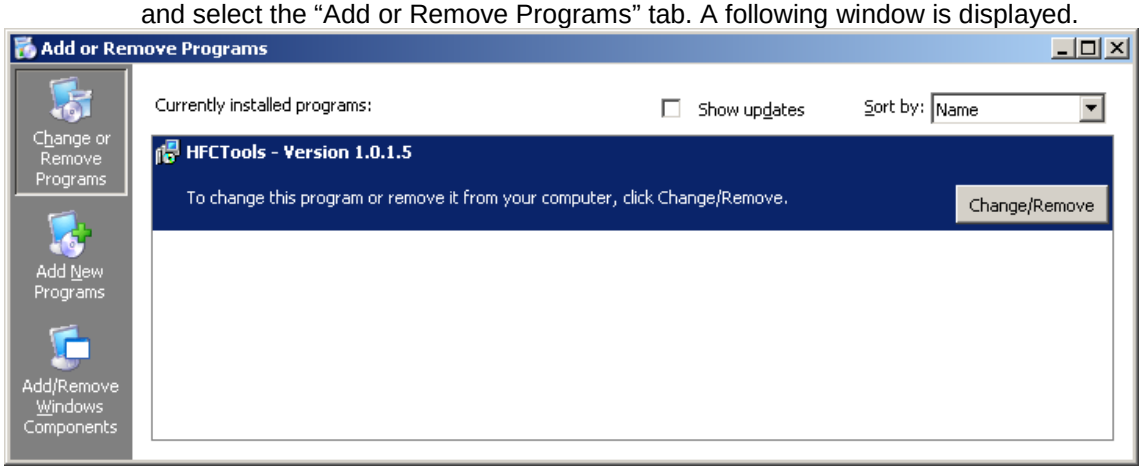
For the procedure how to confirm the driver version, refer to Hitachi Gigabit Fibre Channel Adapter User’s guide (Windows driver Edition) for details

Confirm installed utility software version

You can confirm the utility software version accorging to the following procedures.

(2) LOGON to the system by administrator privilege.

(3) Click “Start” and "Control Panel”. Select “The Add or Remove Programs window” and select the “Add or Remove Programs” tab. A following window is displayed.



Confirm logical device name

You can confirm the logical device name to execute Display port attributes [Windows only] command or hfcls on Windows. Logical device name is necessary for executing the utility software.

Install Utility software on Linux

Install utility software

The utility software is installed at the same time when the RPM package of the device driver is installed. For details of the device driver installation procedure, refer to "Gigabit Fibre Channel Adapter User's Guide (Linux/VMware driver Edition)". Be sure to install each of the following RPM packages in a set including the same <driver version>, <release version>, <kernel version> and <machine type> packages.

RPM package name

(1) RHEL5

#	RPM package name
1	hfcldd-<driver version>-<release version>.<kernel version>.<machine type>.rpm
2	hfcldd-tools-<driver version>-<release version>.<kernel version>.<machine type>.rpm

(2) SLES10 SP1

#	RPM package name
1	hfcldd-<driver version>-<release version>.< machine type>.rpm
2	hfcldd-tools-<driver version>-<release version>.<machine type>.rpm

After the installation is completed, the utility software is installed as follows:

The location which utility software is stored.

Matching OS	Utility software
Red Hat Enterprise Linux5 or higher	/opt/hitachi/drivers/hba/hfcmgr
SUSE Linux Enterprise Server 10 Service Pack 1 or higher	

Confirm installed utility software version

(1) LOGON to the system by root privilege.

(2) Execute the following command

```
# ls /proc/scsi/hfcldd
  0 1 ..... (SCSI host numbers of the recognized boards are displayed)

# more/proc/scsi/hfcldd/<scsi host number>
```

```
# more /proc/scsi/hfcldd/1
Hitachi PCI to Fibre Channel Host Bus Adapter
  Driver version 4.1.13.836  Firmware version 200789
  Package_ID              = 0x82            Driver version  (utility software version)
  Special file name       = hfcldd1         Logical device name
  Major_number            = 254
  Minor_number            = 1
  Instance_number         = 3
  Host# = 1, Unique id   = 1
  PCI memory space address= 0xffffff0000024000 (8)
  Adapter information
   Vender ID              =  1054
   Device ID              =  300b
   Port name              =  500008700030201a
   Node name              =  500008700030201b
...............
```

Confirm logical device name

Refer to Confirm installed utility software version.

4

hfcmgr

List of Commands

The user interface for this utility, hfcmgr, is CLI. The root privilege of the system is required for executing hfcmgr.

Table List of commands

No.	Function	CLI command	Supported OS		RAMDISK Updated/Not (*1)	LPAR manager	Supported OS and supported version of utility software (*2)	
			Linux	Windows			Linux	Windows
1	Display General Information	hfcmgr -g	Y	Y	N	Y	Y (1.0)	Y (1.11)
2	Display or Set the Port Information	hfcmgr -p	For version higher than or equal to 8.0, see p22. For lower than 8.0, see p36.			(*3)	Y (1.0)	Y (1.11)
3	Display or Set the Boot Information	hfcmgr -b	Y	Y	N	N	Y (1.0)	Y (1.11)
4	Back up or Update FLASH-ROM	hfcmgr -f	Y	Y	N	(*4)	Y (1.0)	Y (1.11)
5	Display Current Component [Linux only]	hfcmgr -c	Y	N	N	Y	Y (1.0)	-
6	Search the System Mounted Devices	hfcmgr -dv	Y	Y	N	N	Y (1.0)	Y (1.11)
7	Back up the HBA BIOS Setup Data	hfcmgr -bk	Y	Y	N	N	Y (1.0)	Y (1.11)
8	Restore the HBA BIOS Setup Data	hfcmgr -rs	Y	Y	N	N	Y (1.0)	Y (1.11)
9	Update or Delete WWPN in the configuration file	hfcmgr -ex	Y	Y	Y	(*5)	Y (1.0)	Y (1.11)
10	Display port statistics	hfcmgr -s	Y	Y	N	Y	Y (2.2)	Y (1.11)
11	Display target information	hfcmgr -t	Y	Y	N	Y	Y (2.2)	Y (8.0))
12	Reflect driver parameter to the new Adapter when hot-plugging	hfcmgr -ar	Y	N	N	Y	Y (2.6)	-

13	Persistent Bindings [Linux only]	hfcmgr -pb	Y	N	Y	Y	Y (1.0)	Y (1.11)
14	Display port attributes [Windows only]	hfcmgr -ls	N	Y	N	Y	-	Y (1.11)
15	Isolate or Recover adapter port.	hfcmgr -sfp	Y	Y	N	N	Y (5.1.1)	Y (1.11)
16	Online update of the firmware	hfcmgr -u	Y	Y	N	(*4)	Y(2.1)	Y(2.1)
17	Target Scan	hfcmgr -scan	Y	Y	N	Y	Y (6.9)	Y (2.16)
18	Performance Monitor	hfcmgr -pm	Y	Y	N	Y	Y (8.0)	Y (8.0)
19	Virtual Fibre Channel Activation	hfcmgr -reset	Y	Y	N	N	Y (8.0)	Y (8.0)
20	Display the version of utility software	hfcmgr –v	Y	Y	N	Y	Y (1.0)	Y (1.11)
21	Display the help menu of utility software	hfcmgr -h	Y	Y	N	Y	Y (1.0)	Y (1.11)

Y: Supported, N: Unsupported

(*1) For details of updating RAMDISK image on Linux, refer to section ‘Updating RAMDISK Image [Linux only]".
(*2) The message “Command syntax error.” will be displayed if you executed the hfcmgr version that does not support the command.
(*3) mc (Machine Check Retry Count) option is not supported in any hfcmgr version with shared FC mode. The option is supported in any hfcmgr version with dedicated FC mode.
The behavior of set, delete and display sp (LinkSpeed), ct (ConnectionType), lo (LoginDelay), mpid (Multiple PortID (hfcmgr version higher than or equal to 8.0)) options varies depending on the hfcmgr version on both shared FC and dedicated FC modes. Please see the following tables for details.

hfcmgr version: <Linux> lower than or equal to 6.8

<Windows> lower than or equal to 2.15

No.	option	LPAR manager shared FC and dedicated FC			
		display		set	delete
		operating	setting		
1	sp(LinkSpeed)	Y	N	N	N
2	ct(ConnectionType)	Y	N	N	N
3	lo(LoginDelay)	Y	N	N	N

hfcmgr version: <Linux> higher than or equal to 6.9 and lower than or equal to 7.9

<Windows> higher than or equal to 2.16 and lower than or equal to 7.9

No.	Option	LPAR manager dedicated FC				LPAR manager shared FC			
		display		set	delete	display		set	delete
		operating	setting			operating	setting		
1	sp(LinkSpeed)	Y	Y	Y	N	Y	Y	N	N
2	ct(ConnectionType)	Y	Y	Y	N	Y	Y	N	N
3	lo(LoginDelay)	Y	Y	Y	Y	Y	Y	Y	Y

hfcmgr version: <Linux> higher than or equal to 8.0 <Windows> higher than or equal to 8.0

No.	option	LPAR manager dedicated FC				LPAR manager shared FC			
		display		set	delete	display		set	delete
		operating	setting			operating	setting		
1	sp (LinkSpeed)	Y	Y	Y	N	Y	Y	N	N
2	ct (ConnectionType)	Y	Y	Y	N	Y	Y	N	N
3	lo (LoginDelay)	Y	Y	Y	Y	Y	Y	Y	Y
4	mpid (MultiplePortID)	Y	Y	Y	N	Y	Y	N	N

Any other options are supported at both shared FC and dedicated FC independent on the condition of the version.

(*4) If the driver, firmware or LPAR manager should be updated for using the commands in the guest of LPAR manager, refer to Hitachi Gigabit Fibre Channel Adapter User's Guide (Support Matrix Edition) for the supported combinations of the versions.

(*5) In the LPAR manager modes, this command is supported from the following version.

- RHEL5：The driver version higher than or equal to X.5.16.1240
- RHEL6：Supported by all versions
- Windows：HFCTools version higher than or equal to 1.0.3.37

List of Functions

This section describes the detail of the commands. The following symbols are used.
[ ]: You can omit the options in parenthesis.
{A|B}: You can select the option A or B.
<options>.. : You can select multiple <option>.

[Example]: When the command is supported on both Linux and Windows, the example is shown as Linux operation. In this case, the command is specified using the relative path on the/opt/hitachi/drivers/hba directory.

Display General Information

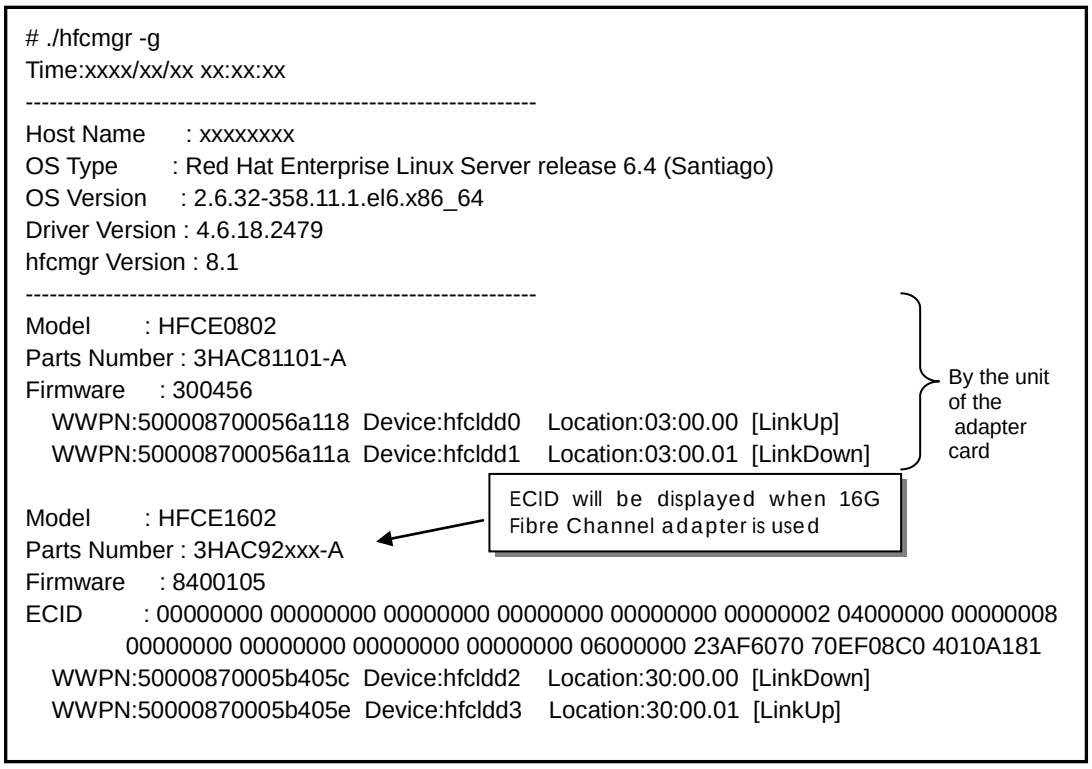
q hfcmgr higher than or equal to version 8.0

[Function] Display the server information and adapter information

[Syntax]
<Display> hfcmgr -g

[Example]

Figure Sample of hfcmgr –g display (Windows/Linux)



When Virtual Fibre Channel is used, the messages of the chart below will be displayed.

```
# ./hfcmgr -g
Time:xxxx/xx/xx xx:xx:xx
------------------------------------------------------------------
Host Name      : xxxxxxxx
OS Type        : Red Hat Enterprise Linux Server release 6.4 (Santiago)
OS Version     : 2.6.32-358.11.1.el6.x86_64
Driver Version : 4.6.18.2479
hfcmgr Version : 8.1
------------------------------------------------------------------
Model         : HFCE0802
Parts Number : 3HAC81101-A
Firmware      : 300456
    WWPN:500008700056a118  Device:hfcldd0    Location:03:00.00  [LinkUp]
    WWPN:500008700056a11a  Device:hfcldd1    Location:03:00.01  [LinkDown]

Model         : HFCE1602
Parts Number : 3HAC92xxx-A
Firmware      : 1400106
ECID          : 00000000 00000000 00000000 00000000 00000000 00000002 04000000 00000008
                00000000 00000000 00000000 00000000 06000000 23AF6070 70EF08C0 4010A181
    WWPN:50000870005b405c  Device:hfcldd2    Location:30:00.00  [LinkDown]
    WWPN:50000870005b405e  Device:hfcldd3    Location:30:00.01  [LinkUp]
        vport:1    WWPN:xxxxxxxxxxxxxxxx  [LinkUp]
```

Display Port Number, WWPN and status of the virtual port is displayed.

[Detailed description]

Table Detailed description of hfcmgr –g

(Windows/Linux, higher than or equal to hfcmgr version 8.0)

Item of display			Description	
Server information				
	HostName		Host name	
	OS Type		OS type *2	
	OS Version		OS version *2	
	Driver Version		Driver version	
	hfcmgr Version		hfcmgr (API) version	
Adapter information			This section is displayed for all adapters.	
	Model		Model name *1	
	Parts Number		Parts number	
	Firmware		Firmware version	
	ECID		Exclusive Chip ID (LSI Serial ID number): Displayed if 16G Fibre Channel adapter is used.	
	WWPN		World Wide Port Name	
	Device		Logical device name	
	Location		Bus/Dev/Func	
	[LinkStatus]		Port state	
			LinkUp	Normal operational status
			LinkDown	FC cable is not plugged.
			WaitLinkUp	Port is now transiting from Linkdown to Linkup.
			Isolate(C)	SFP is hot swappable.
			Isolate(SFPFail)	SFP is damaged.
			Isolate (SFPNotSupport)	SFP is unsupported.
			Isolate(SFPDown)	SFP is not plugged.
			Isolate(CHK-STP)	Adapter is check-stopped
	Virtual Fibre Channel Information		This information will be displayed only if a Virtual Fibre Channel is created.	
		vport	Number to identify Virtual Fibre Channel Ports	
		WWPN	World Wide Port Name of the Virtual Fibre Channel.	
		[LinkStatus]	Port status of Virtual Fibre Channel Port	
			LinkUp	Normal Status
			LinkDown	Cannot use the Virtual Fibre Channel Port
			WaitLinkUp	Wait Linkup status

*1) If the embedded FC switch module is used in Hitachi Compute Blade 320 or Hitachi Compute Blade 2000, the model name may be displayed as ‘Unknown Model’.

*2) <Windows> hfcmgr version higher than or equal to 2.19, The OS Type and OS Version are not displayed.

q **hfcmgr lower than version 8.0**

[Function] Display the server information and adapter information
[Syntax]
<Display> hfcmgr -g
[Example]

Figure Sample of hfcmgr –g display (Windows/Linux)

```
# ./hfcmgr –g
Time:xxxx/xx/xx xx:xx:xx
------------------------------------------------------------------
Host Name      : xxxxxxxx
OS Type        : Red Hat Enterprise Linux Server release 5 (Tikanga)
OS Version     : 2.6.18-8.el5
Driver Version  : 4.5.10.470
hfcmgr Version : 1.0 (API:01-00)
------------------------------------------------------------------
Model        : HFC0402
Parts Number : 3HAC51102-A
Firmware     : 200600
   WWPN:50000870003021e0  Device:hfcldd0   [LinkUp]
   WWPN:50000870003021e2  Device:hfcldd1   [LinkUp]

Model        : HFC0402
Parts Number : 3HAC51102-A
Firmware     : 204600
   WWPN:50000870003022c4  Device:hfcldd2   [LinkUp]
   WWPN:50000870003022c6  Device:hfcldd3   [LinkDown]
#
```

By the unit of the adapter card

[Detailed description]

Table Detailed description of hfcmgr –g

(Windows/Linux, lower than or equal to hfcmgr version 7.9)

Item of display		Description	
Server information			
	HostName	Host name	
	OS Type	OS type *2	
	OS Version	OS version *2	
	Driver Version	Driver version	
	hfcmgr Version	hfcmgr (API) version	
	E-Option	E-Option [Windows only] *This entry is not displayed in other environments.	
Adapter information			
	Model	Model name *1	
	Parts Number	Parts number	
	Firmware	Firmware version	
	WWPN	World Wide Port Name	
	Device	Logical device name	
	[LinkStatus]	Port state	
		LinkUp	Normal operational status
		LinkDown	FC cable is not plugged.
		WaitLinkUp	Port is now transiting from Linkdown to Linkup.
		Isolate(C)	SFP is hot swappable.
		Isolate(SFPFail)	SFP is damaged.
		Isolate (SFPNotSupport)	SFP is unsupported.
		Isolate(SFPDown)	SFP is not plugged.
		Isolate(CHK-STP)	Adapter is check-stopped

*1) If the embedded FC switch module is used in Hitachi Compute Blade 320 or Hitachi Compute Blade 2000, the model name may be displayed as ‘Unknown Model’.

*2) <Windows> hfcmgr version higher than or equal to 2.19, The OS Type and OS Version are not displayed.

Display or Set the Port Information

q hfcmgr higher than or equal to version 8.0

This section refers to the hfcmgr version higher than or equal to 8.0.
For hfcmgr version lower than 8.0, please refer to p36.
hfcmgr version can be checked by executing a command, “hfcmgr -g”.
For details, refer to “Display General Information”.

[Function] Display or Set the Port Information
[Syntax]
<Display> hfcmgr -p [{<logical-device-name>|all}]

This command shows the port information registered in /etc/hfcldd.conf on Linux and registry on Windows and the port information where the driver is currently in operation.

<Set/Delete> hfcmgr -p [delete] {<logical-device-name>|all} <options>

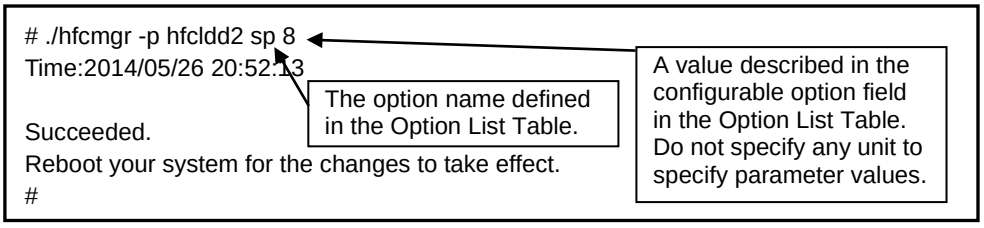
If "delete" option is specified to this command, hfcmgr deletes the specified parameter settings.
If a command-line parameter “-p all” is used instead of “-p <logical-device-name>”, hfcmgr command refers to, set, or deletes the parameters on all adapter ports in the OS.
If “force” option is specified when some parameter value is deleted, the command executes deletion without any confirmation.
For details of configurable option parameters, refer to the same entry name in the section “Driver parameters”.
For configurable option parameter name and configurable values, refer to the option list table in this section.
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 parameters value and the option name.

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



■ Indicated item name

It is the item names indicated in the display command “(hfcmgr –p [{<logical-device-name>|all}])” of the section “Display or Set the Port Information”. For details, refer to the same entry name in the section “Driver parameters”.

■ Supported OS

Parameters are different from each other depending on the OS, so appropriate parameters are used on the OS. Please refer to the option list table. Character “Y” means that corresponded parameter can be supported by the OS.

■ Configurable Adapter

There are some parameters that can only be configurable on a specified 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 an FC-HBA does not support the parameter, character “N” is put on the corresponded column.

■ 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 the parameter value can be configured for all ports or the logical device, “N” means that the parameter value cannot be configured for all ports or the logical device.

[Example] If “8” is specified to all ports or each device.

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

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

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

A character “N” is put in the row “sp” and the column “all”, therefore if “sp” option is specified for “all” adapter ports, the command execution fails.

■ Deletable

This column shows whether the specified parameter value can be deleted or not. A character “Y” means it can be deleted, and “N” means it cannot be deleted. The configured parameter can be rollbacked once to 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 the parameter value is changed. A character “Y” means that the system needs to be rebooted if the paramter value is changed and it is needed to activate. 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 ‘The parameters with a character “N” in the “Reboot required” column’.

■ RAMDISK update required [Linux only]

This column affects only on Linux systems. If one or more parameters that have a character “Y” on the corresponded column of the type of FC-HBA is changed, RAMDISK is needed to be updated to continue using the changed parameter value after reboot. This column shows RAMDISK update is required or not after the parameter value is changed. For details, refer to the section “Updating RAMDISK Image [Linux only]”. RAMDISK image is not needed when Windows is used, or not needed to be updated if any parameters that have a character “Y” on the corresponded column of the type of FC-HBA are not changed.

Option List Table

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

Option	Configurable values (unit)	Indicated item name	Supported OS		Configurable Adapters		Configurable to		Deletable	Default value	Reboot required	RAMDISK update required [Linuxonly]
			Windows	Linux	[Lesser than 8Gbps]	[16Gbps]	All ports	Logical devices				
rd *5	0-60 (sec)	Reset Delay Time	Y	Y	Y	Y	Y	Y	Y	[Lesser than 8Gbps] 7 [16Gbps] 0	N	Y
pa	0x01 0x02 0x04 0x08 0x0f 0x10 0x17 0x18 0x1b 0x1d 0x1e 0x1f	Preferred AL-PA	Y	Y	Y	Y	Y	Y	Y	0x01	Y	Y
rt	0-60 (sec)	Reset Timeout	N	Y	Y	Y	Y	Y	Y	20	N	Y
at	0-60 (sec)	Abort Timeout	N	Y	Y	Y	Y	Y	Y	8	N	Y
ar	disable enable	Abort Restrain	N	Y	Y	Y	Y	Y	Y	Disable	N	Y
qd	1-254	Queue Depth	Y		Y	Y	Y	Y	Y	32	N	N
	1-256			Y							Y	Y
mc	0-10 (times)	Machine Check	Y	Y	Y	Y	Y	Y	Y	8	N	Y
al	1-30	Allowed	N	Y	Y	Y	Y	Y	Y	5	N	Y
tr *2	off on	Target Reset Mode	N	Y	Y	Y	Y	N	Y	off	Y	Y
lt	0-60 (sec)	LUN Reset Delay	N	Y	Y	Y	Y	Y	Y	0	N	Y
sc	16-255	Scatter/Gather List	Y	N	Y	Y	Y	Y	Y	255	Y	N

Option	Configurable values (unit)	Indicated item name	Supported OS		Configurable Adapters		Configurable to		Deletable	Default value	Reboot required	RAMDISK update required [Linuxonly]
			Windows	Linux	[Lesser than 8Gbps]	[16Gbps]	All ports	Logical devices				
ms	disable enable	MSCS Mode	Y	N	Y	N	Y	N	Y	disable	Y	N
ir	int msi msix	Interrupt Type	N	Y	Y	Y	Y	Y	Y	[Lesser than 8Gbps] int [16Gbps] msix	Y	Y
lm	def disable verbose *4	Logging Mode	Y	Y	Y	Y	Y	N	Y	def	N	Y
tf	no pid	Login Target Filter	Y	Y	Y	N	Y	N	Y	no	N	Y
perf *3	disable enable	Performance Option	Y	N	Y	Y	Y	N	Y	disable	Y	N
npiv	disable enable	NPIV	Y	Y	Y	Y	Y	N	Y	disable	Y *7	Y
tfx *4	pid no	Login Target Filter 16G	Y	Y	N	Y	Y	N	N	pid	N	N
ldm *4	0-60 (sec)	MCK Link Down Time	Y	Y	N	Y	Y	Y	Y	15	N	N
lr	multi single	Link Reset Mode	Y	Y	N	Y	Y	Y	Y	multi	N	Y
lit *4	1-255 (sec)	Init Negotiation Time	Y	Y	N	Y	Y	Y	Y	120	N	N
vp	1-30	NPIV vport count	Y	Y	N	Y	Y	Y	Y	30	Y	Y
trs	disable enable	Target Restrain	N	Y	N	Y	Y	Y	Y	disable	N	Y

Option	Configurable values (unit)	Indicated item name	Supported OS		Configurable Adapters		Configurable to		Deletable	Default value	Reboot required	RAMDISK update required [Linuxonly]
			Windows	Linux	[Lesser than 8Gbps]	[16Gbps]	All ports	Logical devices				
mpid *1	disable enable	Multiple PortID	Y	Y	N	Y	N	Y	N	disable	Y	N
cc	minq rr iosize	Core Control	Y		N	Y	N	Y	Y	rr	N	N
	minq iosize cpun			Y						minq	N	Y
cc-size	1-32768 (KB)	Core Control I/O Size	Y	Y	N	Y	N	Y	Y	1024	N	Y
ic	0-300: min.unit is 10us 300-3000: min.unit is 100us (us)	Interrupt Coalescing	Y	Y	N	Y	N	Y	Y	0	N	Y
ioex	off on	Exchange per Core	Y	Y	N	Y	Y	Y	Y	off	N	Y
pm	off on	Additional Performance Monitor	Y	Y	N	Y	Y	Y	Y	off	N	Y
cch *6	0-321024 (If this parameter is set to 0, then the driver recognizes logical CPU number as this parameter)	Concurrent Channels	Y	N	N	Y	Y	Y	Y	0	Y	N

(*1) For this option, prease refer to the Notice in the section “List of Commands”.

(*2) This option is not supported in RHEL6 or later.

(*3) This option does not allow to assign logical device name.
Perf Option is only changeable in Windows 2008 or Windows 2008 R2.
In Windows 2003, the value of perf option is “disable”, and cannot be set to “enable”.
In Windows 2012 and Windows 2012 R2, the value of perf option is “enable”, and cannot be set to “disable”.

(*4) This parameter can be set for all ports by using a command-line parameter “-p all”, instead of “-p <logical-device-name>”. Though the activated parameter value for all ports are not displayed, so a logical device name should be specified to check the activated parameter value for the each ports.

(*5) In Windows 2012 and Windows 2012 R2, the value of this option is fixed to 0 second and cannot be changed.

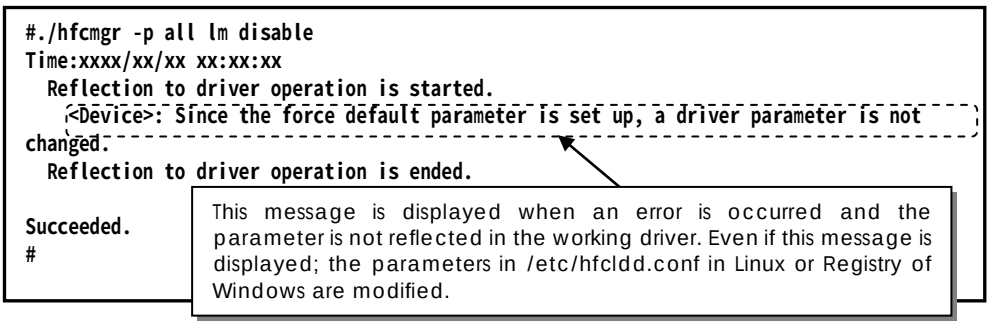
(*6) This option can be set higher than or equal to Windows2012.

(*7) The newly changed parameter can be activated by “Virtual Fibre Channel Activation” feature without rebooting the system.

The parameters with a character “N” in the “Reboot required” column

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

【Linux】RAMDISK images has to be updated to make the parameters effective after OS reboot.



#	Error message	Meaning
1	<Device>: Since the force default parameter is set up, a driver parameter is not changed.	ForceDefaultParameter is enabled so the driver parameter is not changed. For details, refer to “Display or Set the Boot Information”.
2	<Device>: HFCAPI xxxx xxxx (This error code may be different depending on the cause of the error).	Other error is occurred. Re-execute the command after a while.

[Example 1] An operation procedure to set hfcldd.conf parameters in Linux: Set Queue Depth of a specific port (hfcldd0) to 20, and all other ports to 10.
(Step 1) Refer to the parameter of hfcldd0.
“Parameter name : Current Driver parameter (stored in hfcldd.conf/FLASH-ROM)” will be displayed.
“(-)” indicates yet-to-be-set.

Figure Refer to the values of the parameters on hfcldd0

```
# ./hfcmgr -p hfcldd0
Time: xxxx/xx/xx xx:xx:xx
-------------------------------------------------------
WWPN:50000870003021e0  Device:hfcldd0   [LinkUp]
-------------------------------------------------------
Connection Type              : Point to Point[fabric] (Auto)
 Multiple PortID             : disable (disable)
 Link Speed                  : 4Gbps (Auto)
 Max Transfer Size           : 16 MB (-)
 Login Delay Time            : 3 sec (-)
 Link Down Time              : 15 sec (-)
 Reset Delay Time            : 0 sec (-)
 Preferred AL-PA             : 0x01 (-)
 Reset Timeout               : 20 sec (-)
 Abort Timeout               : 8 sec (-)
 Abort Restrain              : disable (-)
 Target Restrain             : disable (-)
 Queue Depth                 : 32 (-)
 Machine Check               : 8 (-)
 Allowed                     : 5 (-)
 LUN Reset Delay             : 0 (-)
 Interrupt Type              : MSI-X Mode (-)
 Logging Mode                : default (-)
 Login Target Filter 16G     : pid (pid)
 MCK Link Down Time          : 15 sec (-)
 Link Reset Mode             : Multi Path (-)
 Init Negotiation Time       : 120 sec (-)
 NPIV                        : disable (-)
 NPIV vport count            : 30 (-)
 Core Control                : minq (-)
 Core Control I/O Size       : 1024 KB (-)
 Exchange per Core           : off (-)
 Interrupt Coalescing        : 0 usec (-)
Additional Performance Monitor: off (-)
# /opt/hitachi/drivers/hba/hfcmgr –p
1: WWPN:50000870003021e0  Device:hfcldd0   [LinkUp]
2: WWPN:50000870003021e2  Device:hfcldd1   [LinkUp]

Enter number > 1
      :
#
```

If any port is not passed as a command-line parameter, enter the number of the port here to display the port information.

(Step 2) Set QueueDepth of hfcldd0 to 20.

Figure Procedure to set a QueueDepth value to the specified port

```
# ./hfcmgr -p hfcldd0 qd 20
Time:xxxx/xx/xx xx:xx:xx

Succeeded.
Update the RAMDISK image for the changes to take effect permanently.
Reboot your system for the changes to take effect.
# ./hfcmgr -p hfcldd0
:
Queue Depth          : 32 (20)
:
#
```

This result indicates that the QueueDepth parameter is set to 20 but the driver is currently using the value 32 for the parameter.

(Step 3) Set 10 as common QueueDepth value to all other ports.

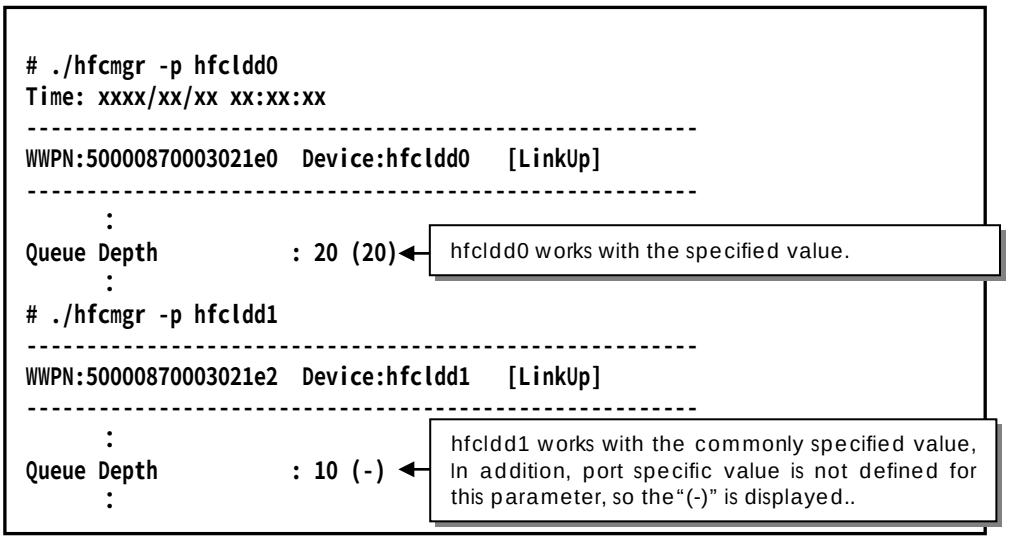
Figure Procedure to set a common QueueDepth value to all other ports

```
# ./hfcmgr -p all qd 10
Time: xxxx/xx/xx xx:xx:xx

Succeeded.
Update the RAMDISK image for the changes to take effect permanently.
Reboot your system for the changes to take effect.
# ./hfcmgr -p all
Time: xxxx/xx/xx xx:xx:xx
-------------------------------------
Common Setting of All HBA port
-------------------------------------
 Max Transfer Size            : -
 Link Down Time               : -
 Reset Delay Time             : -
 Preferred AL-PA              : -
 Reset Timeout                : -
 Abort Timeout                : -
 Abort Restrain               : -
 Target Restrain              : -
 Queue Depth                  : 10
 Machine Check                : -
 Allowed                      : -
 LUN Reset Delay              : -
 Interrupt Type               : -
 Logging Mode                 : -
 Login Target Filter          : -
 Link Reset Mode              : -
 NPIV                         : -
 NPIV vport count             : -
 Exchange per Core            : -
Additional Performance Monitor: -
#
```

(Step 4) Reboot after updating RAMDISK image.

(Step 5) Check if the configured values become effective.
Confirm hfcldd0 works with the specified value at (Step 2), and hfcldd1 works with the common value specified at (Step 3).

Figure Procedure to check the QueueDepth values of hfcldd0, hfcldd1



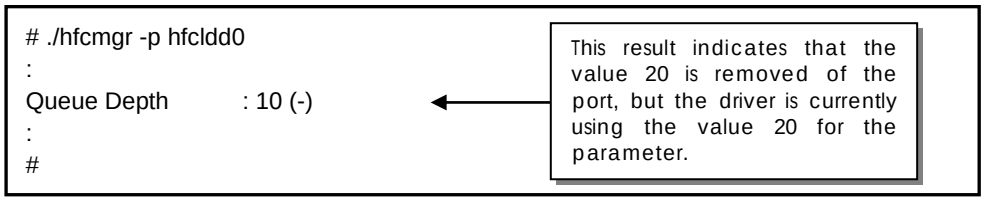
Then, remove the specified QueueDepth value for hfcldd0, and check if all ports including hfcldd0 work with commonly specified QueueDepth value, 10.

(Step 6) Remove the specified QueueDepth value of hfcldd0.
Figure Procedure to remove a specified value of a port.

```
# ./hfcmgr -p delete hfcldd0 qd
Do you execute it? (y/n) > y
Time:xxxx/xx/xx xx:xx:xx

Succeeded.
Update the RAMDISK image for the changes to take effect permanently.
Reboot your system for the changes to take effect.
# ./hfcmgr -p hfcldd0
:
Queue Depth          : 20 (-)
:
#
```

(Step 7) Reboot after updating RAMDISK image.

(Step 8) Check if the configured values are effective and hfcldd0 works with the common value specified at (Step 3).



[Example 2] An operation procedure to set FLASH-ROM parameters in Linux: Set MCK Link Down Time of a specific port (hfcldd0) to 20, and all other ports to 10.
(Step 1) Refer to the parameter of hfcldd0.
“Parameter name : Current Driver parameter (stored in hfcldd.conf/FLASH-ROM)” will be displayed.
“(-)” indicates yet-to-be-set.

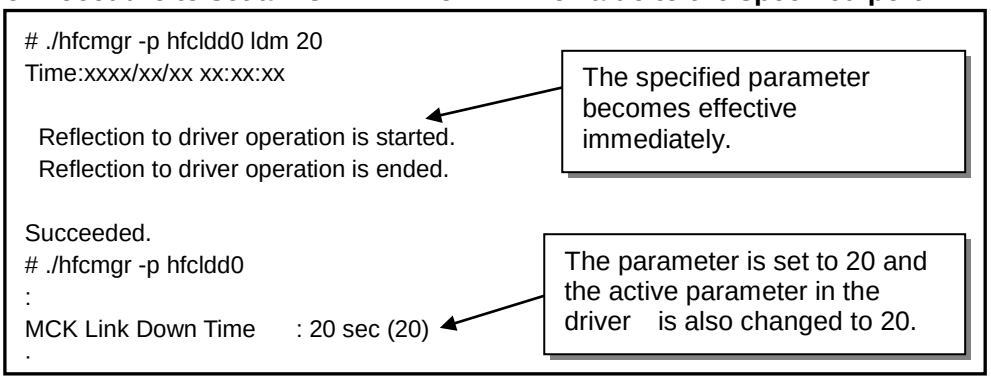
Figure Refer to the values of the parameters on hfcldd0

```
# ./hfcmgr -p hfcldd0
Time: xxxx/xx/xx xx:xx:xx
------------------------------------------------------------
WWPN:50000870003021e0  Device:hfcldd0   [LinkUp]
------------------------------------------------------------
Connection Type              : Point to Point[fabric] (Auto)
 Multiple PortID             : disable (disable)
 Link Speed                  : 4Gbps (Auto)
 Max Transfer Size           : 16 MB (-)
 Login Delay Time            : 3 sec (-)
 Link Down Time              : 15 sec (-)
 Reset Delay Time            : 0 sec (-)
 Preferred AL-PA             : 0x01 (-)
 Reset Timeout               : 20 sec (-)
 Abort Timeout               : 8 sec (-)
 Abort Restrain              : disable (-)
 Target Restrain             : disable (-)
 Queue Depth                 : 32 (-)
 Machine Check               : 8 (-)
 Allowed                     : 5 (-)
 LUN Reset Delay             : 0 (-)
 Interrupt Type              : MSI-X Mode (-)
 Logging Mode                : default (-)
 Login Target Filter 16G     : pid (pid)
 MCK Link Down Time          : 15 sec (-)
 Link Reset Mode             : Multi Path (-)
 Init Negotiation Time       : 120 sec (-)
 NPIV                        : disable (-)
 NPIV vport count            : 30 (-)
 Core Control                : minq (-)
 Core Control I/O Size       : 1024 KB (-)
 Exchange per Core           : off (-)
 Interrupt Coalescing        : 0 usec (-)
Additional Performance Monitor: off (-)
# /opt/hitachi/drivers/hba/hfcmgr –p
1: WWPN:50000870003021e0  Device:hfcldd0   [LinkUp]
2: WWPN:50000870003021e2  Device:hfcldd1   [LinkUp]

Enter number > 1
      :
#
```

If any port is not passed as a command-line parameter, enter the number of the port here to display the port information.

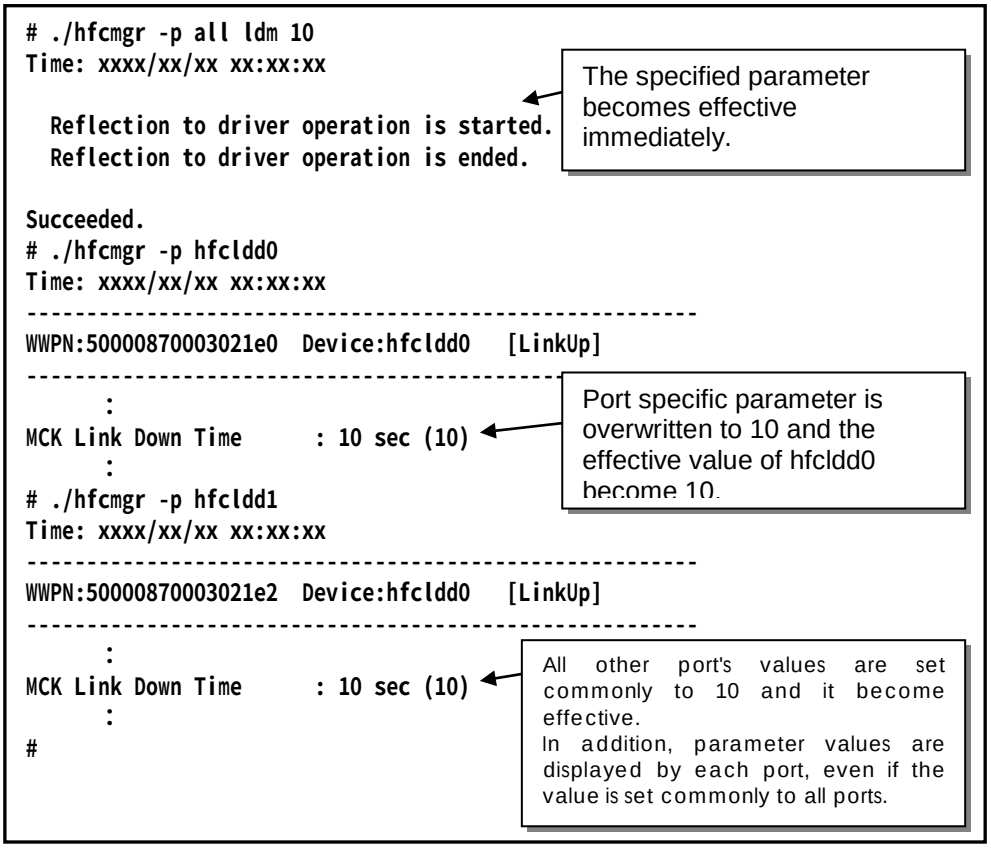
(Step 2) Set MCK Link Down Time of hfcldd0 to 20. The new value for MCK Link Down Time becomes effective immediately.

Figure Procedure to set a MCK Link Down Time value to the specified port



(Step 3) Set 10 as common MCK Link Down Time value to all other ports.
As for the parameters stored in FLASH-ROM, the latest value overwrites previous one.
Therefore, if a common value is configured, the value becomes effective for all ports including each individual port, even if the port has previously configured values.

Figure Procedure to set a common MCK Link Down Time value to all ports



q hfcmgr lower than version 8.0

This section refers to the hfcmgr version lower than 8.0.
For hfcmgr version higher than or equal to 8.0, please refer to p17..
hfcmgr version can be checked by executing a command, “hfcmgr -g”.
For details, refer to “Display General Information”.

[Function] Display or Set the Port Information
[Syntax]
<Display> hfcmgr -p [{<logical-device-name>|all}]

This command shows the port information registered in /etc/hfcldd.conf on Linux and registry on Windows and the port information that the driver is currently in operation.

<Set/Delete> hfcmgr -p [delete] {<logical-device-name>|all} <options>

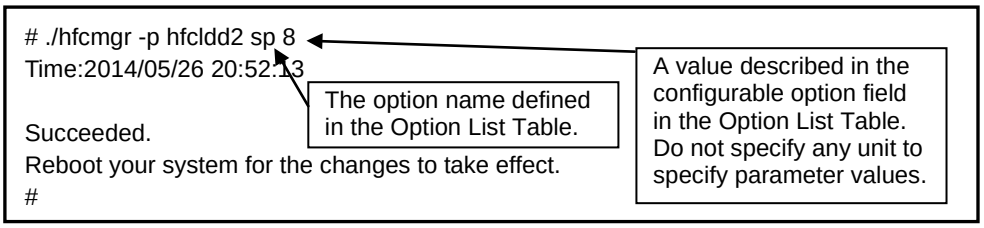
If “delete” option is specified to this command, hfcmgr deletes the specified parameter settings.
If a command-line parameter “-p all” is used instead of “-p <logical-device-name>”, hfcmgr command refers to, set, or deletes the parameters on all adapter ports in the OS.
If “force” option is specified when some parameter value is deleted, the command executes deletion without any confirmation.
For details of configurable option parameters, refer to the same entry name in the section “Driver parameters”.
For configurable option parameter name and configurable values, refer to the option list table in this section.
In the table, [4Gbps], [8Gbps] represents 4Gbps FC-HBA, 8Gbps 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 parameters value and the option name.

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



■ Indicated item name

It is the item names indicated in the display command, “(hfcmgr –p [{<logical-device-name>|all}])” of the section “Display or Set the Port Information”. For details, refer to the same entry name in the section “Driver parameters”.

■ Supported OS

Parameters are different from each other depending on the OS, so appropriate parameters are used on the OS. Please refer to the option list table. Character "Y" means that corresponded parameter can be supported by the OS.

■ Configurable Adapter

There are some parameters that can only be configurable on a specified 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 an FC-HBA does nor support the parameter, character “N” is put on the corresponded column.

■ 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 the parameter value can be configured for all ports or the logical device, “N” means that the parameter value cannot be configured for all ports or the logical device.

[Example] If “8” is specified to all ports or each device.

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

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

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

A character “N” is put in the row “sp” and the column “all”, therefore if “sp” option is specified for “all” adapter ports, the command execution fails.

■ Deletable

This column shows whether the specified parameter value can be deleted or not. A character “Y” means it can be deleted, and “N” means it cannot be deleted. The configured parameter can be rollbacked once to 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 the parameter value is changed. A character “Y” means that the system needs to be rebooted if the paramter value is changed and it is needed to activate. 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 ‘The parameters with a character “N” in the “Reboot required” column’.

■ RAMDISK update required [Linux only]

This column affects only on Linux systems. If one or more parameters that have a character “Y” on the corresponded column of the type of FC-HBA is changed, RAMDISK is needed to be updated to continue using the changed parameter value after reboot. This column shows RAMDISK update is required or not after the parameter value is changed. For details, refer to the section “Updating RAMDISK Image [Linux only]”. RAMDISK image is not needed when Windows is used, or not needed to be updated if any parameters that have a character “Y” on the corresponded column of the type of FC-HBA are not changed.

Option List Table

Option	Configurable values (unit)	Indicated item name	Supported OS		Configurable Adapters		Configurable to		Deleteable	Default value	Reboot required	RAMDISK update required [Linuxonly]
			Windows	Linux	[Lesser than 8Gbps]	[16Gbps]	All ports	Logical devices				
ct *1	auto ptop loop	Connection Type	Y	Y	Y	N	N	Y	N	auto	Y	N
sp *1	[4Gbps] auto 1 2 4 (Gbps)	Link Speed	Y	Y	Y	N	N	Y	N	auto	Y	N
	[8Gbps] auto 2 4 8 (Gbps)											
mt	1 4 8 16 32 (MB)	Max Transfer Size	Y		Y	N	Y	N	Y	16	Y	N
				Y			Y	Y			Y	Y
lo	0-60 (sec)	Login Delay Time	Y	Y	Y	N	N	Y	Y	2	Y	N
ld	0-60 (sec)	Link Down Time	Y	Y	Y	N	Y	Y	Y	15	Y	Y
rd *5	0-60 (sec)	Reset Delay Time	Y	Y	Y	N	Y	Y	Y	7	Y	Y

Option	Configurable values (unit)	Indicated item name	Supported OS		Configurable Adapters		Configurable to		Deleteable	Default value	Reboot required	RAMDISK update required [Linuxonly]
			Windows	Linux	[Lesser than 8Gbps]	[16Gbps]	All ports	Logical devices				
pa	0x01 0x02 0x04 0x08 0x0f 0x10 0x17 0x18 0x1b 0x1d 0x1e 0x1f	Preferred AL-PA	Y	Y	Y	N	Y	Y	Y	0x01	Y	Y
rt	0-60 (sec)	Reset Timeout	N	Y	Y	N	Y	Y	Y	20	Y	Y
at	0-60 (sec)	Abort Timeout	N	Y	Y	N	Y	Y	Y	8	Y	Y
ar	disable enable	Abort Restrain	N	Y	Y	N	Y	Y	Y	disable	Y	Y
qd	1-254	Queue Depth	Y		Y	N	Y	Y	Y	32	Y	N
	1-256			Y							Y	Y
mc	0-10 (times)	Machine Check	Y	Y	Y	N	Y	Y	Y	8	Y	Y
al	1-30	Allowed	N	Y	Y	N	Y	Y	Y	5	Y	Y
tr *2	off on	Target Reset Mode	N	Y	Y	N	Y	N	Y	off	Y	Y
lt	0-60 (sec)	LUN Reset Delay	N	Y	Y	N	Y	Y	Y	0	Y	Y
sc	16-255	Scatter/Gather List	Y	N	Y	N	Y	Y	Y	255	Y	N
ms	disable enable	MSCS Mode	Y	N	Y	N	Y	N	Y	disable	Y	N
ir	int msi msix	Interrupt Type	N	Y	Y	N	Y	Y	Y	int	Y	Y
lm	def disable	Logging Mode	Y	Y	Y	N	Y	N	Y	def	N	Y

Option	Configurable values (unit)	Indicated item name	Supported OS		Configurable Adapters		Configurable to		Deleteable	Default value	Reboot required	RAMDISK update required [Linuxonly]
			Windows	Linux	[Lesser than 8Gbps]	[16Gbps]	All ports	Logical devices				
tf	no pid	Login Target Filter	Y	Y	Y	N	Y	N	Y	no	N	Y
perf *3	disable enable	Performance Option	Y	N	Y	N	Y	N	Y	disable	Y	N
npiv	disable enable	NPIV	Y	Y	Y	N	Y	N	Y	disable	Y	Y

(*1) For this option, prease refer to the Notice in the section “List of Commands”.

(*2) This option is not supported in RHEL6 or later.

(*3) This option does not allow to assign logical device name.
Perf Option is only changeable in Windows 2008 or Windows 2008 R2.
In Windows 2003, the value of perf option is “disable”, and cannot be set to “enable”.
In Windows 2012 and Windows 2012 R2, the value of perf option is “enable”, and cannot be set to “disable”.

(*4) In Windows 2012 and Windows 2012 R2, the value of this option is fixed to 0 second and cannot be changed.

[Example] The procedure to set separately QueueDepth of hfcldd0 to 20 while setting the other adapters across all the ports to 10 is shown below on Linux:

(Step 1) Refer to the set value of hfcldd0.
Each item name: The current driver operation value (value set to hfcldd.conf/FLASH-ROM) is
indicated.
(-) indicates yet-to-be-set.

Figure Sample of hfcmgr –p display

```
# ./hfcmgr -p hfcldd0
Time: xxxx/xx/xx xx:xx:xx
------------------------------------------------------------
WWPN:50000870003021e0  Device:hfcldd0   [LinkUp]
------------------------------------------------------------
Connection Type      : Point to Point[fabric] (Point to Point)
Link Speed           : 1Gbps (1Gbps)
Max Transfer Size    : 16 MB (-)
Login Delay Time     : 2 sec (3)
Link Down Time       : 15 sec (-)
Reset Delay Time     : 19 sec (-)
Preferred AL-PA      : 0x01 (-)
Reset Timeout        : 20 sec (-)
Abort Timeout        : 8 sec (-)
Queue Depth          : 32 (-)
Machine Check        : 8 (-)
Allowed              : 5 (-)
Target Reset Mode    : off (-)
LUN Reset Delay      : 0 (-)
Interrupt Type       : Legacy Mode (-)
Logging Mode         : default (-)
Login Target Filter  : none (-)

# ./hfcmgr –p
1: WWPN:50000870003021e0  Device:hfcldd0   [LinkUp]
2: WWPN:50000870003021e2  Device:hfcldd1   [LinkUp]

Enter number > 1
```

If any port is not passed as a command-line parameter, enter the number of the port here to display the port information.

(Step 2) Set QueueDepth of hfcldd0 to 20.

Figure Sample of separate setting of hfcmgr –p port

```
# ./hfcmgr -p hfcldd0 qd 20
Time:xxxx/xx/xx xx:xx:xx

Succeeded.
You need reboot system after remake a ramdisk image to reflect parameter changes
to the system.
# ./hfcmgr -p hfcldd0
:
Queue Depth          : 32 (20)
:
#
```

20 is set but driver is still operating on 32.

(Step 3) Set Queue Depth to 10 by the common setting across all the adapter ports (assign "all").

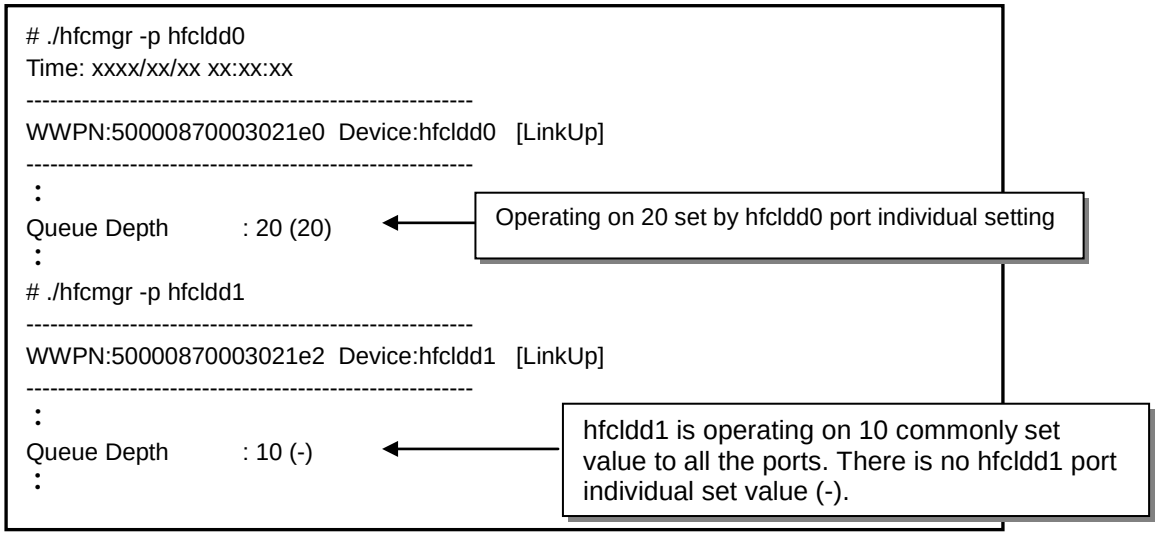
Figure Sample of hfcmgr –p all setting

```
# ./hfcmgr -p all qd 10
Time: xxxx/xx/xx xx:xx:xx

Succeeded.
You need reboot system after remake a ramdisk image to reflect parameter changes to the
system.
# ./hfcmgr -p all
Time: xxxx/xx/xx xx:xx:xx
----------------------------------------
Common Setting of All HBA port
----------------------------------------
Max Transfer Size    : -
Link Down Time       : -
Reset Delay Time     : -
Preferred AL-PA      : -
Reset Timeout        : -
Abort Timeout        : -
Queue Depth          : 10
Machine Check        : -
Allowed              : -
Target Reset Mode    : -
LUN Reset Delay      : -
Interrupt Type       : -
Logging Mode         : -
Login Target Filter  : -
#
```

(Step 4) Reboot after updating the RAMDISK image.

(Step 5) Make sure that the set information is translated. hfcldd0 operates by the separate setting of the port in (Step 2) and hfcldd1 operates by the common setting across all the adapter ports in (Step 3.)

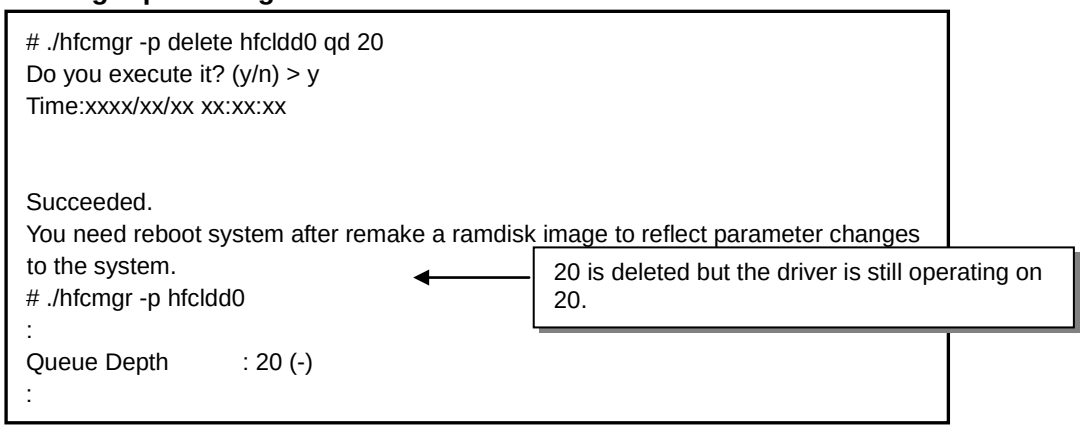
Figure Check after setting hfcmgr –p



Then, delete the separately set the QueueDepth value of hfcldd0 and make sure that all the adapter ports including hfcldd0 are operating by the commonly set value, QueueDepth 10.

(Step 6) Delete QueueDepth of hfcldd0.

Figure hfcmgr –p deleting command



(Step 7) Reboot after updating the RAMDISK image.

(Step 8) Make sure that the set information is translated. hfcldd0 operates by the common setting across all the adapter ports in (Step 3.).

Figure Check after deleting hfcmgr –p

Display or Set the Boot Information

[Function]Display or set the boot information
[Syntax]
<Display> hfcmgr -b [<logical-device-name>]
<Set> hfcmgr -b <logical-device-name> <options>..
<options>
bi {enable|disable} # BIOS
bp {enable|disable} # boot priority
bd priority <PRIORITY> wwn <WWPN> lun <LUN> # boot device
sd {enable|disable} # spinup delay
pb {enable|disable} # persistent bindings (*1)
fd {enable|disable} # forced default parameters
wn <Additional WWPN> # additional wwpn
pc <enable|disable> # pre-configured

(*1) This parameter is not available for 16G Fibre Channel Adapters.

[Example] Set HBA BIOS of hfcldd1 to "enable" to check as shown below:

Figure Sample of hfcmgr –b setting or display

```
# ./hfcmgr -b hfcldd1 bi enable
Time:xxxx/xx/xx xx:xx:xx
Succeeded.
You need reboot system to reflect setting changes to the system.
# /opt/hitachi/drivers/hba/hfcmgr -b hfcldd1
Time:xxxx/xx/xx xx:xx:xx
-------------------------------------------------------
WWPN:50000870003021e0  Device:hfcldd1   [LinkUp]
-------------------------------------------------------
BIOS                    : enable
Boot Priority           : disable

     Target WWN        LUN   Priority
-------------------------------------
  1  50060e8000c3f386   00   HIGH
  2  0000000000000000   00
  3  0000000000000000   00
  4  0000000000000000   00
  5  0000000000000000   00
  6  0000000000000000   00
  7  0000000000000000   00
  8  0000000000000000   00   LOW
Spinup Delay            : disable
Persistent Bindings     : disable
Forced Default Parameter : disable
Additional WWPN         : 0000000000000000
Pre Configure           : disable
#
```

[Detailed description]

Table Detailed description of hfcmgr –b

Item of display (Assigned parameter) Description	Default value	Settable value
BIOS (bi) Enables or disables HBA BIOS. Set to "enable" to use by the boot path.	disable	enable disable
Boot Priority (bp) Enables the boot device list. Set to "enable" to assign priority on the boot device.	disable	enable disable
Boot device list (bd) Registers the boot device (WWPN and LUN) for the priority assigned in the boot device list.	wwn: all 0 lun: 0	priority: 1-8 wwn: (WWPN) lun: 0-FFFF (*1)
Spinup Delay (sd) Sets to "enable" to insert the spinup waiting time of max. 5 minutes until the disk becomes ready.	disable	enable disable
Persistent Bindings (pb) Sets to "disable" when the persistent binding function is needed to disable. This parameter is not displayed for 16G Fibre Channel Adapters.	enable	enable disable
Forced Default Parameter (fd) Sets to "enable" to direct the driver to use the default value ignoring the set value of this tool.	disable	enable disable
Additional WWPN (wn) Can refer to or change the information set to Additional WWPN used by the Pre-configure function of Hitachi Compute Blade. (*2)	all 0	(WWPN)
Pre Configure (pc) Sets to "enable" to use the Pre-configure function after HotPlug is executed. (*2)	disable	enable disable

(*1)The value can be set from 0 to FF when the driver version is under 2x0800, while the value can be set from 0 to FFFF when the driver version is equals to 2x0800 or more.

(*2) If the N+M Cold Standby function is enabled, the function will be effective after next reboot. When the function is effective, WWPN and Pre-configure variable of the HBA will be under the control of the Hitachi Compute Blade system.

[Notes]

(1) You need to reboot the system to activate the changes after the set command is successfully executed.
(2) This “hfcmgr -b” command cannot be used if operating on the LPAR mode of Hitachi Server Virtualization Mechanism".
(3) 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.
(4) If hfcmgr version 8.0 to 8.7 is used, it might not displays Additional WWPNs stored on the FLASH-ROM.

Back up or Update FLASH-ROM

[Function]Back up or update FLASH-ROM.
[Syntax]
<Backup>
hfcmgr –f [<logical-device-name>|all] backup <backup-save-directory> [force]
<Upgrade>
hfcmgr –f [<logical-device-name>|all]] update <update-file-name> [force]
force # Omit the (y/n) confirmation message to execute the command
[Example 1]
(1) Back up the FLASH-ROM.

```
# ./hfcmgr -f hfcldd1 backup .
Time:XXXX/XX/XX XX:XX:XX
hfcmcup Ver. 2.4.0.12  Copyright(C) 2003,2004,2005,2009. Hitachi, Ltd.
--- The current microcode level for 421FF03(hfcldd1)
backup is OK?
  (Y/N) : y
--- Flash ROM Read-1
--- Flash ROM Read-2
backup finished.
backup file is /root/54100B30.21FF03.EF.500008700030ED34.BK
```

Backup file is xxxxxxxx<Firm version>.xx.<WWPN>.BK.

(2) Update the FLASH-ROM.

```
# ./hfcmgr -f hfcldd1 update ./54100B30.21FF03.EF.500008700030ED34.BK
Time:XXXX/XX/XX XX:XX:XX
hfcmcup Ver. 2.4.0.12  Copyright(C) 2003,2004,2005,2009. Hitachi, Ltd.
hfcldd1 HITACHI FC Adapter
       *** NOTICE *** NOTICE *** NOTICE ***
                  :
  (Y/N) : y
--- The current microcode level for 421FF03(hfcldd1)
--- Select microcode file: /root/54100B30.21FF03.EF.500008700030ED34.BK
File   WWN=50000870 0030ED34
Target WWN=50000870 0030ED34

CURRENT SYSREV:xxxxxxxx
UPDATE  SYSREV:yyyyyyyy
Update is OK?
  (Y/N) : y
                    :
Microcode Update finished.
The Update microcode level for yyyyyyyy(hfcldd1)
Need reboot the system to update this.
```

Check the current version and update file version.

(3) After the 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 (Windows driver Edition)' or 'Hitachi Gigabit Fibre Channel Adapter User's Guide (Linux/VMware driver Edition)' for details.

[Example 2]
The following example is to update FLASH-ROM to all logical devices.

(1) Back up the FLASH-ROM.

```
# ./hfcmgr -f all backup . force
Time:XXXX/XX/XX XX:XX:XX
hfcmcup Ver. 1.4.0.9  Copyright(C) 2003,2004,2005. Hitachi, Ltd.

>>>>>>>>>>>>>>> hfcldd0
--- The current microcode level for 220742(hfcldd0)
--- Flash ROM Read-1
--- Flash ROM Read-2
file /root/54100A30.220742.EF.500008700030F1B6.BK is exist
overwrite file.
backup finished.
backup file is /root/54100A30.220742.EF.500008700030F1B6.BK

>>>>>>>>>>>>>>> hfcldd1
--- The current microcode level for 220742(hfcldd1)
--- Flash ROM Read-1
--- Flash ROM Read-2
file /root/54100A30.220742.EF.500008700030F17A.BK is exist
overwrite file.
backup finished.
backup file is /root/54100A30.220742.EF.500008700030F17A.BK
#
```

(2) Update the FLASH-ROM.

```
# ./hfcmgr -f all update /root/54100A30.220742.EF.500008700030F17A.BK
Time:XXXX/XX/XX XX:XX:XX
hfcmcup Ver. 1.4.0.9  Copyright(C) 2003,2004,2005. Hitachi, Ltd.

>>>>>>>>>>>>>>> hfcldd0
hfcldd0 HITACHI FC Adapter
       *** NOTICE *** NOTICE *** NOTICE ***

 The microcode installation occurs while the
 adapter and any attached drives are available
 for use. It is recommended that this installation
 be scheduled during non-peak production periods.

 As with any microcode installation involving
 drives, a current backup should be available.

 Use 'y' to continue the installation.
 Use 'n' or Ctrl-c to cancel the installation.
  (Y/N) : y
--- The current microcode level for 220742(hfcldd0)
--- Select microcode file: /home/okamoto/54100A30.220742.EF.500008700030F17A.BK
File   WWN=50000870 0030F17A
Target WWN=50000870 0030F1B6
Input data error.(WWN is wrong)

>>>>>>>>>>>>>>> hfcldd1
hfcldd1 HITACHI FC Adapter
       *** NOTICE *** NOTICE *** NOTICE ***
～～～ Omission ～～～

Microcode Update finished.
The Update microcode level for 220742(hfcldd1)
Need reboot the system to update this.

>>>>>>>>>>>>>>> hfcldd2 SKIP(already update)

<Result of all adapter update>
Adapter #1: FAIL (FlASH SYSREV 00220740)
  hfcldd0: FAIL
Adapter #2: SUCCESS (FLASH SYSREV 00220740 -> 00220742)
  hfcldd1: SUCCESS
  hfcldd2: SKIP
#
```

Update failed because the specified backup file and WWPN of the adapter port does not match

'hfcldd2' belongs to the same board as hfcldd1. FLASH-ROM data has already updated as 'hfcldd1', so update is skipped for hfcldd2.

Display the result at the end of the command.

(3) After the FLASH-ROM update is successfully completed, you need to transfer the FLASH-ROM data. Refer to the example 1.

[Example 3]

Occasionally, the message below is displayed and the command exits, depending on the status of the adapter. In such a case, wait a while and re-execute the command.

(1)

```
# ./hfcmgr -f all update <Backup File>
Time:20xx/11/27 19:16:47
hfcmcup Ver. 2.4.0.20  Copyright(C) 2003, 201x, Hitachi, Ltd.

>>>>>>>>>>>>>>> hfcldd0
hfcldd0 HITACHI FC Adapter
       *** NOTICE *** NOTICE *** NOTICE ***

 The microcode installation occurs while the
 adapter and any attached drives are available
 for use. It is recommended that this installation
 be scheduled during non-peak production periods.

 As with any microcode installation involving
 drives, a current backup should be available.

 Use 'y' to continue the installation.
 Use 'n' or Ctrl-c to cancel the installation.
  (Y/N) : y
--- The current microcode level for xxxxxx(hfcldd0)
--- Select microcode file: <Backup File>
File   WWN=xxxxxxxx xxxxxxxx
Target WWN=xxxxxxxx xxxxxxxx

CURRENT SYSREV:xxxxxxxx
UPDATE  SYSREV:xxxxxxxx

Update is OK?
  (Y/N) : y

Adapter status busy. please try again later.
```

In case an update interruption occurred, the hfcmgr command displays an error message.

[Notes]For the supported version of the driver, firmware and LPAR manager for this commands from the guest of LPAR manager, refer to Hitachi Gigabit Fibre Channel Adapter User's Guide (Support Matrix Edition) for details.

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

(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) To update, back up or restore the FLASH-ROM usually requires 5 to 10 minutes on Windows. However over 60 minutes may be required depending on your server configuration. If your system does not complete these operations over the 10 minutes, refer to the section 'How to shorten the firmware update processes on 'Hitachi Gigabit Fibre Channel Adapter User's Guide (Windows driver Edition).

(6) If you execute the update using 'all' option, the execution continues for the next port when the update process failed for the current adapter port. You can specify only one update file. Hitachi Gigabit Fibre Channel Adapter has its own binary file for FLASH-ROM depending on its device ID. If there are multiple types of Hitachi Gigabit Fibre Channel Adapter exist on the same system and execute the update command specifying 'all' option, the command always display the error. FLASH-ROM backup file stored by backup command has WWN inside the file. So the error is displayed except for the target adapter which has the same WWN.

(7) For error messages when executing update or backup commands, refer to [Error message] in the section "hfcmcup-Back up and Update FLASH-ROM.

Display Current Component [Linux only]

[Function] Display the configuration that the driver is currently recognizing and operating on.
[Syntax]
<Display> hfcmgr –c

[Example]

Figure Sample of hfcmgr –c display

```
# ./hfcmgr -c
Time:xxxx/xx/xx xx:xx:xx
------------------------------------------------------
WWPN:5000087000300130  Device:hfcldd0   [LinkUp]
------------------------------------------------------
TargetID   : 000
TargetWWPN : 50060e8000427810
TargetWWNN : 50060e8000427810

#
------------------------------------------------------
WWPN:5000087000300020  Device:hfcldd1   [LinkUp]
------------------------------------------------------
TargetID   : 000
TargetWWPN : 50060e8000427810
TargetWWNN : 50060e8000427810

#
```

[Details of display]

Table Details of hfcmgr –c display

No.	Item of display	Description
1	Adapter information	
	WWPN	Adapter WWPN
	Device	Logical device name
2	Target information	
	TargetID	Target ID (0-255)
	TargetWWPN	Target WWPN
	TargetWWNN	Target WWNN

[Notes]
(1) This command displays the configuration that the driver is currently recognizing and operating on. Register this configuration in the /etc/hfcldd.conf file with the "Persistent Bindings" command and have the driver recognized by updating and rebooting RAMDISK. The configuration of the /etc/hfcldd.conf file can be checked by displaying it using the "Persistent Bindings" command.

Search the System Mounted Devices

[Function] Searches each device mounted on the system
[Syntax]
<Display> hfcmgr –dv

[Example]

Figure Sample of hfcmgr –dv display

```
# ./hfcmgr -dv
Time:xxxx/xx/xx xx:xx:xx
Device    DeviceID   BUS#  DEV#  FUNC#   WWPN                Original WWPN
hfcldd0   300B1054     5     1     0     50000870003021e0    50000870003021e0
hfcldd1   300B1054     5     1     1     50000870003021e2    50000870003021e2
#
```

Table Details of hfcmgr –dv display

No.	Item of display	Description
1	Device	Logical device name
2	DeviceID	Device ID
3	BUS/DEV/FUNC	PCI BUS/DEV/FUNC number
4	WWPN	Adapter WWPN
5	Original WWPN	WWPN indicated on the adapter body (the white label)

[Notes]

(1) This command cannot be used if operating on the LPAR mode of Hitachi Server Virtualization Mechanism".

Back up the HBA BIOS Setup Data

[Function] Current setup data for HBA BIOS is displayed. Confirm if all data is correct then take backup.

[Syntax]
hfcmgr –bk { <logical-device-name>| all } <save-directory> [force]
all # Perform on each adapter port
force # Omit the (y/n) confirmation message to execute the command
[Example]

Figure Sample of hfcmgr –bk execution

```
# ./hfcmgr -bk hfcldd1 .

Current BIOS configure data (hfcldd1)
BIOS                    : disable
Boot Priority           : disable

     Target WWN        LUN   Priority
-------------------------------------
  1  5000001234567890   01   HIGH
  2  0000000000000000   00
  3  0000000000000000   00
  4  0000000000000000   00
  5  0000000000000000   00
  6  0000000000000000   00
  7  0000000000000000   00
  8  0000000000000000   00   LOW
Spinup Delay            : disable
Connection Type         : Auto
Data Rate               : Auto
Persistent Bindings     : enable
Forced Default Parameter : disable
Additional WWPN         : 0000000000000000
Login Delay Time        : 3 sec
Pre Configure           : disable

BIOS data backup command.

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

Time:xxxx/xx/xx xx:xx:xx
Backup of ./300B1054.05.01.00.00.BK for hfcldd1.

Succeeded.
#
```

[Detailed description]

Table Detailed description of hfcmgr –bk

No.	Item	Description
1	BIOS	Data set by "Display or Set the Boot Information, hfcmgr –b"
2	Boot Priority	
3	Spinup Delay	
4	Persistent Bindings	
5	Forced Default Parameter	
6	Additional WWPN	
7	Pre Configure	
8	Connection Type	Connection type set by "Display or Set the Port Information, hfcmgr –p ct"
9	Data Rate	Link speed set by "Display or Set the Port Information**,** hfcmgr –p sp"
10	Login Delay Time	Login Delay Time set by "Display or Set the Port Information**,** hfcmgr –p lo"

[Notes]

(1) This command cannot be used if operating on the LPAR mode of Hitachi Server Virtualization Mechanism".
(2) You may not 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.
(3) If hfcmgr version 8.0 to 8.7 is used and all of the HBA BIOS Setup Data on your system is needed to backup, please specify ‘force’ parameter to the command.
(4) If hfcmgr version 8.0 to 8.7 is used, it might not displays Additional WWPNs stored on the FLASH-ROM.

Restore the HBA BIOS Setup Data

[Function] The HBA BIOS setup data in the restore file is displayed. Make sure that the value to be set is contained and restore it.

[Syntax]

hfcmgr –rs <logical-device-name> <restore-file-name> [force]

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

[Example]

Figure Sample of hfcmgr –rs execution

```
# ./hfcmgr -rs hfcldd2 ./300B1054.05.01.01.00.BK

Backup data
BIOS                    : disable
Boot Priority           : enable

     Target WWN        LUN   Priority
-----------------------------------
  1  0000000000000000   00   HIGH
  2  5000087000123456   00
  3  0000000000000000   00
              :
Additional WWPN         : 0000000000000000
Login Delay Time        : 3 sec
Pre Configure           : disable

BIOS data restore command.

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

Time:xxxx/xx/xx xx:xx:xx

Succeeded.
You need reboot system to reflect setting changes to the system.
#
```

[Detailed description]

Refer to [Detailed description] in "Back up the HBA BIOS Setup Data."

[Notes]

(1) In order to translate into the driver after the set command is successfully executed, the system must be rebooted.

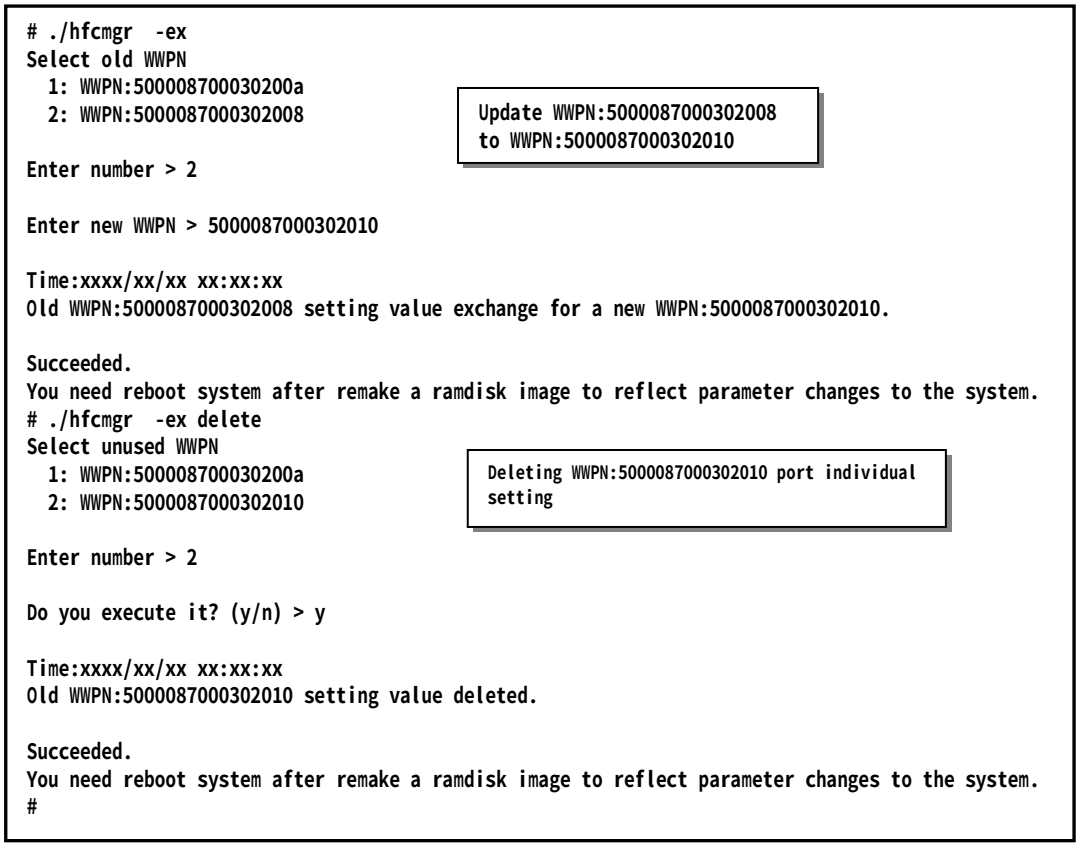
(2) This command cannot be used if operating on the LPAR mode of Hitachi Server Virtualization Mechanism.

(3) 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.

Update or Delete WWPN in the configuration file

[Function] The information set by the unit of the adapter port using the port information (hfcmgr –p) command, etc. is saved with its corresponding WWPN to the configuration file, which is /etc/hfcldd.conf file in Linux and to the Registry in Windows.
This command can update WWPN contained in the configuration file. (*1) When you replace the adapter, you can apply port individual setting values to the replaced adapter port using this command. You may use the delete command if you do not need the port individual setting value.
(*1) WWPN of the adapter cannot be updated.
[Syntax]
<Update> hfcmgr –ex [<WWPN> new <WWPN>]
<Delete> hfcmgr –ex delete [<WWPN>] [force]
<WWPN> new < WWPN> # WWPN to be updated and new WWPN
delete <WWPN> # WWPN to delete the port individual setting value
force # Omit the (y/n) confirmation message to execute the command
[Example]
When assigning <WWPN> is omitted, display the list of the port individually set <WWPN> to select.

Figure Sample of hfcmgr –ex execution




```
# ./hfcmgr  -ex
Select old WWPN
  1: WWPN:500008700030200a
  2: WWPN:5000087000302008

Enter number > 2

Enter new WWPN > 5000087000302010

Time:xxxx/xx/xx xx:xx:xx
Old WWPN:5000087000302008 setting value exchange for a new WWPN:5000087000302010.

Succeeded.
You need reboot system after remake a ramdisk image to reflect parameter changes to the system.
# ./hfcmgr  -ex delete
Select unused WWPN
  1: WWPN:500008700030200a
  2: WWPN:5000087000302010

Enter number > 2

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

Time:xxxx/xx/xx xx:xx:xx
Old WWPN:5000087000302010 setting value deleted.

Succeeded.
You need reboot system after remake a ramdisk image to reflect parameter changes to the system.
#
```

[Notes]

(1) If the Additional WWPN is used with Pre-configure function of Hitachi Compute Blade, you do not need to update the WWPN by using this command.

(2) [Linux] You need to update the RAMDISK image and reboot the system in order to enable the new settings after the set or delete commands have been successfully executed. For details to update the RAMDISK image, refer to section 'Notes on Updating the RAMDISK Image'.
[Windows] You need to reboot the system in order to enable the new settings after the set or delete commands have been successfully executed.

(3) This command cannot be used if operating on the LPAR mode of Hitachi Server Virtualization Mechanism.

(4) This command updates WWPN registered in the /etc/hfcldd.conf file on Linux and registry on Windows. Port individual settings are stored together with WWPN, so those settings are applied to the adapter port after replacement. The flash setting data is not covered by this command and it can be applied to a new adapter using section 'Back up the HBA BIOS Setup Data' and section 'Restore the HBA BIOS setup data'. You are able to take over each setting for old adapter to new adapter referring the following commands;

Table Takeover procedure for each set data

No.	Setting data	Takeover command
1	The port information include the following term; • Connection Type • Link Speed • Login Delay Time • Login Target Filter (for 16GbpsADAPT) • MCK Link Down Time • Link Init Negotiation Time • Multiple PortID	Back up the HBA BIOS Setup Data Restore the HBA BIOS Setup Data
2	The port information include the following term; • port information except Connection Type, Link Speed and Login Delay Time.	Update or Delete the Port Individual Setting Information
3	The boot information	Back up the HBA BIOS Setup Data Restore the HBA BIOS Setup Data
4	The Persistent Binding information [Linux only]	Update or Delete the Port Individual Setting Information

(5) In the LPAR manager modes, this command is supported from the following version.
- RHEL5：The driver version higher than or equal to X.5.16.1240
- RHEL6：Supported by all versions
- Windows：HFCTools version higher than or equal to 1.0.3.37

Display port statistics

[Function] Display port statistics. You can specify the monitoring counts and period.
[Syntax]

hfcmgr –s <logical-device-name> {<options>}

<options>
count <count> # monitoring counts (1-256) (Default:1)
interval <interval> # period of monitoring (sec) (1-30) (Default:5)
When you stop displaying monitoring information, press Ctrl+C.

[Example]

Figure Sample of executing hfcmgr -s [driver version X.Y.Z.650]

```
# ./hfcmgr -s hfcldd1 count 11 interval 2
Time:xxxx/xx/xx xx:xx:xx
-------------------------------------------------------
 WWPN:50000870003022de  Device:hfcldd1   [LinkUp]
-------------------------------------------------------
  No   LIPCount   NOSCount   LossSync LossSignal   LinkFail    IORequest ScsiTimeout    Time
   1          2          2          2          0          2      17137            0  00:42:47
   2          2          2          2          0          2      17137            0  00:42:49
                                :
   9          2          2          2          0          2      17137            0  00:43:03
  10          2          2          2          0          2      17137            0  00:43:05

  No   LIPCount   NOSCount   LossSync LossSignal   LinkFail    IORequest ScsiTimeout    Time
  11          2          2          2          0          2      17137            0  00:43:07
#
```

[Details of display]

Table Details of hfcmgr –s display

No.	Item of display	Description
1	LIPCount	LIP Count
2	NOSCount	NOS Count
3	LossSync	Loss of Sync
4	LossSignal	Loss of Signal
5	LinkFail	Link Failure Count
6	IO Request【Linux】	IO Request
7	ScsiTimout	Scsi Timeout Failure
8	Time	Monitored time

[Notes]

(1) Monitoring data from 1 to 6 is the total amount of monitoring data over shared guests if operating on the LPAR mode of Hitachi Server Virtualization Mechanism.
(2) Monitoring data from 1 to 5 is displayed with '---', when the adapter port is isolated.

Figure Sample of executing hfcmgr -s [driver version X.Y.Z.670 or higher]

```
# ./hfcmgr -s hfcldd1 count 11 interval 2
Time:2009/12/19 13:10:24
------------------------------------------------------------
 WWPN:23100000870cc09c  Device:scsi0     [LinkUp]
------------------------------------------------------------
 No.   1
 TxFrames    : 0000000000000199107   TxWords      : 00000000000078821776
 RxFrames    : 0000000000000333613   RxWords      : 00000000000135497613
 LIPCount    : 00000000000000000000  NOSCount     : 00000000000000000000
 ErrorFrame  : 00000000000000000000  LinkFailure  : 00000000000000000000
 LossOfSync  : 00000000000000000000  LossOfSignal : 00000000000000000000
 InvalidCRC  : 00000000000000000000  ScsiTimeout  : 00000000000000000000
 Time : 13:10:24
```

[Details of display]

Table Details of hfcmgr –s display

No.	Item of display	Description
1	TxFrames	TxFrames (Driver's statistic)
2	TxWords	TxWords (Driver's statistic)
3	RxFrames	RxFrames (Driver's statistic)
4	RxWords	RxWords (Driver's statistic)
5	LIPCount	LIPCount
6	NOSCount	NOSCount
7	ErrorFrame	ErrorFrame
8	LossOfSync	LossOfSync
9	LossOfSignal	LossOfSignal
10	LinkFailure	LinkFailure
11	InvalidCRC	InvalidCRC
12	**ScsiTimeout** [Linux only]	**ScsiTimeout** [Linux driver only]
13	Time	Time

[Notes]

(1) For No.5 to 11, total of all shared fc ports is displayed, and for No.1 to 4 and 12, the value of each shared fc port is displayed in LPAR manager shared FC environment.

(2) In virtual fibre channel with Windows Server 2012, Server 2012 R2 Hyper-V and RHEL KVM environment, only physical port's statistics is displayed.
Virtual fibre channel port's statistics is not displayed.

Display target information

[Function] Display target information of each physical port. This command does not display information of targets connected to virtual fibre channel ports.
[Syntax]
hfcmgr –t

[Example]

Figure Sample of executing hfcmgr –t

```
# ./hfcmgr -t
Time:xxxx/xx/xx xx:xx:xx
-------------------------------------------------------
 WWPN:50000870003022dc  Device:hfcldd0   [LinkDown]
-------------------------------------------------------
   No Target

-------------------------------------------------------
 WWPN:50000870003022de  Device:hfcldd1   [LinkUp]
-------------------------------------------------------
 TargetWWPN:50060e8000c3f386  TargetWWNN:50060e8000c3f386
  LUN:0    Size:   4297MB  Vendor:HITACHI   Model:DF600F
  LUN:1    Size:   4297MB  Vendor:HITACHI   Model:DF600F
  LUN:2    Size:   4297MB  Vendor:HITACHI   Model:DF600F
#
```

[Details of display]

Table Details of hfcmgr –t display

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

Reflect driver parameter to the new Adapter when hot-plugging

- **hfcmgr higher than or equal to version 8.0**

[Function] This command reflects the parameter settings explained at “Display or Set the Port Information” from the old hot-removed Adapter to the new hot-added Adapter. For details on hot-remove or hot-add Adapter, refer to the section “” in “Hitachi Gigabit Fibre Channel Adapter User’s Guide (Linux/VMware driver Edition)”.

[Syntax]

hfcmgr –ar {<logical device name>|all} [force]
force # Omit the (y/n) confirmation message at time of delete
"All" refers to assigning by the host unit (Refer, set or delete is the common setting value across all the adapter ports)

[Example] Reflect driver parameter to the new hot-plugged adapter

```
# ./hfcmgr -ar all

Adapter parameters are re-read.

Do you execute? (y/n) > y

Time:xxxx/xx/xx xx:xx:xx

Succeeded.
#
```

q hfcmgr lower than version 8.0

[Function] You can change parameter settings immediately while system is running. Meanwhile this function allows you to change parameters settings temporary. When you change parameter settings permanently, you need to update the RAMDISK image after changing parameters. For details to update the RAMDISK image, refer to section ‘Notes on Updating the RAMDISK Image’.

[Syntax]

hfcmgr –ar {<logical device name>|all} <options>

"All" refers to assigning by the host unit (Refer, set or delete is the common setting value across all the adapter ports

<options>

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

[Example] The procedure to set separately LinkDownTime of hfcldd0 to 10 while set Machine Check Retry Count to 1 across all ports using the command described in section 4.2 ‘Display or Set the Port Information’. Then change LinkDownTime of hfcldd0 to 10 dynamically.

(Step 1) Set LinkDownTime of hfcldd0 to 10 and set Machine Check retry count to 1 across all ports.

Figure Sample of executing hfcmgr -p

```
# ./hfcmgr -p hfcldd0 ld 10
Time:xxxx/xx/xx xx:xx:xx

Succeeded.
You need reboot system after remake a ramdisk image to reflect parameter changes
to the system.
# ./hfcmgr –p all mc 1
Time:xxxx/xx/xx xx:xx:xx

Succeeded.
You need reboot system after remake a ramdisk image to reflect parameter changes
to the system.

# ./hfcmgr -p hfcldd0
:
Link Down Time      : 10 sec (15)
Machine Check       : 8  (-)
:
#
```

Driver is running with default value and new setting is not applied.

(Step 2) Execute command for the changes to hfcldd0 to take effect.

Figure Sample of executing hfcmgr -ar

```
# ./hfcmgr -ar hfcldd0

Adapter parameters will be changed immediately.
This operation may affect operations running on the adapter port.

Do you really change the adapter port? (y/n) > y

Time:xxxx/xx/xx xx:xx:xx

Succeeded.
#
```

(Step 3) Confirm whether new parameter setting is applied.

Figure Sample of executing hfcmgr -p

```
# ./hfcmgr -p hfcldd0
:
Link Down Time       : 10 (10)
Machine Check        : 1  (-)
:
#
```

This command cannot change the following parameters dynamically.

Table Parameters which is not applied dynamically

No.	Section	Parameters which is not applied dynamically
1	Display or Set the Port Information	Connection Type Link Speed Login Delay Time Queue Depth Preferred AL-PA Max Transfer Size

Persistent Bindings [Linux only]

[Function]You can fix the configuration information using the configuration information persistent binding function (**persistent bindings** (*1)). You can have the configuration recognized on the system created automatically as the persistent binding information to register it in /etc/hfcldd.conf.

[Syntax]

<Display> hfcmgr –pb

Displays the registered configuration information (*2)

<Set> hfcmgr –pb create

Automatically creates the current connection configuration information to register

<Set> hfcmgr –pb automap {on|off}

Automap Information. To run Persistent Bindings, you need to turn it off.

<Delete> hfcmgr –pb delete

Cancels all the current connection configuration information

(*1) RHEL6 or later does not support this feature.
(*2) The configuration information that the driver recognizes and is currently running can be checked by "4.5 Display Current Component".

[Example]

● The procedure for using Persistent Bindings is shown below:

(Step 1) Automatically create the current configuration information

Figure Sample of hfcmgr –pb automatic setting

```
# ./hfcmgr -pb create
Time:xxxx/xx/xx xx:xx:xx
--------------------------------------------
 WWPN : 5000087000300130  Device : hfcldd0
--------------------------------------------
TargetID   : 000
TargetWWPN : 50060e8000427810
TargetWWNN : 50060e8000427810

--------------------------------------------
 WWPN : 5000087000300020  Device : hfcldd1
--------------------------------------------
:

Succeeded.
You need reboot system after remake a ramdisk image to reflect parameter changes to the system.
#
```

(Step 2) Turn off Automap to enable this configuration information to check.
It is not yet translated into the driver operation at this time.

Figure Sample of hfcmgr –pb automap setting

```
# ./hfcmgr -pb automap off
Time:xxxx/xx/xx xx:xx:xx

Succeeded.
You need reboot system after remake a ramdisk image to reflect parameter changes to the system.
# /opt/hitachi/drivers/hba/hfcmgr -pb
Time:xxxx/xx/xx xx:xx:xx
Automap            : off
-----------------------------------------------------
WWPN: 5000087000300130  Device:hfcldd0   [LinkUp]
-----------------------------------------------------
TargetID   : 000
TargetWWPN : 50060e8000427810
TargetWWNN : 50060e8000427810

-----------------------------------------------------
WWPN: 5000087000300020  Device:hfcldd1   [LinkUp]
-----------------------------------------------------
TargetID   : 000
TargetWWPN : 50060e8000427810
TargetWWNN : 50060e8000427810
#
```

● The procedure for deleting Persistent Bindings is shown below:
(Step 1) Turn Automap back to ON to delete the configuration information.

Figure Sample of hfcmgr –pb delete execution

```
# ./hfcmgr -pb delete
Do you execute it? (y/n) > y

Time:xxxx/xx/xx xx:xx:xx

Succeeded.
You need reboot system after remake a ramdisk image to reflect parameter changes to the
system.
# /opt/hitachi/drivers/hba/hfcmgr -pb automap on
Time:xxxx/xx/xx xx:xx:xx

Succeeded.
You need reboot system after remake a ramdisk image to reflect parameter changes to the
system.
#
```

(Step 2) Reboot after updating the RAMDISK image to translate into the driver.

[Detailed description]

Table Detailed description of hfcmgr –pb

No.	Item of display		Description
1	Automap		on/off Need to turn off to use the persistent binding function.
2	Adapter information		
		WWPN	Adapter WWPN
		Device	Logical device name
3	Targeted information		
		TargetID	Target ID (0-255)
		TargetWWPN	Target WWPN
		TargetWWNN	Target WWNN

[Notes]

(1) After updating the set value using this command, in order to translate it into the driver, reboot after updating the RAMDISK image by referring to "5.1 Notes on Updating the RAMDISK Image".

(2) This command edits and displays the configuration information registered in /etc/hfcldd.conf. The configuration information which the driver currently recognizes and is running can be checked by displaying it with "4.5 Display Current Component".

(3) Please set the Persistent Binding setting “enable” to make effective the Persistent Binding function. The following table shows the relation between the settings and the effectiveness of Persistent Binding function.

Table effectiveness of Persistent Binding function

No.	Persistent Binding setting	AutoMap setting	the effectiveness of Persistent Binding function
1	Enable	off	effective
2		on	ineffective
3	Disable	off	
4		on	

Display port attributes [Windows only]

[Function] Display logical function name and Bus/Device/Function information of the adapter port.
[Syntax]
hfcmgr -ls
[Example]

Figure Sample of hfcmgr –ls execution

```
C:\Program Files\Hitachi\drivers\hba\HFCTools>hfcmgr -ls
--- Device symbolic name           : scsi5
    PCI Vendor id/Device id        : 1054/300b
    EC level                       : A
    PCI Bus/Device/Function number : 18/4/0
    Parts Number                   : 3HAC82101-A
    Model Name                     : HFC0402-E
    Driver version                 : 1.0.5.530
    Firmware version               : 00260809
    World wide port name           : 5000087000572574
    World wide node name           : 5000087000572575
    Connection type                : -
    Link speed                     : -
-------- end of list --------
```

[Detailed description]

Table Detailed description of hfcmgr –ls

No.	Item of display	Description
1	Device symbolic name	Logical device name
2	PCI Vendor id/Device id	Vendor ID/Device ID
3	EC level	Board revision For the board revision, refer to ‘Hitachi Gigabit Fibre Channel Adapter user’s guide’ for details.
4	PCI Bus/Device/Function number	Bus/Device/Function number of PCI device.
5	Parts Number	Parts number
6	Model Name	Model name *1
7	Driver version	Driver version
8	Firmware version	Firmware version
9	Worldwide port name	WWPN
10	Worldwide node name	WWNN
11	Connection type	Protocol between adapter and its connected device. When connection is in LinkDown state, `-‘ is displayed.
12	Link speed	Link speed between adapter and its connected device. When connection is in LinkDown state, `-‘ is displayed

*1) If you use embedded FC-switch in Hitachi Compute Blade 320 and Hitachi Compute Blade 2000, ‘Unknown model’ may be displayed with Model name filed.

Isolate or Recover adapter port.

[Function] Isolate or recover adapter port when replace SFP transceiver while system is running. Refer to Hitachi Compute Blade system user's guide' for how to replace SFP.

Some models of Hitachi Gigabit Fibre Channel Adapter products may not support SFP hot-swap feature. Refer to 'HITACHI Gigabit Fibre Channel User's Guide (Support Matrix Edition) for detail.

[Syntax]

<Display>
hfcmgr –sfp
<Isolate>
hfcmgr –sfp <logical-device-name> <options>
<Recover>
hfcmgr –sfp <logical-device-name> clear <options>
<options>
force # Omit the (y/n) confirmation message at time of delete

[Example 1]

Figure Sample of executing hfcmgr –sfp command

```
#./hfcmgr -sfp
Device:hfcldd0    WWPN:5000087000572640    Status:LinkUp
    SFP Part Number   : FTLF8524P2BNV-HD
        Serial Number : PF43KR7
        Date Code     : 090124
        Transceiver Replacement : not replaceable

Device:hfcldd1    WWPN:5000087000572642    Status:LinkUp
    SFP Part Number   : FTLF8524P2BNV-HD
        Serial Number : PES437S
        Date Code     : 090124
        Transceiver Replacement : not replaceable
```

[Detailed description]

Table Detailed description of hfcmgr –sfp

No.	Item of display	Description
1	Device	Logical device name
2	WWPN	World Wide Port Name
3	Status	Port Status LinkUp: Normal state 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-STOP): Adapter is check-stop state.
5	SFP Part Number	SFP Parts Number
6	SFP Serial Number	SFP Serial Number
7	SFP Date Code	SFP Date Code
8	Transceiver Replacement	Not replaceable : SFP is not hot-replaceable Replaceable : SFP is hot-replaceable You can replace SFP only when port status is Isolate(C) or Isolate(CHK-STP).

[Error Messages]

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

```
Device:hfcldd0    WWPN:5000087000572574    Status:LinkDown
    This Firmware version does not support hot swap feature of SFP Transceiver.
```

<Solution>Update firmware of the adapter

(b) SFP is not plugged or SFP is not embedded (Mezzanine card or embedded FC-Switch)

```
Device:hfcldd1    WWPN:5000087000572640    Status:Isolate(SFPDown)
    SFP Part Number   : N/A
        Serial Number : N/A
        Date Code     : N/A
        Transceiver Replacement : not replaceable
```

<Solution> Confirm whether SFP is plugged.

(c) SFP information is not displayed correctly.

```
Device:hfcldd2    WWPN:5000087000572642    Status:Isolate(SFPFail)
    SFP Part Number   : incorrect data(xxxxxxxx)
        Serial Number : incorrect data
        Date Code     : incorrect data
        Transceiver Replacement : not replaceable
```

<Solution> SFP may be damaged. Replace SFP transceiver.

[Example 2]
Before you replace SFP transceiver, execute isolate command. If command succeed, port status will change to Isolate(C) and Transceiver replacement to replaceable. This means you can hot-replace SFP transceiver.

Figure Sample of executing hfcmgr –sfp command (Isolate)

```
#./hfcmgr -sfp hfcldd1
Do you execute it? (y/n) > y

Succeeded.
#./hfcmgr -sfp
Device:hfcldd1    WWPN:5000087000572642    Status:Isolate(C)
    SFP Part Number   : FTLF8524P2BNV-HD
        Serial Number : PES437S
        Date Code     : 090124
        Transceiver Replacement : replaceable
>
```

[Example 3]
After you replace SFP transceiver, execute recover command. If command succeed, port status will change from Isolate(C) to Linkdown or Linkup. This means now you can connect the adapter port through replaced SFP transceiver.

Figure Sample of executing hfcmgr –sfp command (recover)

```
#./hfcmgr -sfp hfcldd1 clear
Do you execute it? (y/n) > y

Succeeded.
#./hfcmgr -sfp
Device:hfcldd1    WWPN:5000087000572642    Status:LinkUp
    SFP Part Number   : FTLF8524P2BNV-HD
        Serial Number : PES437S
        Date Code     : 090124
        Transceiver Replacement : not replaceable
>
```

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 (Windows driver Edition)’ or ‘Hitachi Gigabit Fibre Channel Adapter User’s Guide (Linux/VMware driver Edition)’.

[Syntax]

<Check online update is applicable>
hfcmgr –u

<Online update>
hfcmgr –u {<Device>|all} [force]

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

[Example]

```
# ./hfcmgr -u
Device   BUS:DEV.FUNC  Flash    Current     Status(Flash -> Current)
hfcldd0  01:01.00      220750    220740      Applicable
hfcldd1  02:01.00      220750    220740      Applicable
hfcldd2  03:01.00      120700    120700      NG (Unsupported)
hfcldd3  04:01.00      120700    120700      NG (Inapplicable - FW)
hfcldd4  05:01.00      220710    220500      NG (Inapplicable - HW)
hfcldd5  06:01.00      220700    220500      Applicable

# ./hfcmgr -u all
DEVICE : hfcldd0
FLASH   SYSREV:00220750
CURRENT SYSREV:00220740

FLASH-> CURRENT Update is OK? (Y/N) : y

Update command finished (hfcldd0). please check the F/W update status.

DEVICE : hfcldd1
FLASH   SYSREV:00220750
CURRENT SYSREV:00220740

FLASH-> CURRENT Update is OK? (Y/N) : y

Update command finished (hfcldd1). please check the F/W update status.
```

The detail of the ‘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 is running now. You are now waiting to complete the operation. If the hfcmgr command version lower than 8.0 is used, or an Adapter except 16G Adapter is used, this message will be displayed.
Waiting(w---)	Firmware update operation is running now and waiting for its completion. If the hfcmgr command version higher than or equal to 8.0 and the 16G Adapter are used, this message will be displayed.
NG(Unsupported)	The firmware does not support firmware online update function. You have to transfer the FLASH-ROM data by off-line.
NG(Inapplicable - FW)	Specified 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(ioctl error) *1)	Error occurred when executing ioctl.
NG(flash read error) *1)	Error occurred when reading FLASH-ROM.
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.
NG(Device Busy) *1)	Failed to open device file.

*1) Retry the command to recover the possible temporary error.

For error messages when executing command, refer to [Error message] in the section ‘hfcmcref-Online update of the firmware’.

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 Windows 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, which OS is provided. (For example, a disk scan is performed from the device manager of Windows.)

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]

hfcmgr –scan { all | <Device> }

[Examples] The following examples include when specifying the hfcldd or all ports in this command.

```
# ./hfcmgr -scan all
hfcldd0: success target scan start.
hfcldd1: skip linkdown port.
hfcldd2: only fc-switch environment is supported.
hfcldd3: adapter port busy, please try again.
hfcldd4: error[xx].

# ./hfcmgr -scan hfcldd0
hfcldd0: success target scan start.
#
```

If the driver fails to initiate scan process for any of the ports in the system, the message ‘Failed’ is displayed. In addition, the detailed message shows the reason why the scan process failed in the port.

No.	messages	meaning
1	success target scan start.	operation is succeeded.
2	skip linkdown port.	Skip initiating scan process because the port is in Linkdown state.
3	only fc-switch environment is supported.	The port connection in your system is not covered in this command.
4	adapter port busy, please try again.	The driver is busy executing other process. Please retry later .
5	error[xx].	An error occurred. Please retry later.

Performance Monitor

This function is available in hfcmgr version higher than or equal to 8.0, in Windows/Linux environments. hfcmgr version can be checked by executing a command, “hfcmgr -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 distribution, processing times to send/receive I/Os. This command displays statistical information for each port, but a core id number can be specified to display and statistical information of each core can be indicated.

[Syntax]

<Display I/O Total Counts>
hfcmgr -pm <logical-device-name> count [core] [vport { <vport number>|all}]
<Display I/O Size Distribution >
hfcmgr -pm <logical-device-name> io [core] [vport { <vport number>|all }]
<Display I/O Processing Time>
hfcmgr -pm <logical-device-name> latency [core] [vport { <vport number>|all }
<Reset Performance Counters>
hfcmgr -pm <logical-device-name> io clear

core: Display statistical information for each core.
vport <vport no> : Display statistical information for each virtual fibre channel port. For identify the id number of virtual fibre channel port, refer to “Display General Information ". A vport number can be specified as shown below.

```
# ./hfcmgr -pm hfcldd0 count vport 1
Time:2013/10/19 00:25:33
------------------------------------------------------------
 WWPN:50000870005b4092  Device:hfcldd0   [LinkUp]
------------------------------------------------------------
vport    Entry
vport1   WRCnt         0
vport1   RDCnt         208
         :
```

When “vport all” is specified as command-line parameter, hfcmgr displays information of “vport 0” and all configured vports. The information displayed as “vport 0” corresponds to the result without the command-line parameter “vport”, or the information of the physical Fibre Channel port that contains the vport.

[Example 1] Display I/O total counts, without specifying core.

```
# ./hfcmgr -pm hfcldd0 count
Time:2013/10/19 00:25:33
------------------------------------------------------------
 WWPN:50000870005b4092  Device:hfcldd0   [LinkUp]
------------------------------------------------------------
Entry
WRCnt          0
RDCnt          208
WR-Data        0
RD-Data        743796
Int            208
Cmnd/Int       1
Cmnd/IntAvg    1.00
BusyResp       0
HBABusy        0
TXQBusy        0
SGLBusy        0
DMABusy        0
IOEr           0
loSyn          1
loSig          0
NOS            0
LinkEr         1
CRCEr          0
```

[Example 2] Display I/O total counts, with specifying core.

```
# ./hfcmgr -pm hfcldd0 count core
Time:2013/10/19 00:27:15
------------------------------------------------------------
 WWPN:50000870005b4092  Device:hfcldd0   [LinkUp]
------------------------------------------------------------
Entry         core1               core3
WRCnt         0                   0
RDCnt         104                 104
WR-Data       0                   0
RD-Data       374000              369796
Int           104                 104
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
loSyn         -                   -
loSig         -                   -
NOS           -                   -
LinkEr        -                   -
CRCEr         0                   0
```

[Detailed information about each entries in I/O Total Counts Display]

Display entry	Description
Device	Logical Device Name
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 the entries are shown as "－" when a core number is specified to hfcmgr command.

loSyn, loSig, NOS, LinkEr

(2) When a vport is specified to hfcmgr command, the information of the entries shown below will displays each physical ports' information.

loSyn, loSig, NOS, LinkEr, CRCEr

[Example 3] Display I/O Size Distribution, without specifying core.

```
# ./hfcmgr -pm hfcldd0 io
Time:2013/10/19 00:28:34
------------------------------------------------------------
 WWPN:50000870005b4092  Device:hfcldd0   [LinkUp]
------------------------------------------------------------
Entry
RD-512B       54
RD-2KB        2
RD-4KB        0
RD-16KB       526928
RD-32KB       12537
RD-Over       18115
WR-512B       0
WR-2KB        0
WR-4KB        0
WR-16KB       519934
WR-32KB       361371
WR-Over       9847
```

[Example 4] Display I/O Size distribution, with specifying core.

```
# ./hfcmgr -pm hfcldd0 io core
Time:2013/10/19 00:29:10
------------------------------------------------------------
 WWPN:50000870005b4092  Device:hfcldd0   [LinkUp]
------------------------------------------------------------
Entry         core0               core2
RD-512B       28                  26
RD-2KB        1                   1
RD-4KB        0                   0
RD-16KB       296567              297303
RD-32KB       9299                9175
RD-Over       13159               13172
WR-512B       0                   0
WR-2KB        0                   0
WR-4KB        0                   0
WR-16KB       276496              277666
WR-32KB       208705              206692
WR-Over       4919                4928
```

[Detailed information about each entries in I/O Distribution Display]

Display entry	Description
Device	Logical Device Name
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 5] Display I/O Processing Time, without specifying core.

```
# ./hfcmgr -pm hfcldd0 latency
Time:2013/10/19 00:30:24
------------------------------------------------------------
 WWPN:50000870005b4092  Device:hfcldd0   [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: 2933633493 Hz
RspMax RD-Cmd: OpeCode[0x28] I/O Size[159744]
RspMax WR-Cmd: OpeCode[0x2a] I/O Size[20480]
```

[Example 6] Display I/O Processing Time, with specifying core.

```
# ./hfcmgr -pm hfcldd0 latency
Time:2013/11/21 05:00:05
------------------------------------------------------------
 WWPN:50000870005b4092  Device:hfcldd0   [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: 2933986744 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 recentry 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.

[Detailed information about each entries in I/O Processing Time]

Display entry	Description
Device	Logical Device Name
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 General Information” beforehand.

Virtual Fibre Channel Activation

This function is available on 16G Fibre Channel Adapters with hfcmgr version higher than or equal to 8.0, in Windows/Linux environments.

[Function] This command can activate Virtual Fibre Channel Feature with Windows Server 2012, Server 2012 R2 Hyper-V and RHEL KVM environment without rebooting the system. For details, refer to the section “Virtual fibre channel feature in Windows Server 2012 and 2012 R2 with Hyper-V roll installed” in “Hitachi Gigabit Fibre Channel Adapter User’s guide (Windows driver Edition)” or the section “RHEL6 and RHEL7KVM Virtual Fibre Channel” in “HITACHI Gigabit Fibre Channel Adapter USER’S GUIDE (Linux/VMware driver Edition)”.

[Syntax]

<Re-initialize Active Link>
hfcmgr -reset <logical-device-name> [force]

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

[Example]

```
# ./hfcmgr -reset hfcldd0
Time:2013/11/21 06:16:11
-------------------------------------------------------------
 WWPN:50000870005b4092  Device:hfcldd0   [LinkUp]
-------------------------------------------------------------

Link setting refers to the following.
Connection Type         : Point to Point
Multiple PortID         : disable
Link Speed              : Auto
NPIV                    : enable

Do you execute Applying Link setting to the driver? (y/n) > y


Succeeded.
#
```

Display parameter configurations. Re-initialize the active link using the parameters. If it is OK, press “y” and execute it.

[Detailed information about the parameters related to Virtual Fibre Channel Activation]

Display entry	Descriptions
Connection Type	Configuration of Connection Type
Multiple PortID	Configuration of Multiple PortID
Link Speed	Configuration of LinkSpeed
NPIV	Display the configuration of NPIV. If this parameter is not set anything, this command displays the symbol “-” as the configured parameter value. If this command is executed in such situation, it disables NPIV.

Display version information of the utility software

[Function] Display version information

[Syntax]
hfcmgr –v

[Examples]

```
#./hfcmgr -v
------------------------------------------------------------
 Hitachi HBA Utility
 API    Version 03-00
 hfcmgr Version 2.2 (cli:1.1.2.2.2.5.4.2 api:1.1.2.2.2.5.4.1 cmn:1.1.2.2.2.6.4.3)
 Copyright (c) 2007,2009, Hitachi Ltd.
------------------------------------------------------------
```

Display help information

[Function] Display help information

[Syntax]
hfcmgr –h

[Examples]

```
#./hfcmgr -h
------------------------------------------------
 Please select number you want to refer help.
------------------------------------------------
 1  : General Information
 2  : Port Information
 3  : Boot Information
 4  : Firm Backup/Update Execution
 5  : Bios Backup
 6  : Bios Restore
 7  : Show Device List
 8  : Modify Port Setting Data
 9  : Display Statistics
 10 : Online Update
 11 : SFP Information
 12 : Display Device Information

 13 : All Commands

Enter Number > 2
------------------------------------------------------
hfcmgr <commands> [<options>]
       ex. hfcmgr -p <Device>

common parameters
   <Device> : Specify Each HBA Port.
   all      : Specify common setting of All HBA Port.
   delete   : Delete operation.
------------------------------------------------------

.........
```

hfcmgr response messages

The table below displays the result code of hfcmgr command and response messages.
If hfcmgr is used on Windows, check the version combination of the utility and the driver are supported. If they are used in unsupported combination, hfcmgr command does not work properly and appropriate message may not be displayed. Refer to 'Windows driver and its utility software version' table in Hitachi Gigabit Fibre Channel Adapter User's Guide (Support Matrix Edition) for supported combinations.

List of the hfcmgr command response messages

No.	Response message	Description	Terminating code
1	Success.	Successfully terminated	0
2	No such <Device>.	No assigned logical device name existing Check the logical device name.	1
3	Invalid parameter value.	Illegal assigned parameter value Check the parameter value.	2
4	Command syntax error. (command help -h option)	Command syntax error Check the syntax.	3
5	Input data is not numeral.	Other than the numerical value assigned in the numerical value assigning field Check the syntax.	4
6	Input data is out of range.	Assigned parameter value outside the range Check the range of the parameter value assigned.	5
7	Input wwn is illegal.	Illegal WWN assigned Check the number of digits and numerical value of WWN.	6
8	Input option is not support operation. (delete, {all|<Device>})	Assigned option unsupported With the assigning option, Assign Delete, Assign All and Assign the Logical Device Name are not supported. Check with this guide	7
9	Unused	-	8
10	Input option is not support operation. (<Device>). [Windows]	Assigned option is not applicable in single port settings. Specify 'all' to apply parameters to all HBA adapters.	8
11	Unused	-	9
12	Other error.	Another error occurred.	【Windows】9 【Linux】10
13	No such directory.	No assigned directory existing Check if the directory exists.	【Windows】10 【Linux】11

14	No such file.	No assigned file existing Check if the file exists.	【Windows】11 【Linux】12
15	Not support, LPAR mode is shared.	Not supported on the LPAR mode (shared)	【Windows】12 【Linux】13
16	Not support, LPAR mode.	Not supported on the LPAR mode	【Windows】13 【Linux】14
17	Unused	-	15
18	Not support, E-Option is disable.	Not supported. E-option is not available.	16
19	Input WWPN not configured in hfcldd.conf.	The input WWPN is not defined in /etc/hfcldd.conf. Since the port individual setting is not defined for the assigned WWPN, this command is not necessary.	【Windows】14 【Linux】17
20	Nothing WWPN configured in hfcldd.conf.	None of WWPN is defined in /etc/hfcldd.conf. Since none of the port individual setting is defined, this command is not necessary.	【Windows】15 【Linux】18
21	WWPN is not found at HBAAPI.	WWPN is not existed in HBAAPI. Wait for a while and retry	【Windows】16 【Linux】19
22	No such <WWPN>.	No assigned WWPN adapter existing Check WWPN of the adapter.	【Windows】17 【Linux】20
23	The adapter port has already isolated.	The adapter port is already isolated. Check port status using hfcmgr -sfp	【Windows】28 【Linux】21
24	No Adapter port.	No adapter port existing Check if the adapter is correctly set.	【Windows】18 【Linux】22
25	Access busy, please try again later.	The hfcmgr function already in operation. Re-execute after a while.	【Windows】19 【Linux】23
26	Please input full path.	Assign the absolute path.	24
27	Input WWPN is already configured in hfcldd.conf 【Linux】 Input WWPN is already configured in registry. 【Windows】	Since the value assigned for the new WWPN is already used for the other adapter port, no change is available. Check the new WWPN.	【Windows】21 【Linux】25
28	Unused	-	26
29	File is not opened.	Failed to open file. Retry the command again.	27
30	File format illegal.	File format is invalid.	28
31	Unused	-	29
32	Unused	-	30
33	Application lock error. 【Windows】	Failed to lock driver resources. Wait for a while and retry.	26
34	This Firmware version does not support hot swap feature of SFP Transceiver.	Firmware does not support SFP hot-swap. Update HBA firmware to the latest version.	【Windows】27 【Linux】38
35	The adapter port status is CHECK-STOP.	Specified adapter port is Check-Stop state. Check port status.	【Windows】29 【Linux】31
36	Check adapter mode is error. 【Windows】	Specified adapter port is not the status which is available in SFP hot-swap. Check adapter status using hfcmgr –sfp	30
37	The adapter port does not awake isolation mode. 【Windows】	Failed to recover SFP. Wait for a while and retry	31
38	Unused	-	32
39	Input option is not support operation.(<Device>)	Specified option is not supported. Specified option is not applicable in single port settings.	33
40	Unused	-	34

41	Unused	-	35
42	Unused	-	36
43	Unused	-	37
44	Unused	-	33, 39
45	HFCAPI system error.	An API system error occurred.	51
46	HFCAPI argument error.	An API parameter error occurred.	52
47	HFCAPI invalid WWPN.	An API illegal WWPN error occurred.	54
48	HFCAPI lock timeout.	An API lock timeout occurred. Re-execute after a while.	55
49	HFCAPI invalid HBA.	API illegal HBA assigned	56
50	HFCAPI ioctl retry.	API ioctl error occurred. Re-execute after a while.	57
51	HFCAPI device busy.	API busy Re-execute after a while.	58
52	HFCAPI wrong file format.	API illegal file format Check if the correct file is assigned.	59
53	HFCAPI internal error.	The other API error occurred.	60
54	HFCAPI related application(bios) terminated.	API related application (bios) abnormally terminated. Check the hfcbios.log.	61
55	HFCAPI related application (mcup) terminated.	API related application (mcup) abnormally terminated. Check the hfcmcup.log.	63
56	Unused	-	64
57	Please clear the HBA Parameters (ConnectionType, LinkSpeed) with the following commands. "hfcmig -clear"【Windows】	HBA parameters (ConnectionType, LinkSpeed) are set by old format. Delete parameters executing hfcmig–clear command.	65
58	HFCAPI unsupported.	API is not supported	70
59	Unused	-	80
60	Unused	-	81
61	Unused	-	82
62	Unused	-	83
63	Unused	-	84
64	Unused	-	85
65	Unused	-	86
66	Unused	-	87
67	Unused	-	88
68	HBAAPI error.	HBAAPI error occurred. Wait for a while and retry	101
69	HBAAPI function not supported.		102
70	HBAAPI invalid handle.		103
71	HBAAPI bad argument.		104
72	HBAAPI name_identifier not recognized.		105
73	HBAAPI index not recognized.		106
74	HBAAPI larger buffer required.		107
75	HBAAPI stale data.		108
76	HBAAPI SCSI check condition reported.		109
77	HBAAPI HBA busy or reserved, retry may be effective.		110
78	HBAAPI referenced HBA has been removed or deactivated.		112
79	HBAAPI A SCSI command was requested to an end port that was not a SCSI target port.		127
80	HBAAPI A SCSI function was rejected to prevent causing a SCSI overlapped command condition.		130

81	Unused	-	32, 71
82	Unused	-	34, 72
83	The Non NPIV FC port of direct link to target should set up FC-AL, not Auto negotiation.	If virtual fibre channel ports on Windows Server 2012 or Windows Server 2012 R2 Hyper-V environment are directly connected to a disk device, the connection type of the adapter port should be set to “FC-AL”, not “Auto”.	【Windows】36 【Linux】40
84	The adapter port status is SFPFail.	Failed because of the specified port is SFP Fail status. Check status of the port.	42
85	The adapter port status is SFPNotSupport.	Failed because of the specified port is SFP Not Support status. Check status of the port.	43
86	The adapter port status is SFPDown.	Failed because of the specified port is SFP Down status. Check status of the port.	44
87	No such <vport>.	Specified Virtual Fibre Channel Port does not exist. Check the port number to specify.	45
88	The driver failed to apply the value immediately. Please try again later, or reboot your host.	Failed to enable Virtual Fibre Channel Function. 1. If a Virtual Fibre Channel Function is already enabled, this command is not necessary. 2. If Virtual Fibre Channel Function does not work, re-execute this command after a while.	92

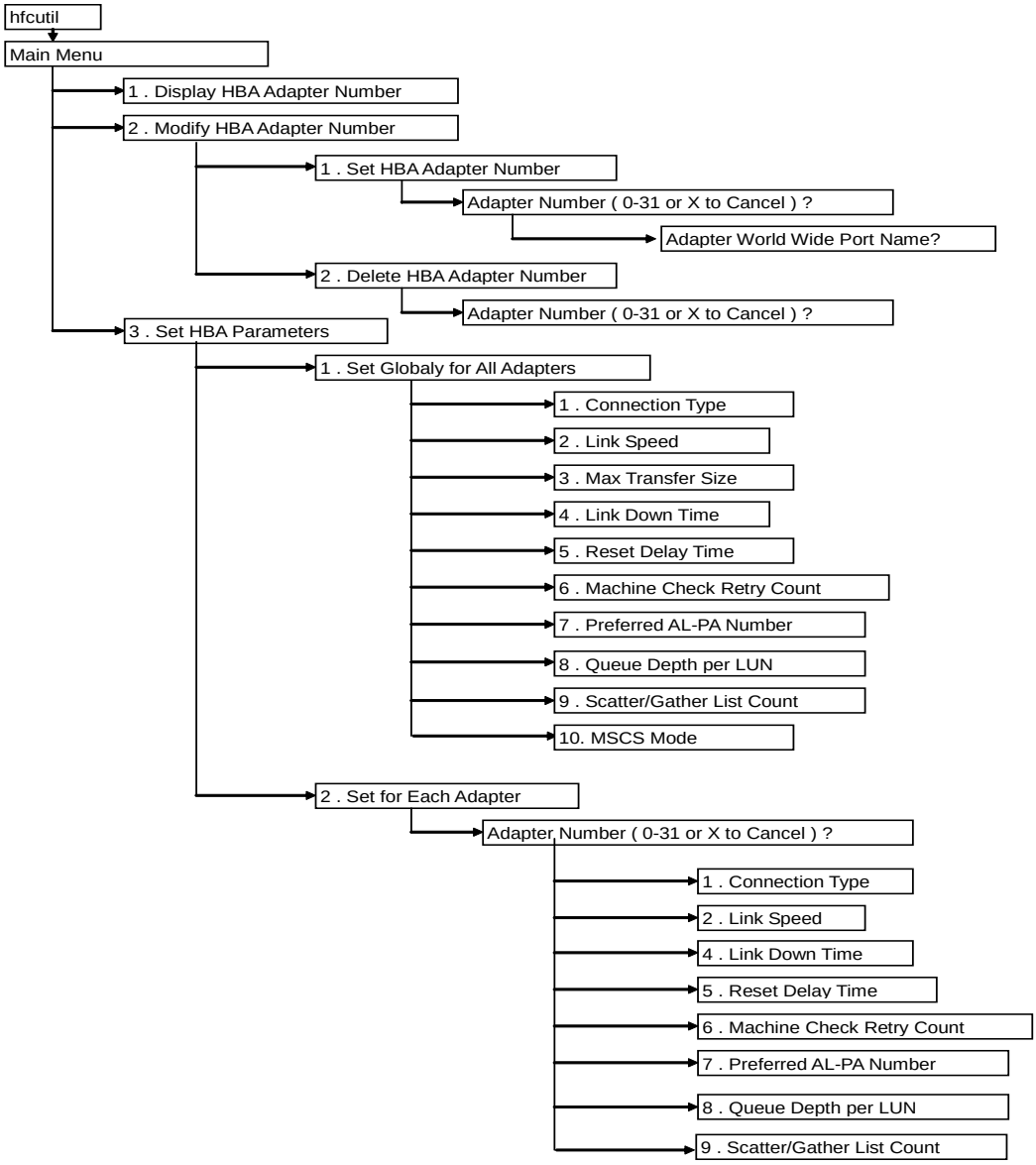
5

hfcutil

hfcutil (Windows)

Command Tree Structure of hfcutil

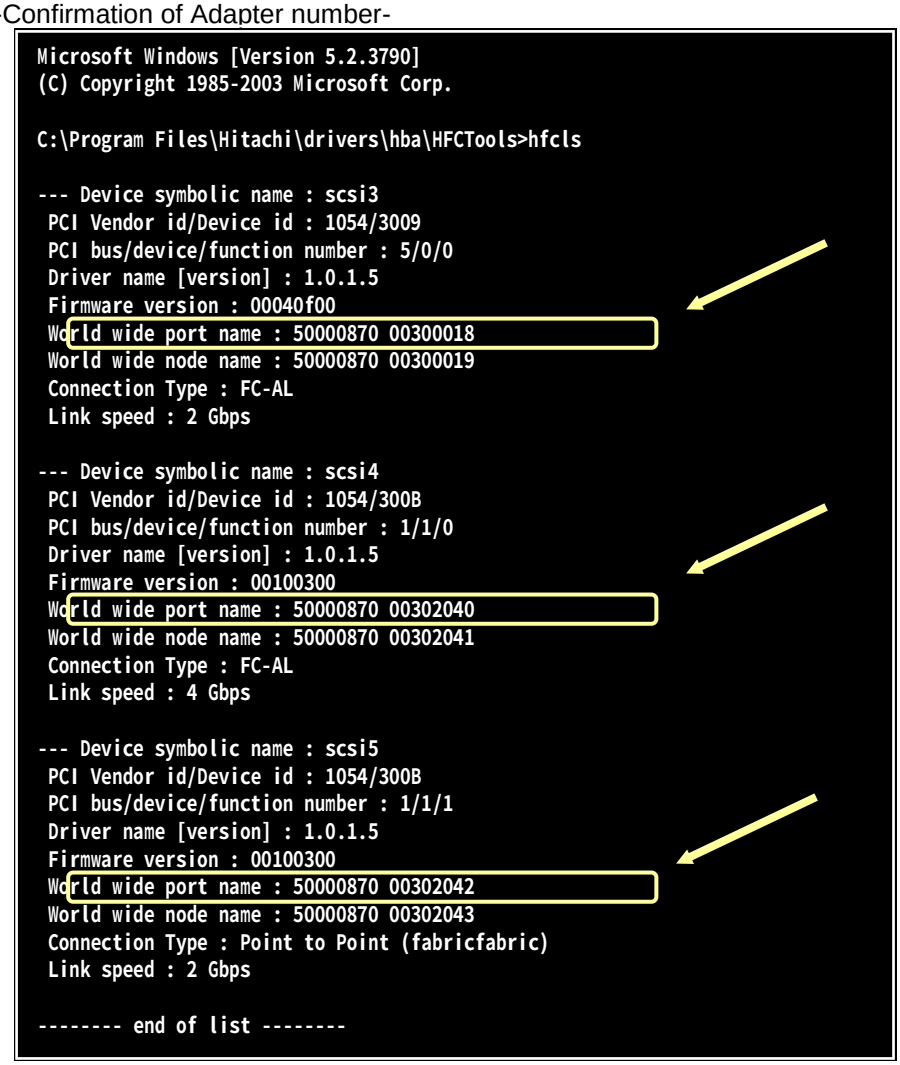
Various parameters for the Adapter can be set by the hfcutil command.
The following figure shows the command tree structure of hfcutil.



Confirm the Adapter number

A number is allocated to the installed each Adapter by using World Wide Port Name allocated in the port of the Adapter when an individual parameter is set to each Adapter.

-Confirmation of Adapter number-

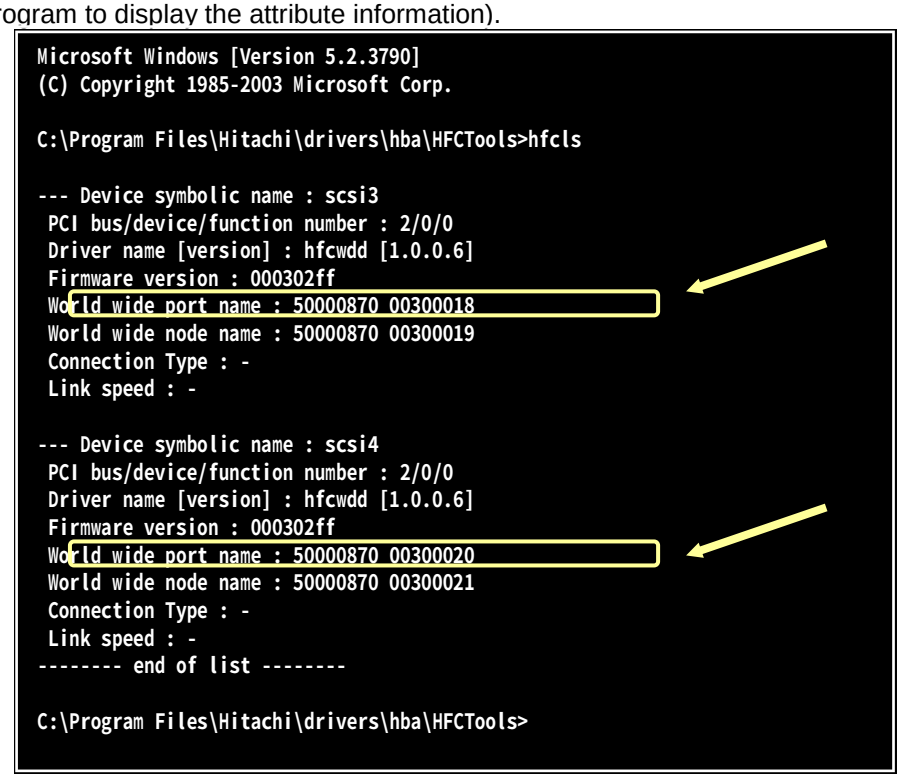


Allocate the Adapter number

When various parameters are set for each Adapter individually, it is necessary to allocate the Adapter number to the installed each Adapter beforehand. This setting is registered to the registry and it is not necessary to re-input the parameters after that.

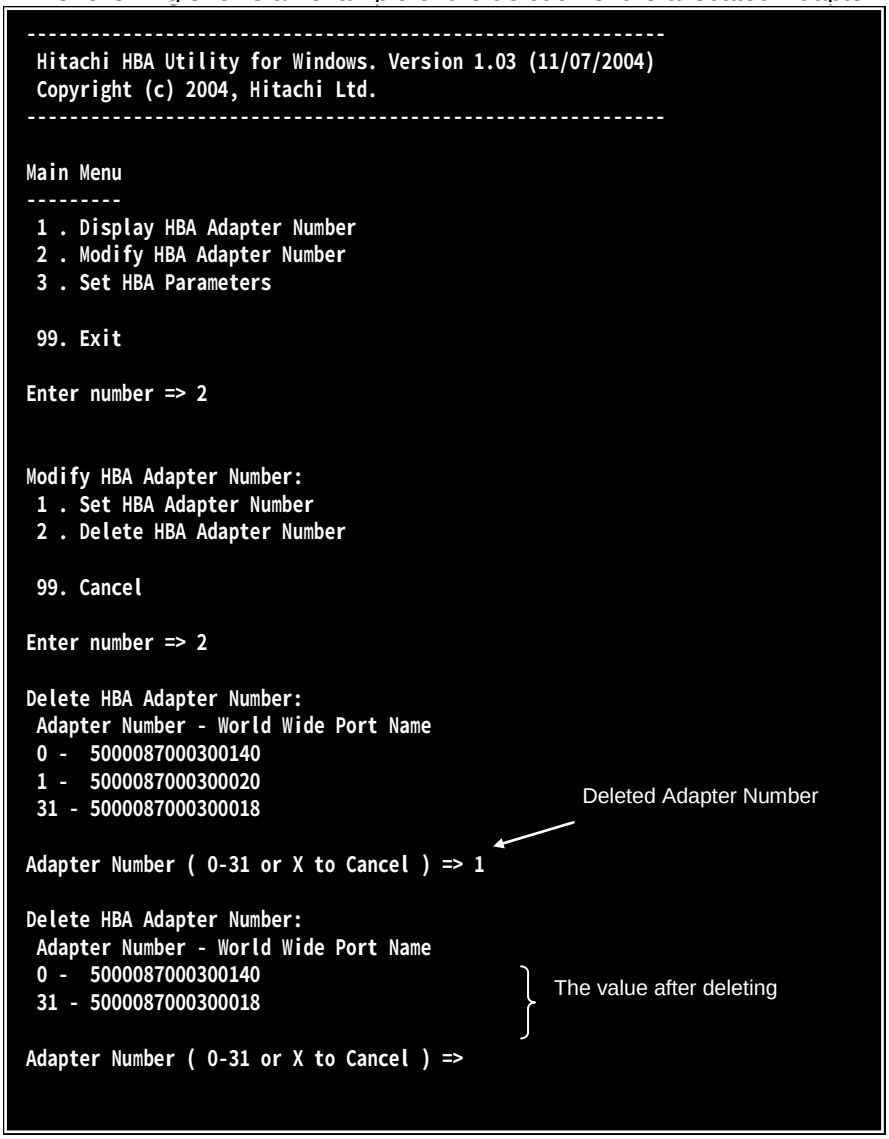
-Setting example-
Adapter number 0 is allocated to the Adapter whose World Wide Port Name is 50000870 00300140.

Please acquire World Wide Port Name of the installed Adapter by using "hfcls" (Program to display the attribute information).



Delete the Adapter number

The following shows an example of the deletion of the allocated Adapter number.




```
------------------------------------------------------------
 Hitachi HBA Utility for Windows. Version 1.03 (11/07/2004)
 Copyright (c) 2004, Hitachi Ltd.
------------------------------------------------------------

Main Menu
---------
 1 . Display HBA Adapter Number
 2 . Modify HBA Adapter Number
 3 . Set HBA Parameters

 99. Exit

Enter number => 2


Modify HBA Adapter Number:
 1 . Set HBA Adapter Number
 2 . Delete HBA Adapter Number

 99. Cancel

Enter number => 2

Delete HBA Adapter Number:
 Adapter Number - World Wide Port Name
 0 -  5000087000300140
 1 -  5000087000300020
 31 - 5000087000300018

Adapter Number ( 0-31 or X to Cancel ) => 1

Delete HBA Adapter Number:
 Adapter Number - World Wide Port Name
 0 -  5000087000300140
 31 - 5000087000300018

Adapter Number ( 0-31 or X to Cancel ) =>
```

Driver parameters

Available range for each parameter is deferent depending on the type of Hitachi Gigabit Fibre Channel Adapters. Refer to section ‘Driver parameters’ for details.

hfcddutil on Linux

hfcddutil has two modes, Menu mode and CLI mode.

Available range for each parameter is deferent depending on the type of Hitachi Gigabit Fibre Channel Adapters. Refer to section ‘Driver parameters’ for details.

[MENU mode]
  You can execute various operations from the main screen sequentially.

[CLI mode]
  Execute one operation by one command. Shell script or batch file uses each command.

  If the same settings exist both on /etc/modules.conf (RHEL3) or /etc/modprobe.conf (RHEL4 and RHEL5) and /etc/hfcldd.conf, the utility software identifies settings on /etc/hfcldd.conf and ignore the other settings.

Menu mode

q Initiate Menu mode

You can initiate menu mode by executing the following command.

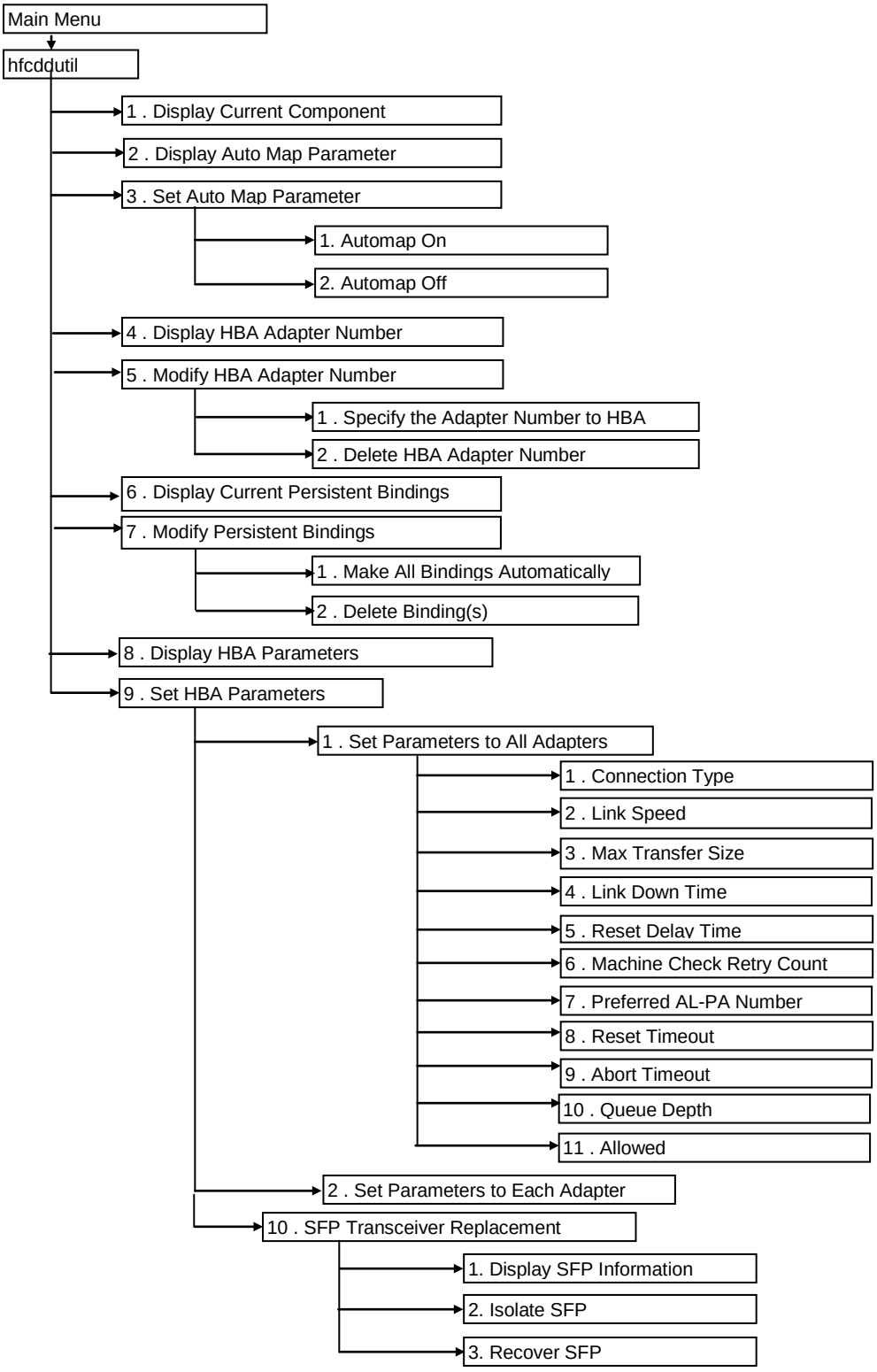
```
# hfcddutil
```

[Execution example]

```
C:\Program Files\Hitachi\drivers\hba\HFCTools>hfcmgr -h
-------------------------------------------------
 Please select number you want to refer help.
-------------------------------------------------
 1  : General Information
 2  : Port Information
 3  : Boot Information
 4  : Firm Backup/Update Execution
 5  : Bios Backup
 6  : Bios Restore
 7  : Show Device List
 8  : Modify Port Setting Data
 9  : Display Statistics
 10 : Online Update
 11 : SFP Information
 12 : Display Device Information

 13 : All Commands

Enter Number > 2
-----------------------------------------------------
hfcmgr <commands> [<options>]
       ex. hfcmgr -p <Device>

common parameters
   <Device> : Specify Each HBA Port.
   all      : Specify common setting of All HBA Port.
   delete   : Delete operation.
-----------------------------------------------------

……
```

q Command tree structure of hfcddutil

Various parameters and Persistent Binding function of the Adapter can be set by hfcddutil commands. The following figure shows the command tree structure of hfcddutil.



q Confirm the adapter number

You can allocate the specific number for each adapter port. This number stored together with adapter port's unique World Wide Port Name.
You can confirm World Wide Port Name of the installed adapters by hfcddutil command, "Display Current Component".

```
------------------------------------------------------------
 Hitachi HBA Utility for Linux. Version 2.0.1.20 (3/17/2006)
 Copyright (c) 2004-2006, Hitachi Ltd.
------------------------------------------------------------

Main Menu
---------
 1 . Display Current Component
 2 . Display Auto Map Parameter
 3 . Set Auto Map Parameter
 4 . Display HBA Adapter Number
 5 . Modify  HBA Adapter Number
 6 . Display Current Persistent Bindings
 7 . Modify  Persistent Bindings
 8 . Display HBA Parameters
 9 . Set HBA Parameters

 99. Exit

Enter number => 1

<Display Current Component>
  Adapter: 00,  WWPN: 5000087000300130
  Adapter: 00,  Target: 000,  WWPN: 50060e8000427810
  Adapter: 00,  Target: 000,  WWNN: 50060e8000427810
  Adapter: 00,  Target: 001,  WWPN: 50060e8000427811
  Adapter: 00,  Target: 001,  WWNN: 50060e8000427811
  Adapter: 01,  WWPN: 5000087000300020
  Adapter: 01,  Target: 000,  WWPN: 50060e8000427810
  Adapter: 01,  Target: 000,  WWNN: 50060e8000427810
  Adapter: 01,  Target: 001,  WWPN: 50060e8000427811
  Adapter: 01,  Target: 001,  WWNN: 50060e8000427811

Return to Main Menu =>
```

q Allocate the adapter number

You have to allocate the adapter number beforehand when setting driver parameters or using Persistent Binding feature. This setting is registered in /etc/modules.conf.

[Example]
An adapter number 0 is allocated to the adapter port whose World Wide Port Name is 50000870 00300130.

```
------------------------------------------------------------
 Hitachi HBA Utility for Linux. Version 2.0.1.20 (3/17/2006)
 Copyright (c) 2004-2006, Hitachi Ltd.
------------------------------------------------------------

Main Menu
---------
 1 . Display Current Component
 2 . Display Auto Map Parameter
 3 . Set Auto Map Parameter
 4 . Display HBA Adapter Number
 5 . Modify  HBA Adapter Number
 6 . Display Current Persistent Bindings
 7 . Modify  Persistent Bindings
 8 . Display HBA Parameters
 9 . Set HBA Parameters

 99. Exit

Enter number => 5

Modify HBA Adapter Number:
 1 . Specify the Adapter Number to HBA
 2 . Delete  HBA Adapter Number

 99. Cancel

Enter number => 1

<Display Current Component>
  Adapter: 00,  WWPN: 5000087000300130
  Adapter: 00,  Target: 000,  WWPN: 50060e8000427810
  Adapter: 00,  Target: 000,  WWNN: 50060e8000427810
  Adapter: 00,  Target: 001,  WWPN: 50060e8000427811
  Adapter: 00,  Target: 001,  WWNN: 50060e8000427811
  Adapter: 01,  WWPN: 5000087000300020
  Adapter: 01,  Target: 000,  WWPN: 50060e8000427810
  Adapter: 01,  Target: 000,  WWNN: 50060e8000427810
  Adapter: 01,  Target: 001,  WWPN: 50060e8000427811
  Adapter: 01,  Target: 001,  WWNN: 50060e8000427811

Adapter Number ( 0-63, X to Cancel ) => 0

Adapter World Wide Port Name (exp. 500008a00030114e) => 5000087000300130

Adapter Number - World Wide Port Name (in /etc/hfcldd.conf):
 00            - 5000087000300130

Adapter Number ( 0-63, X to Cancel ) =>
```

q Delete the adapter number

The following shows an example of the deletion of the allocated adapter number.

```
------------------------------------------------------------
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------------------------------------------------------------

Main Menu
---------
 1 . Display Current Component
 2 . Display Auto Map Parameter
 3 . Set Auto Map Parameter
 4 . Display HBA Adapter Number
 5 . Modify  HBA Adapter Number
 6 . Display Current Persistent Bindings
 7 . Modify  Persistent Bindings
 8 . Display HBA Parameters
 9 . Set HBA Parameters

 99. Exit

Enter number => 5

Modify HBA Adapter Number:
 1 . Specify the Adapter Number to HBA
 2 . Delete  HBA Adapter Number

 99. Cancel

Enter number => 2

Adapter Number - World Wide Port Name (in /etc/hfcldd.conf):
 00            - 5000087000300130
 01            - 5000087000300020
 02            - 5000087000300140

Adapter Number ( 0-63, X to Cancel ) => 1

Adapter Number - World Wide Port Name (in /etc/hfcldd.conf):
 00            - 5000087000300130
 02            - 5000087000300140

Modify HBA Adapter Number:
 1 . Specify the Adapter Number to HBA
 2 . Delete  HBA Adapter Number

 99. Cancel

Enter number =>
```

q Driver parameters

Available range for each parameter depends on the type of Hitachi Gigabit Fibre Channel Adapters. Refer to section ‘Driver parameters’ for details.

q Set Persistent Binding information

You can make OS identify the fix configuration using persistent binding feature. The parameters for persistent binding information to the current configuration can be automatically created and stored in /etc/hfcldd.conf file using "Modify Persistent Bindings-Make All Bindings Automatically".

```
------------------------------------------------------------
 Hitachi HBA Utility for Linux. Version 2.0.1.20 (3/17/2006)
 Copyright (c) 2004-2006, Hitachi Ltd.
------------------------------------------------------------

Main Menu
---------
 1 . Display Current Component
 2 . Display Auto Map Parameter
 3 . Set Auto Map Parameter
 4 . Display HBA Adapter Number
 5 . Modify  HBA Adapter Number
 6 . Display Current Persistent Bindings
 7 . Modify  Persistent Bindings
 8 . Display HBA Parameters
 9 . Set HBA Parameters

 99. Exit

Enter number => 7

Select Modifying Method:
 1 . Make All Bindings Automatically
 2 . Delete Binding(s)

 99. Cancel

Enter number => 1

Adapter Number - World Wide Port Name (in /etc/hfcldd.conf):
 00            - 5000087000300130
 01            - 5000087000300020

Persistent Bindings (in /etc/hfcldd.conf):
 001.  Adapter: 00,  Target: 000,  WWPN: 50060e8000427810
 002.  Adapter: 00,  Target: 000,  WWNN: 50060e8000427810
 003.  Adapter: 00,  Target: 001,  WWPN: 50060e8000427811
 004.  Adapter: 00,  Target: 001,  WWNN: 50060e8000427811
 005.  Adapter: 01,  Target: 000,  WWPN: 50060e8000427810
 006.  Adapter: 01,  Target: 000,  WWNN: 50060e8000427810
 007.  Adapter: 01,  Target: 001,  WWPN: 50060e8000427811
 008.  Adapter: 01,  Target: 001,  WWNN: 50060e8000427811

Return to Main Menu =>
```

Moreover, you have to set "Set Auto Map Parameter" to make this function effective.
Please note that the persistent binding information set on /etc/hfcldd.conf does not become effective during Automap is enabled.
The value of Automap can be confirmed by "Display Auto Map Parameter".

```
------------------------------------------------------------
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 Copyright (c) 2004-2006, Hitachi Ltd.
------------------------------------------------------------

Main Menu
---------
 1 . Display Current Component
 2 . Display Auto Map Parameter
 3 . Set Auto Map Parameter
 4 . Display HBA Adapter Number
 5 . Modify  HBA Adapter Number
 6 . Display Current Persistent Bindings
 7 . Modify  Persistent Bindings
 8 . Display HBA Parameters
 9 . Set HBA Parameters

 99. Exit

Enter number => 3

Select Automap Method:
 1 . Automap On
 2 . Automap Off

 99. Cancel

Enter number => 2

Auto Map Parameter (in /etc/modprobe.conf):
 hfc_automap=0 (Automap Off)

Return to Main Menu =>
```

q Delete Persistent Binding information

All persistent binding information can be removed specifying “Modify Persistent Bindings -Delete Binding(s)". You have to set Automap on when you remove persistent binding information.

```
------------------------------------------------------------
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------------------------------------------------------------

Main Menu
---------
 1 . Display Current Component
 2 . Display Auto Map Parameter
 3 . Set Auto Map Parameter
 4 . Display HBA Adapter Number
 5 . Modify  HBA Adapter Number
 6 . Display Current Persistent Bindings
 7 . Modify  Persistent Bindings
 8 . Display HBA Parameters
 9 . Set HBA Parameters

 99. Exit

Enter number => 7

Select Modifying Method:
 1 . Make All Bindings Automatically
 2 . Delete Binding(s)

 99. Cancel

Enter number => 2

Delete Binding Menu:
 1 . Delete All Binding

 99. Cancel

Enter number => 1

Persistent Bindings (in /etc/hfcldd.conf):
  None of target bindings are specified in hfcldd.conf.

Select Modifying Method:
 1 . Make All Bindings Automatically
 2 . Delete Binding(s)

 99. Cancel

Enter number =>
```

q Confirm Persistent Binding information

```
------------------------------------------------------------
 Hitachi HBA Utility for Linux. Version 2.0.1.20 (3/17/2006)
 Copyright (c) 2004-2006, Hitachi Ltd.
------------------------------------------------------------

Main Menu
---------
 1 . Display Current Component
 2 . Display Auto Map Parameter
 3 . Set Auto Map Parameter
 4 . Display HBA Adapter Number
 5 . Modify  HBA Adapter Number
 6 . Display Current Persistent Bindings
 7 . Modify  Persistent Bindings
 8 . Display HBA Parameters
 9 . Set HBA Parameters

 99. Exit

Enter number => 6

Persistent Bindings (in /etc/hfcldd.conf):
 001.  Adapter: 00,  Target: 000,  WWPN: 50060e8000427810
 002.  Adapter: 00,  Target: 000,  WWNN: 50060e8000427810
 003.  Adapter: 00,  Target: 001,  WWPN: 50060e8000427811
 004.  Adapter: 00,  Target: 001,  WWNN: 50060e8000427811
 005.  Adapter: 01,  Target: 000,  WWPN: 50060e8000427810
 006.  Adapter: 01,  Target: 000,  WWNN: 50060e8000427810
 007.  Adapter: 01,  Target: 001,  WWPN: 50060e8000427811
 008.  Adapter: 01,  Target: 001,  WWNN: 50060e8000427811

Return to Main Menu =>
```

q Isolate or recover adapter port

Isolate or recover adapter port when replace SFP transceiver while system is running.

Refer to ‘Hitachi Compute Blade system user’s guide’ for how to replace SFP.

Display SFP information

You can confirm SFP information selecting ‘Select SFP Operations’-‘Display SFP Information’.

```
------------------------------------------------------------
 Hitachi HBA Utility for Linux. Version 1.0.2.65 (06/17/2009)
 Copyright (c) 2004-2009, Hitachi Ltd.
------------------------------------------------------------

Main Menu
---------
 1 . Display Current Component
 2 . Display Auto Map Parameter
 3 . Set Auto Map Parameter
 4 . Display HBA Adapter Number
 5 . Modify  HBA Adapter Number
 6 . Display Current Persistent Bindings
 7 . Modify  Persistent Bindings
 8 . Display HBA Parameters
 9 . Set HBA Parameters
 10. SFP Transceiver Replacement

 99. Exit

Enter number => 10

Select SFP Operations:
 1 . Display SFP Information
 2 . Isolate SFP
 3 . Recover SFP

 99. Cancel

Enter number => 1

Device: hfcldd0  WWPN: XXXXXXXXXXXXXXXX    Status: LinkUp
  SFP Part Number   : xxxxxxxxxxxxxxxx
      Serial Number : yyyyyyyyyyyyyyyy
      Date Code     : zzzzzzzz
      Transceiver Replacement : not replaceable

Select SFP Operations:
 1 . Display SFP Information
 2 . Isolate SFP
 3 . Recover SFP

 99. Cancel

Enter number =>
```

【Display items】

No.	Item of display	Description
1	Device	Logical device name
2	WWPN	World Wide Port Name
3	Status	Port Status LinkUp: Normal state 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-STOP): Adapter is check-stop state.
5	SFP Part Number	SFP Parts Number
6	SFP Serial Number	SFP Serial Number
7	SFP Date Code	SFP Date Code
8	Transceiver Replacement	Not replaceable : SFP is not hot-replaceable Replaceable : SFP is hot-replaceable You can replace SFP only when port status is Isolate(C) or Isolate(CHK-STP).

[Error Messages]

■Firmware does not support SFP transceiver hot-swap

<Solution>Update firmware of the adapter.

```
Device: hfcldd0  WWPN: XXXXXXXXXXXXXXXX    Status: LinkUp
  This Firmware version does not support hot swap feature of SFP Transceiver.
```

■SFP is not plugged or SFP is not embedded (Mezzanine card or embedded FC-Switch).

<Solution> Comfirm whether SFP is plugged.

```
Device: hfcldd0  WWPN: XXXXXXXXXXXXXXXX    Status: Isolate(SFPDown)
  SFP Part Number   : N/A
         Serial Number : N/A
         Date Code     : N/A
         Transceiver Replacement : not replaceable
```

■SFP information is not displayed correctly.

<Solution> SFP may be damaged. Replace SFP transceiver.

```
Device: hfcldd0  WWPN: XXXXXXXXXXXXXXXX    Status: Isolate(SFPFail)
  SFP Part Number   : incorrect data(xxxxxxxxxxxxxxxx)
         Serial Number : incorrect data()
         Date Code     : incorrect data()
         Transceiver Replacement : not replaceable
```

Execute Isolate SFP

You can isolate the adapter port selecting ‘Select SFP Operations’-’ 2. Isolate SFP’. You have to isolate SFP before replacing SFP while OS in operation.

```
------------------------------------------------------------
 Hitachi HBA Utility for Linux. Version 1.0.2.65 (06/17/2009)
 Copyright (c) 2004-2009, Hitachi Ltd.
------------------------------------------------------------

Main Menu
---------
 1 . Display Current Component
 2 . Display Auto Map Parameter
 3 . Set Auto Map Parameter
 4 . Display HBA Adapter Number
 5 . Modify  HBA Adapter Number
 6 . Display Current Persistent Bindings
 7 . Modify  Persistent Bindings
 8 . Display HBA Parameters
 9 . Set HBA Parameters
 10. SFP Transceiver Replacement

 99. Exit

Enter number => 10

Select SFP Operations:
 1 . Display SFP Information
 2 . Isolate SFP
 3 . Recover SFP

 99. Cancel

Enter number => 2

Enter adapter <Device Name>
      ( hfclddx, X to Cancel ) => hfcldd0
Do you execute it? (Y/N) :y
Succeeded.

Return to Main Menu =>
```

[Response messages]

No	Response message	Meaning
1	Succeeded.	Normal end
2	The adapter port has already isolated	The specified port has been already isolated. Comfirm the port status using'1. Display SFP Information'.
3	The adapter port status is CHECK-STOP.	The specified port is check stopped state. Comfirm the port status using'1. Display SFP Information'.
4	Not support, LPAR mode.	LPAR guest does not support this command.
5	This Firmware version does not support hot swap feature of SFP Transceiver.	Adapter firmware does not support SFP isolate command.

Execute Recover SFP

You can recover the adapter port selecting 'Select SFP Operations'-' 3. Recover SFP'. You have to recover SFP after replacing SFP while OS in operation.

```
------------------------------------------------------------
 Hitachi HBA Utility for Linux. Version 1.0.2.65 (06/17/2009)
 Copyright (c) 2004-2009, Hitachi Ltd.
------------------------------------------------------------

Main Menu
---------
 1 . Display Current Component
 2 . Display Auto Map Parameter
 3 . Set Auto Map Parameter
 4 . Display HBA Adapter Number
 5 . Modify  HBA Adapter Number
 6 . Display Current Persistent Bindings
 7 . Modify  Persistent Bindings
 8 . Display HBA Parameters
 9 . Set HBA Parameters
 10. SFP Transceiver Replacement

 99. Exit

Enter number => 10

Select SFP Operations:
 1 . Display SFP Information
 2 . Isolate SFP
 3 . Recover SFP

 99. Cancel

Enter number => 3

Enter adapter <Device Name>
      ( hfclddx, X to Cancel ) => hfcldd0
Do you execute it? (Y/N) :y
Succeeded.

Return to Main Menu =>
```

CLI Mode

You can specify either short option or long option. The upper command shows short option and the lower option shows the long oprion in the following command examples.

CLI options

command	Option	Feature
hfcddutil	-v, --ver	Display version of this utilily
	-h, --help	Display this help and exit
	-i, --dspamp	Display Auto Map Parameter
	-j, --setamp	Set Auto Map Parameter
	-k, --dspcpb	Display Current Persistent Bindings
	-l, --modpb	Modify Persistent Bindings
	-m, --dsphan	Display HBA Adapter Number
	-n, --modhan	Modify HBA Adapter Number
	-o, --dsphp	Display HBA Parameters
	-p, --sethp	Set HBA Parameters
	-w, --dspcom	Display Current Component
	--sfp	Display SFP Information and Isolate/Recover SFP

This section describes the detail of the commands. The following symbols are used.
[ ]: You can omit the options in parenthesis.
{A|B}: You can select the option A or B.
<options>.. : You can select multiple <option>.

- CLI mode: Display version of the utility software.

```
# hfcddutil -v
# hfcddutil --ver
```

[Example]

```
------------------------------------------------------------
 Hitachi HBA Utility for Linux. Version 1.0.2.65 (06/17/2009)
 Copyright (c) 2004-2009, Hitachi Ltd.
------------------------------------------------------------
```

- CLI mode: Display This Help and Exit

Display help information

```
# hfcddutil -h
# hfcddutil --help
```

- CLI mode: Display Current Component

```
# hfcddutil -w
# hfcddutil --dspcom
```

[Example]

```
<Display Current Component>
  Adapter: 00,  WWPN: 5000087000300130
  Adapter: 00,  Target: 000,  WWPN: 50060e8000427810
  Adapter: 00,  Target: 000,  WWNN: 50060e8000427810
  Adapter: 00,  Target: 001,  WWPN: 50060e8000427811
  Adapter: 00,  Target: 001,  WWNN: 50060e8000427811
  Adapter: 01,  WWPN: 5000087000300020
  Adapter: 01,  Target: 000,  WWPN: 50060e8000427810
  Adapter: 01,  Target: 000,  WWNN: 50060e8000427810
  Adapter: 01,  Target: 001,  WWPN: 50060e8000427811
  Adapter: 01,  Target: 001,  WWNN: 50060e8000427811
```

q CLI mode: Display Auto Map Parameter

You can confirm Automap parameter stored in /etc/modules.conf on RHEL3 or /etc/modprobe.conf on RHEL4.

```
# hfcddutil -i
# hfcddutil --dspamp
```

[Example]

```
Auto Map Parameter (in /etc/modules.conf):
 hfc_automap=1 (Automap On)
```

[Display/Set items]

No	hfc_automap	Meaning
1	0	Auto map is disabled. Persistent binding feature becomes effective.
2	1 (default)	Auto map is enabled. Persistent binding feature doen not become effective.
3	It is not yet set.	Auto map parameter is not set in /etc/modules.conf. Auto map is enabled.

q CLI mode: Set Auto Map Parameter

You can set Auto Map Parameter in /etc/modules.conf on RHEL3 or /etc/modprobe.conf on RHEL4

When you register persistent binding information, you have to set Auto Map parameter disabled. Then update RAMDISK image.

```
# hfcddutil -j [value]
# hfcddutil --setamp [value]
```

[Display/Set items]

No	Meaning
[value]	0: Automap Off, 1: Automap On

(4) Please set the Persistent Binding setting “enable” to make effective the Persistent Binding function. The following table shows the relation between the settings and the Effectiveness of Persistent Binding function.

Table Effectiveness of Persistent Binding function

No.	Persistent Binding setting	AutoMap setting	the Effectiveness of Persistent Binding function
1	Enable	off	effective
2		on	ineffective
3	Disable	off	
4		on	

- CLI mode: Display HBA Adapter Number

You can confirm adpter number registered in /etc/hfcldd.conf.

```
# hfcddutil -m
# hfcddutil --dsphan
```

[Example]

```
Adapter Number - World Wide Port Name (in /etc/hfcldd.conf):
 00            - 5000087000302100
 01            - 5000087000302102
 02            - 50000870003021b8
 03            - 50000870003021ba
```

- CLI mode: Modify HBA Adapter Number

  You have to allocate the adapter number beforehand when setting driver parameters or using Persistent Binding feature. This setting is registered in /etc/modules.conf.

  [Allocate or modify adapter number]

```
# hfcddutil -n -T [instance] [wwpn]
# hfcddutil --modhan --sanh [instance] [wwpn]
```

  [Delete adapter number]

```
# hfcddutil -n -U
# hfcddutil --modhan --dhan [instance]
```

- CLI mode: Display Persistent Bindings

  You can confirm persistent binding information stored in /etc/hfcldd.conf.

```
# hfcmputil -k
# hfcmputil --dspcpb
```

[Example]

```
Adapter Number - World Wide Port Name (in /etc/hfcldd.conf):
 00            - 5000087000300130
 01            - 5000087000300020

Persistent Bindings (in /etc/hfcldd.conf):
 001.  Adapter: 00,  Target: 000,  WWPN: 50060e8000427810
 002.  Adapter: 00,  Target: 000,  WWNN: 50060e8000427810
 003.  Adapter: 00,  Target: 001,  WWPN: 50060e8000427811
 004.  Adapter: 00,  Target: 001,  WWNN: 50060e8000427811
 005.  Adapter: 01,  Target: 000,  WWPN: 50060e8000427810
 006.  Adapter: 01,  Target: 000,  WWNN: 50060e8000427810
 007.  Adapter: 01,  Target: 001,  WWPN: 50060e8000427811
 008.  Adapter: 01,  Target: 001,  WWNN: 50060e8000427811
```

Item	Meaning
AdapterNum	Adapter number is displayed in decimal number.
AdapterPortName	Adapter portname is displayed in hexdecimal number.
TargetNodeName	Target nodename is displayed in hexdecimal number.。
TargetPortName	Target portname is displayed in hexdecimal number.
Tid	Target ID is displayed in decimal number.

q CLI mode: Modify Persistent Bindings

The parameters for persistent binding information to the current configuration can be automatically created and stored in /etc/hfcldd.conf file using "Modify Persistent Bindings-Make All Bindings Automatically".

(1)

```
# hfcddutil -l -N
# hfcddutil --modpb --bta
```

(2)

```
# hfcddutil -l -O -A
# hfcddutil --modpb --db --all
```

q **CLI mode: Display HBA Parameters**

You can confirm persistent parameter settings stored in /etc/hfcldd.conf.

```
# hfcddutil -o
# hfcddutil --dsphp
```

[Example]

```
Display HBA Parameters (in /etc/hfcldd.conf):
  hfc0_connection_type=2 (0:Auto, 1:Point to Point, 2:FC-AL)
  hfc0_link_speed=2 (0:Auto, 1:1 Gbps, 2:2 Gbps, 4:4 Gbps)
  hfc0_max_transfer=16 (1:1 MB, 4:4 MB, 8:8 MB, 16:16 MB)
  hfc1_connection_type=2 (0:Auto, 1:Point to Point, 2:FC-AL)
  hfc1_link_speed=2 (0:Auto, 1:1 Gbps, 2:2 Gbps, 4:4 Gbps)
  hfc1_max_transfer=16 (1:1 MB, 4:4 MB, 8:8 MB, 16:16 MB)
```

【Display items】 The format is [param][instance]=[value].

Item	Meaning
[instance]	Adapter number (0～63)
[param]	Driver parameter name (character)
[value]	The range for the driver parameter. hfc_connection_type (Decimal, 0:Auto, 1:Point to Point, 2:FC-AL) hfc_link_speed (Decimal, 0:Auto, 1:1 Gbps, 2:2 Gbps, 4:4 Gbps) hfc_max_transfer (Decimal, 1:1 MB, 4:4 MB, 8:8 MB, 16:16 MB) hfc_link_down (Decimal, 0-60) hfc_reset_delay (Decimal, 0-60) hfc_mck_retry (Decimal, 0-10) hfc_preferred_alpa (hexdecimal, 0x01-0xef) hfc_reset_timeout (Decimal, 0-60) hfc_abort_timeout (Decimal, 0-60) hfc_queue_depth (Decimal, 1-32) hfc_scsi_allowed (Decimal, 1-30)

q CLI mode: Set HBA Parameters

You can set or delete a driver parameter. After executing the command, update RAMDISK image.

(Set a driver parameter for an adapter)

```
# hfcddutil -p -P [instance] [param] [value]
# hfcddutil --sethp --se [instance] [param] [value]
```

(Set a driver parameter for all adapters)

```
# hfcddutil -p -Q [param] [value]
# hfcddutil --sethp --sa [param] [value]
```

(Delete a driver parameter for an adapter)

```
# hfcddutil -p -R [instance] [param]
# hfcddutil --sethp --de [instance] [param]
```

(Delete a driver parameter for all adapters)

```
# hfcddutil -p -S [param]
# hfcddutil --sethp --da [param]
```

【Items】

Item	Meaning
[instance]	Adapter number (Decimal 0～63)
[param]	Driver parameter name (character)
[value]	The range for the driver parameter hfc_connection_type (Decimal, 0:Auto, 1:Point to Point, 2:FC-AL) hfc_link_speed (Decimal, 0:Auto, 1:1 Gbps, 2:2 Gbps, 4:4 Gbps) hfc_max_transfer (Decimal, 1:1 MB, 4:4 MB, 8:8 MB, 16:16 MB) hfc_link_down (Decimal, 0-60) hfc_reset_delay (Decimal, 0-60) hfc_mck_retry (Decimal, 0-10) hfc_preferred_alpa (Hexdecimal, 0x01-0xef) hfc_reset_timeout (Decimal, 0-60) hfc_abort_timeout (Decimal, 0-60) hfc_queue_depth (Decimal, 1-32) hfc_scsi_allowed (Decimal, 1-30)

- CLI mode: Display SFP Information and Isolate/Recover SFP

  Isolate or recover adapter port when replace SFP transceiver while system is running.

  Refer to 'Hitachi Compute Blade system user's guide' for how to replace SFP.

- Display SFP Information

  You can confirm SFP information. Refer to explanation in the menu mode.

  ```
  # hfcddutil --sfp
  ```

  [Example]

  ```
          Device: hfcldd0    WWPN: XXXXXXXXXXXXXXXX    Status: LinkUp
              SFP Part Number   : xxxxxxxxxxxxxxxx
                  Serial Number : yyyyyyyyyyyyyyyy
                  Date Code     : zzzzzzzz
                  Transceiver Replacement : not replaceable

          Device: hfcldd1    WWPN: XXXXXXXXXXXXXXXX    Status: LinkDown
              SFP Part Number   : xxxxxxxxxxxxxxxx
                  Serial Number : yyyyyyyyyyyyyyyy
                  Date Code     : zzzzzzzz
                  Transceiver Replacement : not replaceable
  ```

- **Execute Isolate SFP**

  You can isolate the adapter port. You have to isolate SFP before replacing SFP while OS in operation. Refer to explanation in the menu mode.

  ```
  # hfcddutil --sfp [hfclddX] <force>
  ```

  [Options]

Item	Meaning
<force>	# Omit the (y/n) confirmation message at time of execution

  [Example] Isolate SFP of hfcldd0.

  ```
  # hfcddutil --sfp hfcldd0

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

  Succeeded.
  ```

q **Execute Recover SFP**

You can recover the adapter port. You have to recover SFP after replacing SFP while OS in operation. Refer to explanation in the menu mode.

```
# hfcddutil --sfp [hfclddX] clear <force>
```

[Options]

Item	Meaning
<force>	# Omit the (y/n) confirmation message at time of execution

[Example] Recover SFP of hfcldd0.

```
# hfcddutil --sfp hfcldd0 clear

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

Succeeded.
```

q How to make hfcddutil settings effective

The following operation is necessary to make the contents set by the hfcddutil command effective.

(1) Update the RAMDISK image.

cd /boot : In cases of IA-32 and x86_64

(# cd /boot/efi/efi/redhat : In case of IA-64)

/sbin/mkinitrd -f initrd-<kernel version>.img <kernel version>

(2) Reboot the system.

6

hfcbios

After OS starts, you can set various setup parameters of HBA BIOS with the hfcbios command.

You cannot use the hfcbios command in the LPAR mode of LPAR manager.

Set various setup parameters from the EFI driver which operates in LPAR mode. Refer to Hitachi Gigabit Fibre Channel Adapter User’s guide (BIOS/EFI Edition) for details.

Function list

(1) Scan all ports of adapters installed in the system

(2) Back up HBA BIOS setup data

(3) Restore HBA BIOS setup data

(4) Confirm HBA BIOS setup data

(5) Apply HBA BIOS setup data in the system.

(6) Set HBA BIOS setup parameters

Prior preparation

(1) Login the system for Windows in "Administrator authority". Login the system for Linux in "root".

(2) Please confirm other utility software or the applications are not started. Please stop everything when starting.

(3) It is necessary to execute the operation based on "Apply HBA BIOS setup data in the adapter" or to reactivate the system after HBA BIOS is set up.

(4) Please execute the backup of the HBA BIOS setup data beforehand.

Scan all ports to HBA installed in system

It is necessary to know the logical device name of the adapter beforehand to set HBA BIOS to each adapter.
Please move to directory (*) that installs the utility software, and execute the following commands.
(*) Windows: :\ProgramFiles\Hitachi\drivers\hba
(:\Program Files (x86)\Hitachi\drivers \hba, for X86_64 and IA-64)
Linux: /opt/hitachi/drivers/hba

Windows:
 # hfcbios –o devshow
Linux:
 # ./hfcbios –o devshow

In the following, we show the execution example in Windows.

```
# hfcbios -o devshow
hfcbios Ver. X.X.X.X  Copyright(C) 2006. Hitachi, Ltd.
+---------+----------+-----+-----+-----+-----------------+-----------------+
            DEVICE    PCI   PCI   PCI    FC                ORIGINAL
  DEVICE    ID        BUS#  DEV#  FUNC#  WWN               WWN
+---------+----------+-----+-----+-----+-----------------+-----------------+
  scsi4     30091054     2     0     0   500008700030000A  500008700030000A
+---------+----------+-----+-----+-----+-----------------+-----------------+
```

logical device name

(1) Compare displayed ORIGINAL WWN to WWPN (white seal) described on the adapter, and acquire a corresponding logical device name.
(2) The PCI bus number, the device number, and the function number of the logical device are needed to reflect the HBA BIOS setup data for the adapter in Windows.

Back up HBA BIOS setup data

Backs up various setup data of HBA BIOS.

Please move to directory that install the utility software, and execute the following commands. It displays the HBA BIOS setup data being set now, and please back up HBA BIOS setup data after confirming set values with "Table setup items and values". (*)

(*)There is a possibility that correct data cannot be acquired in the adapter that does not work normally when executing it. Please note that there is a possibility that the adapter does not work normally when the data is restored.

Windows:

 # hfcbios [-c] {-d logical device name | -a} –o backup –f stored directory

Linux:

 # ./hfcbios [-c] {-d logical device name | -a} –o backup –f stored directory

-d: Specifies the logical device. (It is not possible to use it together with -a.)

-a: Backs the HBA BIOS setup data of all ports to HBA installed in the system up.
(It is not possible to use it together with -d.)
-f: Specifies the stored directory of the backup file
-c: Skips the confirmation of Y/N.

In the following, we show the execution example in Windows.

```
# hfcbios -d scsi4 -o backup -f C:\
hfcbios Ver. X.X.X.X  Copyright(C) 2006. Hitachi, Ltd.
Current Configure : scsi4
 HBA BIOS                        : ENABLE
 BOOT PRIORITY                   : ENABLE
                                    •
                                    •
                                    •
Backup is OK?
  (Y/N) : y
Backup of c:\\30091054.02.00.00.00.BK succeeded for scsi4.
```

Restore HBA BIOS setup data

Restore various setup data of HBA BIOS.

Please move to directory that install the utility software, and execute the following commands. It displays the HBA BIOS setup data being set now, and please back up HBA BIOS setup data after confirming set values with "Table setup items and values".(*)

(*)There is a possibility that correct data cannot be acquired in the adapter that does not work normally when executing it. Please note that there is a possibility that the adapter does not work normally when the data is restored.

Windows:

hfcbios [-c] -d logical device name –o restore –f restored file name

Linux:

./hfcbios [-c] -d logical device name –o restore –f restored file name

-f: Specifies the restored path.

-c: Skips the confirmation of Y/N.

In the following, we show the execution example in Windows.

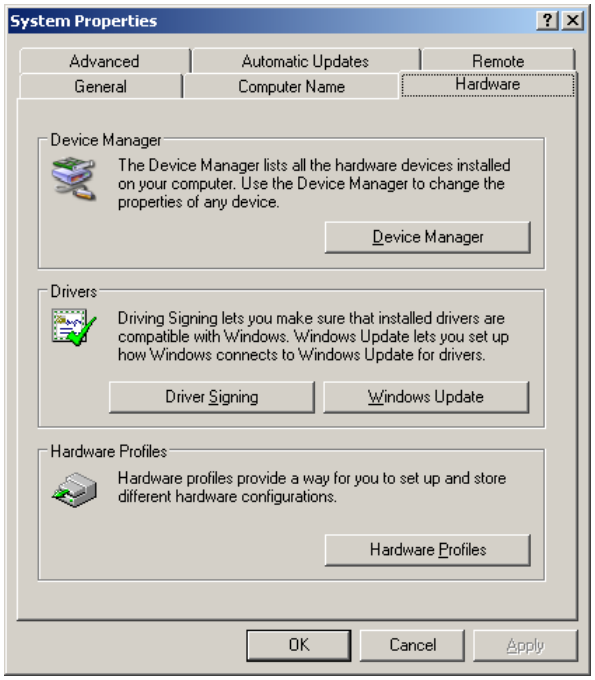
```
# hfcbios -d scsi4 -o restore -f c:\30091054.02.00.00.00.BK
hfcbios Ver. X.X.X.X  Copyright(C) 2006. Hitachi, Ltd.
Backup Data
+----------+------+---------+-----------+------------------+
  DEVICE     PCI    PCI       PCI         ORIGINAL
  ID#        BUS#   DEVICE#   FUNCTION#   WWN
+----------+------+---------+-----------+------------------+
  30091054      2         0           0   500008700030000A
+----------+------+---------+-----------+------------------+
Setup Configure   : scsi4
 HBA BIOS                       : ENABLE
          .
          .
          .
Restore is OK?
  (Y/N) : y
Setup succeeded.
Need reboot the system to update this.
```

Apply HBA BIOS setup data

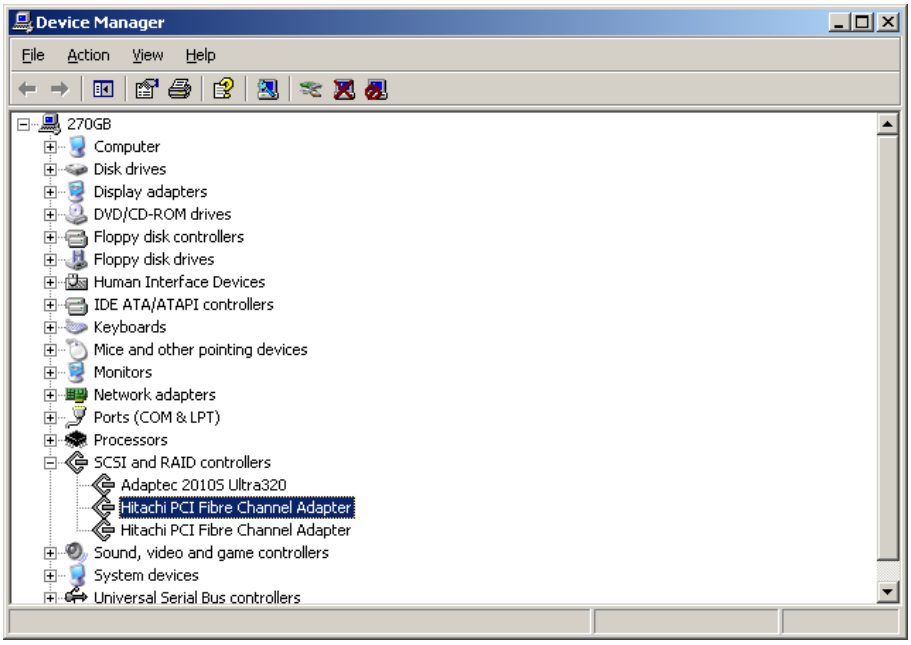
Apply various setup data of HBA BIOS. Currently this command is not available on Linux.

Windows:

(1) Select “Start”, “Control Panel” and “system” from the desktop.
(2) Select the "Hardware" tab and click “Device Manager”.

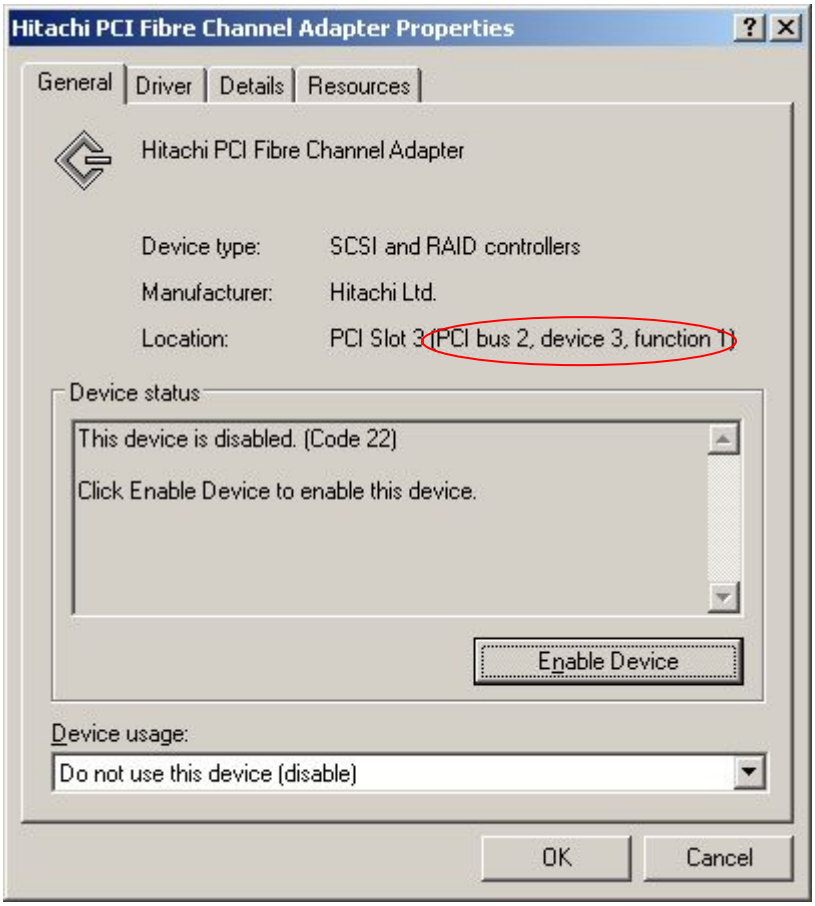


(3) Double click “SCSI and RAID controllers” then make sure that “Hitachi PCI Fibre Channel Adapter" is present.

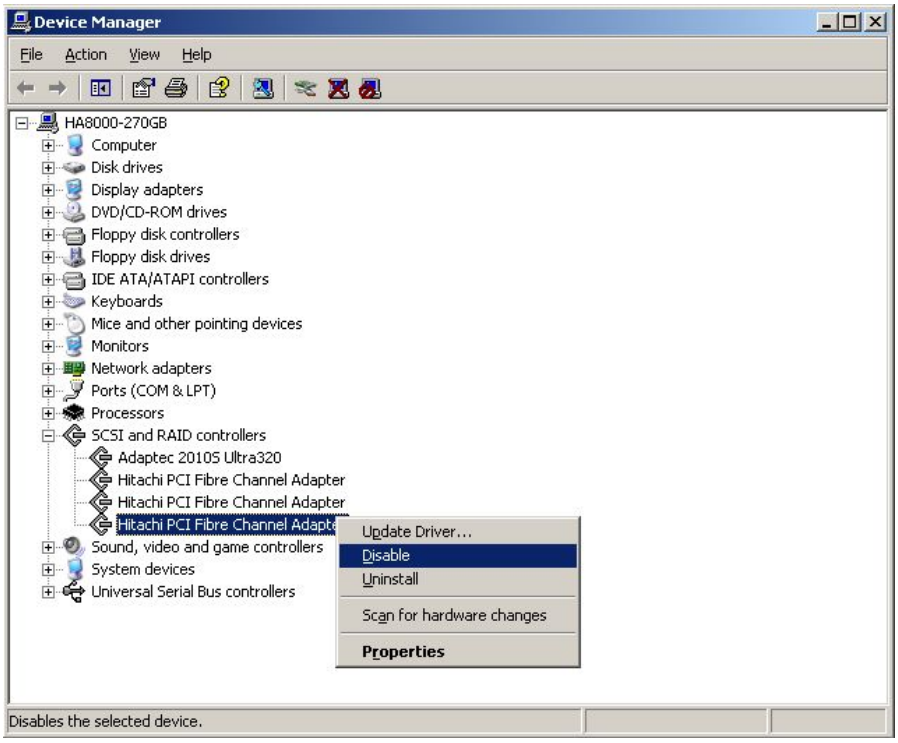


(4) Double click "Hitachi PCI Fibre Channel Adapter".

(5) Click "General" tab and look for same "Hitachi PCI Fibre Channel Adapter" as PCI bus number, device number and function number of "Location" that confirmed by "Scan all ports to HBA installed in system".

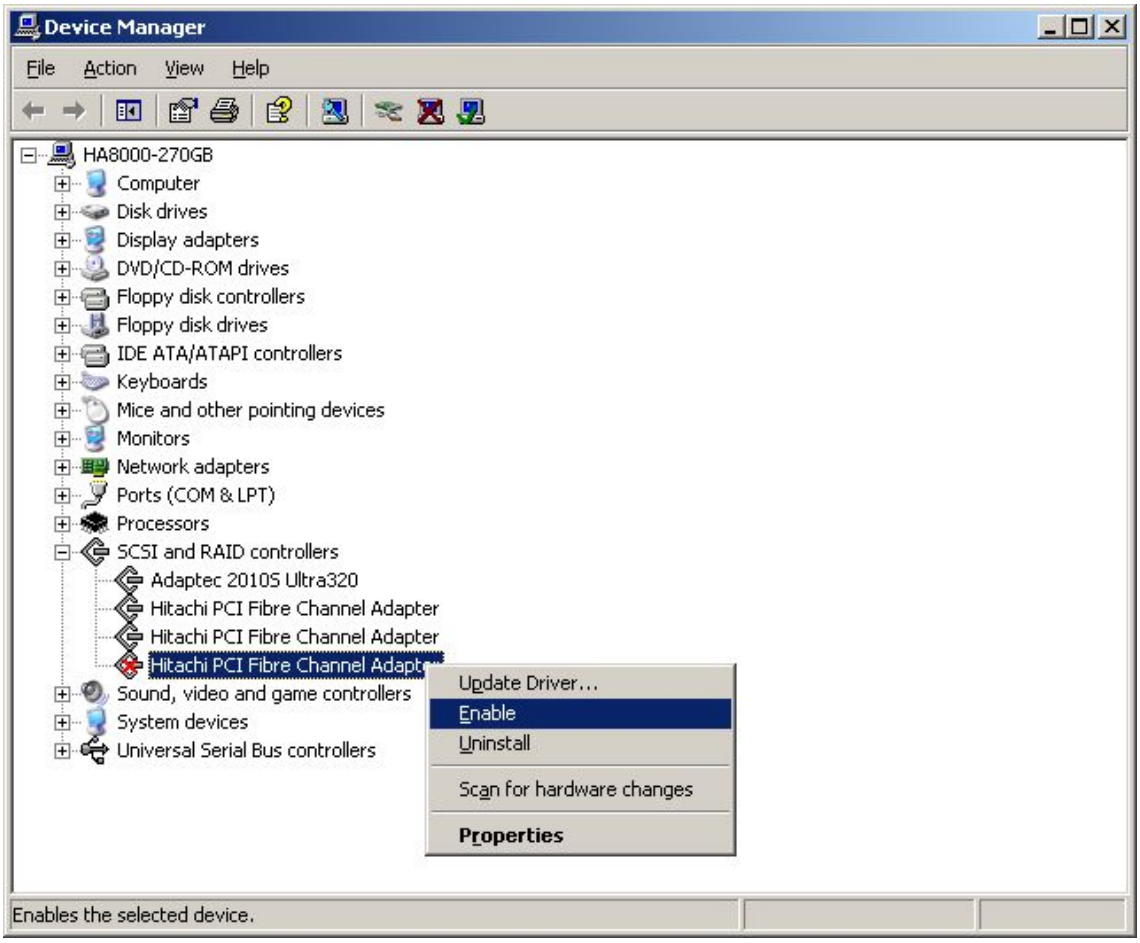


(1) Select "Hitachi PCI Fibre Channel Adapter" of "SCSI and RAID controllers" and right-click "Disable".



(2) Confirm that the FC cable is not connected with the device and click "Yes".

(3) Select "Hitachi PCI Fibre Channel Adapter" of "SCSI and RAID controllers" and right-click "Enable".


Device Manager
File Action View Help
HA8000-270GB
Computer
Disk drives
Display adapters
DVD/CD-ROM drives
Floppy disk controllers
Floppy disk drives
IDE ATA/ATAPI controllers
Keyboards
Mice and other pointing devices
Monitors
Network adapters
Ports (COM & LPT)
Processors
SCSI and RAID controllers
Adaptec 2010S Ultra320
Hitachi PCI Fibre Channel Adapter
Hitachi PCI Fibre Channel Adapter
Hitachi PCI Fibre Channel Adapt
Sound, video and game controllers
System devices
Universal Serial Bus controllers
Update Driver...
Enable
Uninstall
Scan for hardware changes
Properties
Enables the selected device.

Confirm HBA BIOS parameters

Confirms various setup data of HBA BIOS.
Please move to directory that install the utility software, and execute the following commands. It displays the HBA BIOS setup data being set now, and please back up HBA BIOS setup data after confirming set values with "Table setup items and values"(P94).

Windows:
 # hfcbios -d logical device name –o cfgshow
Linux:
 # ./hfcbios -d logical device name –o cfgshow

In the following, we show the execution example in Windows.

```
# hfcbios -d scsi4 -o cfgshow
hfcbios Ver. X.X.X.X  Copyright(C) 2006. Hitachi, Ltd.
Configure Show : scsi4
 HBA BIOS                        : ENABLE
 BOOT PRIORITY                   : ENABLE
          TARGET WWN      LUN    PRIORITY
  +---+------------------+-----+------------+
    1   50060E8000C27992   00      HIGH
    2   0000000000000000   00
    3   0000000000000000   00
    4   0000000000000000   00
    5   0000000000000000   00
    6   0000000000000000   00
    7   0000000000000000   00
    8   0000000000000000   00      LOW
  +---+------------------+-----+------------+
 SPINUP DELAY                    : DISABLE
 CONNECTION TYPE                 : AUTO DETECTION (LOOP PREFERRED)
 DATA RATE                       : AUTO DETECTION
 PERSISTENT BINDINGS             : ENABLE
 FORCE DEFAULT PARAMETER         : DISABLE
 Additional World Wide Port Name : 0000000000000000
 LOGIN DELAY TIME                :  3sec.   (Max:60sec.)
                                            (Default:3sec.)
 PRE CONFIGURE                   : DISABLE
```

Set HBA BIOS parameters

Set various parameters of HBA BIOS setup data.

Please move to directory (*) that installs the utility software, and execute the following commands.

(*) Windows: :\ProgramFiles\Hitachi\drivers\hba

(:\Program Files (x86)\Hitachi\drivers \hba, for X86_64 and IA-64)

Linux: /opt/hitachi/drivers/hba

Windows:

hfcbios [-c] -d logical device name –p parameter=specified value

Linux:

./hfcbios [-c] -d logical device name –p parameter=specified value

parameter: Specifies the parameter of "Table Setup items and values".

specified value: Specifies a value from “Specified range” of "Table Setup items and values".

When you specify two or more values, you have to enclose them with “ and insert “,” between values.

(ex. –p boot_device=”1,5000087000302222,FF”)

-c: Skips the confirmation of Y/N.

In the following, we show the execution example in Windows.

```
# hfcbios -d scsi4 -p bios=enable
hfcbios Ver. X.X.X.X  Copyright(C) 2006. Hitachi, Ltd.
Current Configure : scsi4
 HBA BIOS                       : ENABLE
Setup Configure   : scsi4
 HBA BIOS                       : ENABLE
Setup is OK?
  (Y/N) : y
Setup was successful.
Need reboot the system to update this.
```

HBA BIOS parameters

The table below shows the default value and the specified range of each HBA BIOS setup parameter.

Table Setup items and values

Setup items	Parameter	Default	Specified range	Description
HBA BIOS ENABLE/DISABLE	bios	Disable	Enable/Disable	Sets HBA BIOS valid or invalid. It sets it to "Enable" when using it as the boot path.
BOOT PRIORITY	boot_priority	Disable	Enable/Disable	Makes the list of the boot devices effective. When the priority level is specified for the boot device, it sets it to "Enable".
	boot_device	-	1-8 (Priority Level)	It registers the boot device (WWPN and LUN) in the specified priority level on the list of the boot device.
		All 0	(WWPN)	
		0	0-FFFF (LUN)(*1)	
	boot_device_clear	-	1-8 (Priority Level)	It deletes the boot device (WWPN and LUN) registered in the specified priority level from the list of the boot device.
SPINUP DELAY	spinup_delay	Disable	Enable/Disable	When the spinup waiting time of max. five minutes is inserted until the disk becomes READY, it sets it to "Enable".
CONNECTION TYPE	connection_type	Auto	Auto (Auto Detection) PtoP (Point to Point Only) loop (loop Only)	The connection type in the FC interface is specified. It usually uses it by "Auto Detection" setting.
DATA RATE (*2)	data_rate	Auto	Auto (Auto Detection) 1/2/4 (Gbps Only)	The data rate in the FC interface is specified. It usually uses it by "Auto Detection" setting.
PERSISTENT BINDINGS ENABLE/DISABLE	persistent_bindings	Enable	Enable/Disable	When it is necessary to invalidate the Persistent Binding function, this setting must be "Disable".
FORCE DEFAULT PARAMETER	force_default_parameter	Disable	Enable/Disable	When the driver is instructed to disregard the value set with the parameter setting tool (*3), and to use the default value, it sets it to "Enable".

Additional World Wide Port Name	wwn_of_hba	All 0	(WWPN)	It is possible to refer and change the content of Additional WWPN used by the Pre-configure function.(*4)
LOGIN DELAY TIME	login_delay_time	Default (3sec)	0-60 (sec)/default	When it is necessary to delay the LOGIN process to the device at FC-SW cascade connection etc., this setting specifies the Delay Time.
PRE CONFIGURE	pre_configure	Disable	Enable/Disable	When the Pre-configure function is used after HotPlug is executed, it sets it to " Enable".(*4)

(*1) This range varies according to F/W version. If the version is newer than 2x0800, the range is '0-FFFF', and the version is older than 2x0800, the range is '0-FF'.

(*2) This parameter can be set in HBA driver and hfcbios. If the both parameters are enabled, the parameter in the HBA driver will be used. So if you want to use the parameter in hfcbios, please remove the setting in the HBA driver.

(*3) Windows:「hfcutil」, Linux:「hfcddutil」

(*4) If the N+M Cold Standby function is enabled, the function will be effective after next reboot. When the function is effective, WWPN and Pre-configure variable of the HBA will be under the control of the Hitachi Compute Blade system.

7

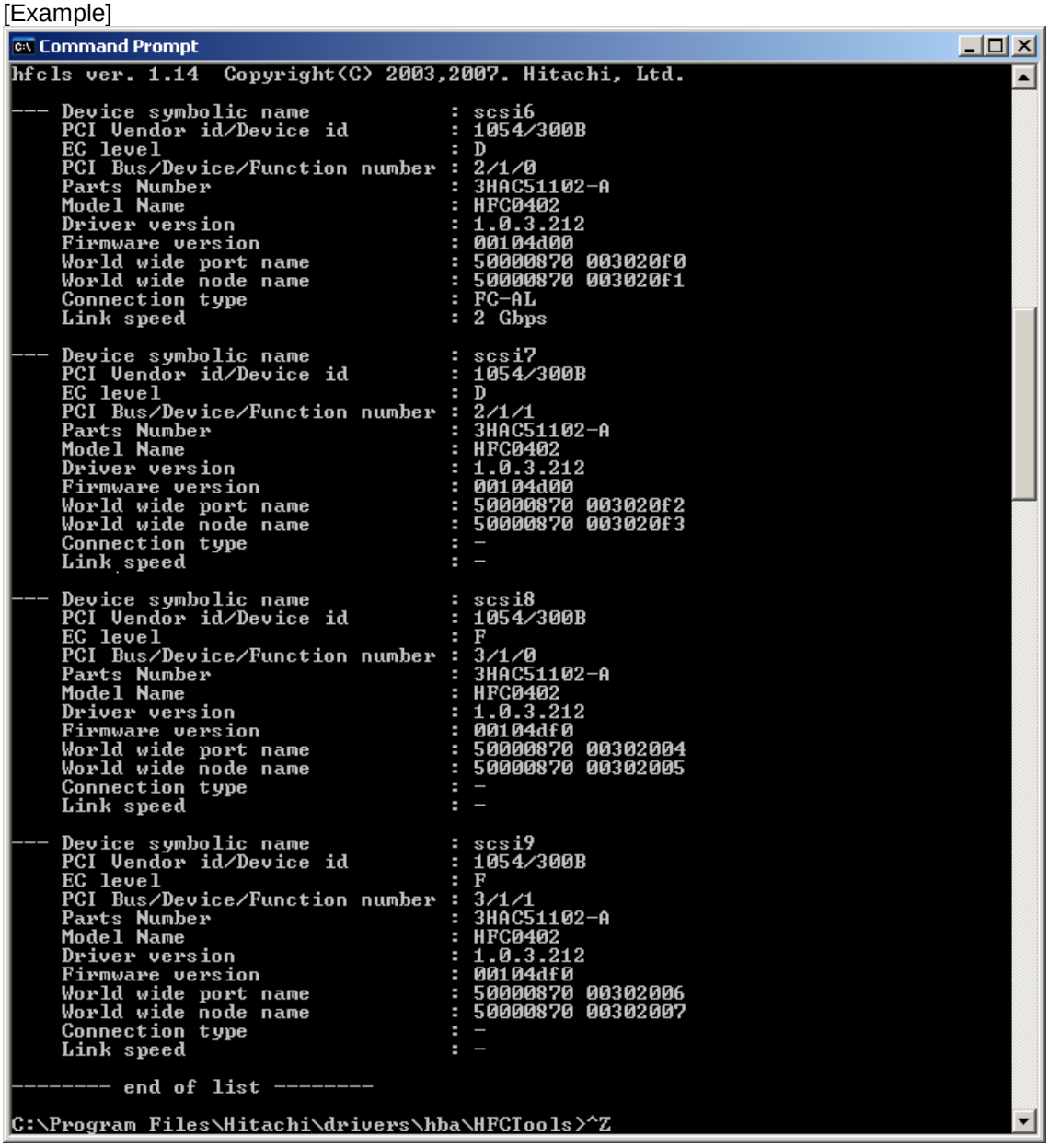
hfcls on Windows

hfcls

Move to the directory that you installed the utility software, and input ‘hfcls’.

No.	Items	Description
1	Device symbolic name	Logical device name
2	PCI Vendor id/Device id	Vendor ID/Device ID
3	EC level	Board revision
4	PCI Bus/Device/Function number	Bus/device/Function number
5	Parts Number	Parts number
6	Model Name	Model name
7	Driver version	Driver version
8	Firmware version	Firmware version
9	World wide port name	WWPN
10	World wide node name	WWNN
11	Connection type	Connection type between the connected device and the adapter port. ‘-‘ is displayed when poer is in LinkDown state.
12	Link speed	Connection speed between the connected device and the adapter port. ‘-‘ is displayed when poer is in LinkDown state.

[Example]


Command Prompt
hfcls ver. 1.14 Copyright(C) 2003,2007. Hitachi, Ltd.
--- Device symbolic name : scsi6
PCI Vendor id/Device id : 1054/300B
EC level : D
PCI Bus/Device/Function number : 2/1/0
Parts Number : 3HAC51102-A
Model Name : HFC0402
Driver version : 1.0.3.212
Firmware version : 00104d00
World wide port name : 50000870 003020f0
World wide node name : 50000870 003020f1
Connection type : FC-AL
Link speed : 2 Gbps
--- Device symbolic name : scsi7
PCI Vendor id/Device id : 1054/300B
EC level : D
PCI Bus/Device/Function number : 2/1/1
Parts Number : 3HAC51102-A
Model Name : HFC0402
Driver version : 1.0.3.212
Firmware version : 00104d00
World wide port name : 50000870 003020f2
World wide node name : 50000870 003020f3
Connection type : -
Link speed : -
--- Device symbolic name : scsi8
PCI Vendor id/Device id : 1054/300B
EC level : F
PCI Bus/Device/Function number : 3/1/0
Parts Number : 3HAC51102-A
Model Name : HFC0402
Driver version : 1.0.3.212
Firmware version : 00104df0
World wide port name : 50000870 00302004
World wide node name : 50000870 00302005
Connection type : -
Link speed : -
--- Device symbolic name : scsi9
PCI Vendor id/Device id : 1054/300B
EC level : F
PCI Bus/Device/Function number : 3/1/1
Parts Number : 3HAC51102-A
Model Name : HFC0402
Driver version : 1.0.3.212
Firmware version : 00104df0
World wide port name : 50000870 00302006
World wide node name : 50000870 00302007
Connection type : -
Link speed : -
-------- end of list --------
C:\Program Files\Hitachi\drivers\hba\HFCTools>^Z

8

hfcmcup

Precautions

- Download the latest driver from the Hitachi web site.
- Back up the firmware before updating the firmware.
- When updating FLASH-ROM, do not close the working window, terminate the command forcibly, turn the power off or reboot the system. There operation might damage FLASH-ROM and may lead the failure of the Hitachi Gigabit Fibre Channel Adapter.
- To update, back up or restore the FLASH-ROM usually requires 5 to 10 minutes. However over 60 minutes may be required depending on your server configuration. If your system does not complete these operation over the 10 minutes, refer to the section ‘How to shorten the firmware update process in ‘HITACHI Gigabit Fibre Channel Adapter User’s Guide (Windows driver Edition)’
- When all of the Gigabit Fibre Channel Adapter, the driver and the firmware do not support the firmware Online-update feature, you need to power off and power on to make the updated firmware work on the Gigabit Fibre Channel Adapter. Refer to Hitachi Gigabit Fibre Channel Adapter User’s Guide (Windows driver edition) or Hitachi Gigabit Fibre Channel Adapter User’s Guide (Linux/VMware driver edition) for details.
- For the supported version of the driver and firmware for updating FLASH-ROM from the guest of LPAR manager, refer to Hitachi Gigabit Fibre Channel Adapter User’s Guide (Support Matrix Edition) for details.

Back up and Update FLASH-ROM

[Function]Back up or update FLASH-ROM.

[Syntax]

<Backup>

hfcmcup –d [<logical-device-name>|all] –o backup –f <backup-save-directory> [-c]

<Upgrade>

hfcmcup –d [<logical-device-name>|all]] –o download –f <update-file-name> [-c]

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

all #Execute this command to all logical device name identified by the driver.

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

【Example】Back up FLASH-ROM for an logical device (scsi19)

```
C:\Program Files (x86)\Hitachi\drivers\hba\HFCTools>hfcmcup -d scsi19 -o backup -f c:\
hfcmcup Ver. 2.4.0.18  Copyright(C) 2003, 2010, Hitachi, Ltd.
--- The current microcode level for 300422(scsi19)
backup is OK?
  (Y/N) : y
--- Flash ROM Read-1
--- Flash ROM Read-2
backup finished.
backup file is c:\54102030.300422.EF.5000087000573428.BK

c:\Program Files (x86)\Hitachi\drivers\hba\HFCTools>
```

【Example】Update FLASH-ROM for an logical device (scsi19)

```
c:\Program Files (x86)\Hitachi\drivers\hba\HFCTools>hfcmcup -d scsi19 -o download -f
c:\54102030.00300429.E7
hfcmcup Ver. 2.4.0.18  Copyright(C) 2003, 2010, Hitachi, Ltd.
scsi19 HITACHI FC Adapter
       *** NOTICE *** NOTICE *** NOTICE ***

 The microcode installation occurs while the
 adapter and any attached drives are available
 for use. It is recommended that this installation
 be scheduled during non-peak production periods.

 As with any microcode installation involving
 drives, a current backup should be available.

 Use 'y' to continue the installation.
 Use 'n' or Ctrl-c to cancel the installation.
  (Y/N) : y
--- The current microcode level for 300422(scsi19)
--- Select microcode file: c:\54102030.00300429.E7

CURRENT SYSREV:00300422
UPDATE  SYSREV:00300429

Update is OK?
  (Y/N) : y

sector26 [**************************************************] 100%

Microcode Update finished.
The Update microcode level for 300429(scsi19)
Need reboot the system to update this.
```

[Notes]

(1) On Windows 2000, you have to execute the command only when the adapter port is connected to the IO device and at least one device (disk) is identified.

(2) FLASH-ROM backup file name stored by backup command includes PCI vendor ID, PCI device ID, WWN, the firmware version.

(3) If you execute the update using 'all' option, the execution continues for the next port when the update process failed for the current adapter port. You can specify only one update file. Hitachi Gigabit Fibre Channel Adapter has its own binary file for FLASH-ROM depending on its device ID. If there are multiple types of Hitachi Gigabit Fibre Channel Adapter exist on the same system and execute the update command specifying 'all' option, the command always display the error. FLASH-ROM backup file stored by backup command has WWN inside the file. So the error is displayed except for the target adapter which has the same WWN.

[Error message]

The table below shows the error message when the firmware update tool 'hfcmcup' is executed. When these errors occur, the following processing is interrupted and the program is ended except specifying all option.

Error Message List of hfcmcup

No.	Error messages	Description
	Actions to be taken	
1	Open error.(xxx)	Failed to open device
	Confirm whether the specified device is not opened by other applications and also specified device name is correct. If device name is correct, wait for a while and retry the command. If error messages is displayed when you retry the command, please contact maintenance personel or support service.	
2	unknown device_id (func=hfc_device_type_get)	Unknown device id is specified
	Confirm that specified device is Hitachi Fibre Channel adapter.	
3	Unsupported device id.	Soecified adapter is not supported.
	Installed driver and utility tool may not support specified adapter. Refer to Hitachi Gigabit Fibre Channel Adapter User's Guide (Support Matrix edition) for details.	
4	Flash erase error. (It failed in the elimination of flash)	Failed to erase FLASH-ROM.
	Please contact maintenance personel or support service.	
5	Invalid parameter.	Input parameters are not correct.
	Confirm input parameters and retry command.	
6	memory allocate error Calloc error.	Failed to allocate memory.
	Free memory is short of executing the tool. Terminate other application which consuming memories.	
7	No valid microcode file for <filename> was found in that directory. Microcode files for this adapter have the naming convention <filename>XXXXXX where XXXXXX is the level of the microcode.	Update file does not exist on the specified directory.
	Confirn the directory you specified and retry command.	
8	Input file open error(file name <filename>)	Failed to open update file.
	Confiem the attribute of specified update file.	

9	Input file read error(file name %s)	Failed to read update file.
	Confiem the attribute of specified update file.	
10	Input data error. (WWN is wrong)	Backup files does not match to the sprcified adapter.
	Confiem whether specified backup file matchs to the adapter.	
11	Input data error. (xxxx)	Update file may be corrupt.
	Update file may be corrupt. Please contact maintenance personel or support service.	
12	Flash read error. (Could not read data properly)	Failed to read FLASH-ROM
	Please contact maintenance personel or support service.	
13	Flash write error. (Data was not updated properly)	Error was detected after updating FLASH-ROM
	FLASH-ROM may be corrupt. Please contact maintenance personel or support service.	
14	file <filename> does not exist	Specified file does not exist.
	Confirm input command and options and retry command.	
15	Opendir error(errno=##)	Failed to open specified file.
	Confiem the attribute of specified update file.	
16	too many input file. (The number of the maximums is 256	Can not handle files.
	File number in the directory should be 256 or less. Move unnecessary files to other directory and retry.	
17	backup file write error backup file create error (file name <filename>)	Failed to create backup file.
	There are not enough disk free space left to create backup file. Remove unnecessary files and retry command.	
18	ioctl error. (xxx) ioctl(xxx) xxx error.	ioctl error
	Wait for a while and retry command. [Windows] If HFCTools version is equals to 1.0.3.32 or higher, driver version should be equals to X.Y.6.650 or higher. Otherwise, this error message is displayed. Confirm versions of both driver and HFCTools. Please refer Hitachi Gigabit Fibre Channel Adapter User's Guide (Support Matrix Edition) for details. If the appropriate version of the driver and HFCTools is used, please contact maintenance personel or support service.	
19	another F/W update process is running	
	Confirm whether other FLASH-ROM update command or FW online update command has finished and retry command. If the appropriate version of the driver and HFCTools is used, please contact maintenance personel or support service. Otherwise, please contact maintenance personel or support service.	
20	It is locked with other LPAR.	
	Other LPAR locks the required resouce.	
21	Lock failure of RAM space.	
	Failed to lock RAM space.	
22	Lock release failure of RAM space.	
	Failed to unlock RAM space.	
23	Update file is illegal. Unsupported package code.	Update files does not match to the specified adapter.
	Confirm the update file is appropriate for specified adapter.	
24	directory xx does not exist. drive xx does not exist.	Specified directory or drive does not exist.
	Confirm directory and drive.	

25	OnlineUpdate is reserving it.	Online update procedure is reserved.
	Check online update availablity executing hfcmcref and the status.	
26	INSTALL MICROCODE SYSTEM REVISION CHECK ERROR	Speciefied update file version is older than current FW version.
	Confirm update file version.	
27	other port(s) busy.(xxx)	Busy state.
	Wait for a while and retry command. If the same error is displayed when executing command again, please contact maintenance personel or support service.	
28	lock error(xxx)	Failed to lock.
	Wait for a while and retry command. If the same error is displayed when executing command again, please contact maintenance personel or support service.	
29	RegOpenKeyEx error. RegQueryInfoKey error.	Failed to modify registory.
	Wait for a while and retry command. If the same error is displayed when executing command again, please contact maintenance personel or support service.	
30	Conflict was detected. offset:XXX, read byte:XXX	Update interrupted because some confliction between other process was detected.
	Re-execute this command. In case the error is occurred again, please contact maintenance personel or support service. If this message appears, make sure to re-execute this command. If this message appears and the system is rebooted without re-execute this command, the system may fail to boot.	
31	parity error. (func=hfc_check_parity_error, status=XXX) parity error offset:XXX, read byte:XXX	An error detected during Parity Check process.
	Adapter may be broken. Please contact maintenance personel or support service.	
32	Adapter status busy.please try again later.	Update interrupted because specified adapter card is busy.
	Re-execute this command. In case the error is occurred again, please contact maintenance personel or support service.	

9

hfcmcref

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 (Windows driver Edition)’ or ‘Hitachi Gigabit Fibre Channel Adapter User’s Guide (Linux/VMware driver Edition)’.
For the supported version of the driver, firmware and LPAR manager for this commands from the guest of LPAR manager, refer to Hitachi Gigabit Fibre Channel Adapter User’s Guide (Support Matrix Edition) for details.

Check online update is applicable

[Function]
Check online update is applicable or not.

[Syntax]
<Check online update is applicable>
hfcmcref

<Check online update is applicable for the specified update file>
hfcmcref –f <online update file>

[Execution example 1]

```
c:\Program Files (x86)\Hitachi\drivers\hba\HFCTools>hfcmcref
hfcmcref Ver. 1.0.0.12  Copyright(C) 2010, Hitachi, Ltd.
Device     BUS:DEV.FUNC   Flash      Current   Status (Flash -> Current)
scsi4        5:  0.  0    00300429   00300429  No need
scsi5        5:  0.  1    00300429   00300429  No need
scsi6        6:  0.  0    00300429   00300429  No need
scsi7        6:  0.  1    00300429   00300429  No need
scsi8        7:  0.  0    00300429   00300429  No need
.....
scsi16      11:  0.  0    00300429   00300429  No need
scsi17      11:  0.  1    00300429   00300429  No need
scsi18      12:  0.  0    00300429   00300429  No need
scsi20      96:  0.  0    00300429   00300422  Applicable
scsi21      96:  0.  1    00300429   00300422  Applicable
scsi22      96:  0.  2    00300429   00300422  Applicable
scsi23      96:  0.  3    00300429   00300422  Applicable
```

[Execution example 2]

```
c:\Program Files (x86)\Hitachi\drivers\hba\HFCTools>hfcmcref -f c:\54102030.00300429.E7
hfcmcref Ver. 1.0.0.12  Copyright(C) 2010, Hitachi, Ltd.
Device     BUS:DEV.FUNC   File       Flash      Current    Status (Flash -> Current)
scsi4        5:  0.  0    00300429   00300429   00300429   No need
scsi5        5:  0.  1    00300429   00300429   00300429   No need
scsi6        6:  0.  0    00300429   00300429   00300429   No need
scsi7        6:  0.  1    00300429   00300429   00300429   No need
scsi8        7:  0.  0    00300429   00300429   00300429   No need
.....
scsi16      11:  0.  0    00300429   00300429   00300429   No need
scsi17      11:  0.  1    00300429   00300429   00300429   No need
scsi18      12:  0.  0    00300429   00300429   00300429   No need
scsi20      96:  0.  0    00300429   00300429   00300422   Applicable
scsi21      96:  0.  1    00300429   00300429   00300422   Applicable
scsi22      96:  0.  2    00300429   00300429   00300422   Applicable
scsi23      96:  0.  3    00300429   00300429   00300422   Applicable
```

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 is running now. You are now waiting for the completion of the operation.
NG(Unsupported)	The firmware does not support firmware online update function. You have to transfer the FLASH-ROM data by off-line.
NG(Inapplicable - FW)	Specified 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(ioctl error) *1)	Error occurred when executing ioctl.
NG(flash read error) *1)	Error occurred when reading FLASH-ROM.
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.
NG(Device Busy) *1)	Failed to open device file.

*1) Retry the command to recover the possible temporary error.

For error messages when executing command, refer to [Error message] in the section ‘hfcmcref-Online update of the firmware’.

Online update of the firmware

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

[Syntax]

<Check online update is applicable>
hfcmcref –d <Device>|all} [force]

<Online update>
hfcmgr –u {<Device>|all} [force]

<options>

all	# Execute the command to all logical names.
-c	# Omit the (y/n) confirmation message at time of delete

[Example]

```
# hfcmcref -d all
DEVICE : hfcldd0
FLASH   SYSREV:00220750
CURRENT SYSREV:00220740

FLASH-> CURRENT Update is OK? (Y/N) : y

Update command finished (hfcldd0). please check the F/W update status.

DEVICE : hfcldd1
FLASH   SYSREV:00220750
CURRENT SYSREV:00220740

FLASH-> CURRENT Update is OK? (Y/N) : y

Update command finished (hfcldd1). please check the F/W update status.
#
```

【Error Message】

No.	Error messages	
	Actions to be taken	
1	parameter error	Input command syntax error
	Confirm command syntax.	
	another F/W update process is running.	Other process is executing FLASH-ROM update, backup or Onine-update.
	Confirm whether other FLASH-ROM update, backup commands or FW online update command has finished and retry command.	
2	xxx : ioctl(xxx) error.(xxx) xxx : ioctl_diag(xxx) error.(xxx)	ioctl error
	Wait for a while and retry command. If the same error is displayed when executing command again, please contact maintenance personel or support service.	
3	xxx: flash read error (xxx)	FLASH read error
	Wait for a while and retry command. If the same error is displayed when executing command again, please contact maintenance personel or support service.	
4	adapter status error.	Online update is not applicable to the adapter.
	Confirm the adapter status. Adapter status may be the following. - H/W in the specified Core is MCK, F-STOP or CHK-STOP status. - Operational status of FW in the specified Core is not Normal. - The specified adapter is isolated.	
5	already update.	F/W has already been updated.
	The adapter is already operating on the FW version stored in FLASH-ROM. Check FLASH-ROM version and FW version currently operating on the HW reffering the section ‘Online update of the firmware’ .	
6	update proccess is reserved.	F/W has already been reserved for online update. (Waiting for FW to be idle state)
	Check FLASH-ROM version and FW version currently operating on the HW reffering the section ‘Online update of the firmware’ .	
7	unsupport F/W error.	This FW is not covered by online update.
	Reboot the server for FLASH-ROM to take effect.	
8	inapplicable – FW error. Inapplicable – HW error.	This FW is not covered by online update.
	Reboot the server for FLASH-ROM to take effect.	
9	adapter busy error try again later. other port(s) busy.(xxx) Please execute it again after waiting for the end of other HBA tools.	Adapter is busy.
	Wait for a while and retry command. If the same error is displayed when executing command again, please contact maintenance personel or support service.	
10	xxx is unsupport for FPP.	This HW is not covered by online update
	Reboot the server for FLASH-ROM to take effect.	
11	not found update file	Failed to find update file.
	Confirm the update fil nane and file path.	
12	update file read error. update file access error. update file open error.	Failed to access update file.
	Confirm the attributes of update file.	
13	Update file size error.	Update file size is not correct.
	Specified update file size is not correct. Confirm whether the update file is transferred using binary mode.	

14	Calloc error.	Failed to allocate memory.
	Free memory is short of executing the tool. Terminate other application which consuming memories and retry command.	
15	Open error.(xxx) Unknown Device.	Failed to open specified adapter port.
	Confirm specified device name. If device name is correct, wait for a while and retry command, If the same error is displayed when executing command again, please contact maintenance personel or support service.	
16	unknown device_id.	Specified adapter is not supported
	Driver and utility tools may not support specified adapter. Confirm versions of driver and utility tools. Please refer Hitachi Gigabit Fibre Channel Adapter User's Guide (Support Matrix Edition) for details.	
17	RegOpenKeyEx error. RegQueryInfoKey error.	Failed to modify registry.
	Wait for a while and retry command. If the same error is displayed when executing command again, please contact maintenance personel or support service.	
18	lock error(xxx) Lock failure of RAM space. Lock release failure of RAM space.	Failed to lock required resouces.
	Wait for a while and retry command. If the same error is displayed when executing command again, please contact maintenance personel or support service.	
19	It is locked with other LPAR.	Update command is executing on the other guest at shared FC mode of LPAR manager.
	Confirm whether update command is executing on other guest. Wait for a while and retry command. If the same error is displayed when executing command again, please contact maintenance personel or support service.	

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hfcmig [Windows only]

Windows driver version lower than or equal to x.y.z.470 (Corresponding HFCTools version is 1.0.1.19) and driver version higher than or equal to x.y.z.530 (Corresponding HFCTools version is 1.0.2.22) use different utility program to set parameters.
Refer to Section 5.4 and 5.5 for the criteria of conversion.

This section describes HBA parameter conversion utility ‘hfcmig.exe’. This utility program is located in the same directory as other utility programs. Refer to section 2.2 for details.

Convert parameters to new utility program

[Function] Convert parameter format for hfcmputil.exe to hfcmgr.exe.
[Syntax]
hfcmig -new
[Example]

Sample of executing hfcmig –new

```
> hfcmig -new

Succeeded.
```

The following message is displayed when parameter ConnectionType or LinkSpeed is set. In this case, execute ‘Delete ConnectionType or LinkSpeed parameter’.

Sample of executing hfcmig –new

(When ConnectionType or Linkspeed is set)

```
> hfcmig -new

Succeeded.
Please clear the HBA Parameters(ConnectionType, LinkSpeed) with the
following commands.
"hfcmig -clear"
```

Convert parameters to old utility program

[Function] Convert parameter format for hfcmgr.exe to hfcmputil.exe.
[Syntax]
hfcmig -old
[Example]

Sample of executing hfcmig –old

```
> hfcmig -old

Do you execute it? > y

Succeeded.
```

Backup parameters

[Function] Backup all HBA parameters set in running driver. This command stores both old and new format. Backup file is stored in the same directory as other utility programs.
[Syntax]
hfcmig -backup
[Example]

Sample of executing hfcmig –backup

```
> hfcmig -backup

Do you execute it? > y

Succeeded.
```

Restore parameters

[Function] Extract HBA parameters from backup and restore these parameters to running driver. This command restores both old and new format.
[Syntax]
hfcmig –restore <Backup file name>

[Example]

Sample of executing hfcmig -restore

```
> hfcmig -restore .\mig_20090921211545.bk

Do you execute it? > y

Succeeded.
```

Delete all parameters

[Function] Delete all HBA parameters set in running driver.
[Syntax]
hfcmig –reset

[Example]

Sample of executing hfcmig –reset

```
> hfcmig -reset

Do you execute it? > y

Succeeded.
```

Delete ConnectionType or LinkSpeed parameter

[Function] Delete only ConnectionType and LinkSpeed parameter set in running driver.
[Syntax]
hfcmig –clear

[Example]

Sample of executing hfcmig –clear

```
> hfcmig -clear

Do you execute it? > y

Succeeded.
Please set the HBA Parameters(ConnectionType, LinkSpeed) with the
following commands.
"hfcmgr -p scsiX ct <Topology>"
"hfcmgr -p scsiX sp <Speed>"
```

(*1) After executing ‘hfcmig –clear’, set ConnectionType and LinkSpeed again.

List of the Response Messages of hfcmig

List of the Response Messages of hfcmig

No.	Response Message	Description
1	Succeeded.	Successfully terminated
2	Command syntax error.	Command syntax error Check the syntax.
3	Registry operation is failed.	Failed to handle registry. Retry command again.
4	File operation is failed.	Failed to handle file. Retry command again.
5	No such file.	Specified file is not found. Check if the file exists.
6	Designated file isn't backup file.	Specified file is not the backup file. Specify correct backup file.
7	The number of Adapter must be 32 or less.	Adapter WWPN is registered over the limit. Delete unnecessary WWPN using ‘hfcmgr –ex’
8	Registry key don't integrate.	Both old and new parameter format is existed. Delete all setting using `hfcmig –reset`
9	Other error.	None of the above error occurred.

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Driver parameters

These parameters can be set by hfcmgr or hfcmputil.
The symbols such as “[Windows only]”, “[Linux only]” or “[RHEL5 or 6 only]” indicate that the parameter is only available for the Operating System.

q hfcmgr higher than or equal to version 8.0

This section refers to the hfcmgr version higher than or equal to 8.0. For hfcmgr version lower than 8.0, please refer to p156. hfcmgr version can be checked by executing a command, “hfcmgr -g”. For details, refer to “Display General Information” section. If this manual is available on online, it is easy to 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]

<table>
<tr><td>Displayed entry (Specified parameter)
Description</td></tr>
<tr><td>Connection Type (-p ct)
Specify the connection type of a FC path between Hitachi Fibre Channel Adapter and the device attached to it. If “auto” is specified, 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, this parameter does not need to be changed manually.
If LPAR manager is installed and LPAR is used on it, this parameter cannot be changed in the guest OS. Refer to HVM section in Hitachi Compute Blade User’s Guide for details.
Refer to the table below for the descriptions of the displayed values.
<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>
</td></tr>
<tr><td>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 Fibre Channel Adapter User’s Guide (BIOS/EFI edition).</td></tr>
<tr><td>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 “auto” is specified, this product negotiates with the device connected to it and automatically sets the link speed to a suitable value, depending on the situations. Usually, this parameter does not need to be changed manually.
If LPAR manager is installed and LPAR is used on it, this parameter cannot be changed in the guest OS. Refer to HVM section in Hitachi Compute Blade User’s Guide for details.</td></tr>
</table>

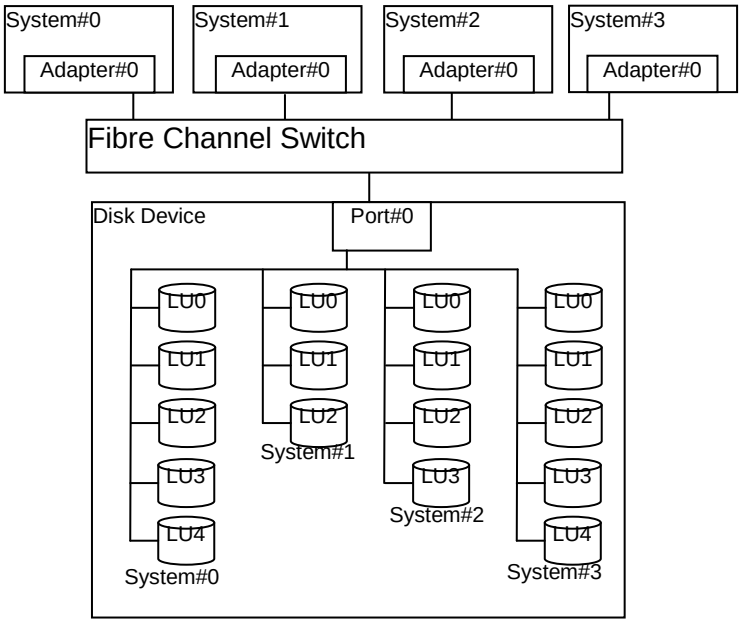
Login Delay Time (-p lo)
In case it takes a long time to log into the target device, a larger delay time can be set to the adapter port by using this parameter. If LPAR manager is installed and LPAR is used on it, this parameter cannot be changed in the guest OS. Refer to HVM section in Hitachi Compute Blade User's Guide for details.
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 this parameter does not need to be changed. Even if the value is increased and 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 this parameter does not need to be changed.
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 this parameter does not need to be changed. In Windows 2012 and Windows 2012 R2, the driver ignores this parameter and behaves as if it is set to 0 second.
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 0 is set 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 this parameter does not need to be changed.
Preferred AL-PA Number (-p pa) *Displayed as "Preferred AL-PA"
If AL (Arbitrated Loop) connection type is set on a FC path between Hitachi Fibre Channel Adapter and the device attached to it, the driver uses this parameter as preferred ALPA (Arbitrated Loop Physical Address) on loop initialization phase. The parameter is set to the optimum value for a general purpose, so usually this parameter does not need to be changed.
Reset Timeout (-p rt) [Linux only]
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 this parameter does not need to be changed.
Abort Timeout (-p at) [Linux only]
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 this parameter does not need to be changed.
Abort Restrain (-p ar) [Linux only]
Inhibit issuing Abort Task Set command. Usually, this parameter does not need to be changed.
Allowed (-p al) [Linux only]
This parameter specifies the minimum permissive retry number of a SCSI command. The parameter is available on disk devices, but ignored on tape devices.
Target Reset Mode (-p tr) [RHEL5 only]
This parameter specifies whether the driver executes Target Reset command to the device or not. The parameter is set to the optimum value for a general purpose, so usually this parameter does not need to be changed.
LUN Reset Delay Timer (-p lt) [Linux only]
This parameter specifies the time before processing the next SCSI command after a reset (LUN Reset, etc.) command succeeded. The parameter is set to the optimum value for a general purpose, so usually this parameter does not need to be changed.
Scatter/Gather List (-p sc) [Windows only]
This parameter specifies the number of memory lists per IO command, for all devices. The parameter is set to the optimum value for a general purpose, so usually this parameter does not need to be changed.

MSCS Mode (-p ms) [Windows only]

If Microsoft Cluster Service (MSCS) on Windows Server 2003 is used, enable this parameter. If JP1/HiCommand Dynamic Link Manager Software (HDLM) is insalled, or Windows Server 2008 is used, this parameter is not necessary.
The parameter is set to the optimum value for a general purpose, so usually this parameter does not need to be changed.

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 17 LUs are used 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.
The maximum number of the I/O available for queuing per LU is calculated with the following formula:
(Max. value of the I/O queuing number)÷(Number of LUs connected)
In this situation: 512 ÷ 17 = 30.11… Therefore, 30 or lower value should be set to this parameter.



Interrupt Type (-p ir) [Linux only]

This parameter specifies interrupt mode. The parameter is set to the optimum value for a general purpose, so usually this parameter does not need to be changed.
In Windows, this parameter cannot be set. In Windows Server 2008 R2 or lower Windows version, the driver runs with INT, and in Windows Server 2012 and Windows Server 2012 R2, the driver runs with MSI-X.

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

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

<Notice: when logical device name is used>
If 2G/4G/8G Fibre Channel Adapters is used and a logical device name is specified, all ports on the Fibre Channel Adapter that contains the logical device is set to use the specified value. If 16G Fibre Channel Adapter is used, only specified device is set to use the specified value..

Logging Mode (-p lm)

If FC-Switch is used and its ports are not separated into zones, for example, Access Gateway mode of the FC-switch is used, 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 this option is disabled, 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 the FC-Switch.
If “verbose” is set to this parameter on a 16G Adapters, the driver rejects unsupported FC protocol frames or supported FC protocol frames with some errors and logs errors as 0xDC. If 16G adapter is not used, the driver recognizes this parameter as a default.

Login Target Filter (-p tf)

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.
In virtual fibre channel with Windows Server 2012 and Windows Server 2012 R2 Hyper-V environment (by configuring 'hfcmgr -p npiv enable' command), default value is pid.

Notice: If this feature is enabled, refer to the following information.
• Depending on the configuration of the FC-Switch, upper 2 bytes of a target port and a host port may corresponds 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. After the configuration is finished, execute a Target Scan command, and re-recognize the target.
• If 16G Fibre Channel Adapter is used, this option does not make any effects. If 16G Fibre Channel Adapters are needed to be configured, refer to the “Login Target Filter 16G (-p tfx)” entry.

Login Target Filter (for 16G Fibre Channel Adapter) (-p tfx)
*Displayed as “Login Target Filter 16G

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 connected FC-Switch.

Notice the following information when this feature is enabled.
• Depending on the configuration of the FC-Switch, upper 2 bytes of a target port and a host port may corresponds to each other unintentionally. In such circumstances, log in to the target may fail. In such situation, disable this option to “none”, or reconfigure upper 2 byte of the PORT IDs on the FC-Switch not to correspond to each other. After the configuration is finished, execute a Target Scan command, and re-recognize the target.
• If 2G, 4G, or 8G Fibre Channel Adapter is used, this option does not make any effects. If 16G Fibre Channel Adapters are needed to be configured, refer to the “Login Target Filter (-p tf)” entry.

Performance Option (-p perf) [Windows only]

This parameter improves IO handling performance (IOPS) on degradation caused by the situation that multiple contiguous requests are stacked onto the driver. There are a few cases that this option does not improve performance of the system, depending on the environment or I/O characteristics.
In Windows 2003, the value of perf option cannot be set, and the driver always runs with disable.
In Windows 2008 and Windows 2008 R2, the value of perf option can be set.
In Windows 2012 and Windows 2012 R2, the value of perf option cannot be set, and the driver always runs with enable.

N_Port_ID Virtualization (-p npiv)

This parameter enables a virtual fibre channel feature with Windows Server 2012, Server 2012 R2 Hyper-V and RHEL KVM environment.
After enabling this parameter and executing 'hfcmgr -p <Device>' command, occasionally a message 'NPIV: not work (-)' is displayed. It means that the virtual fibre channel feature does not work for some reasons, such as the adapter port is linked down or the adapter port is connected directly to the disk device without FC switch.

NPIV vport count (-p vp)

This parameter specifies the maximum available number of virtual ports. The value is effective when the virtual fibre channel feature is enabled on Windows Server 2012, Server 2012 R2 Hyper-V or RHEL KVM. 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 this parameter does not need to be changed. 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.
The driver makes the HBA port offline immediately and returns all I/Os received after the reset as I/O Error.
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 this parameter is set to “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) [Linux only]

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 this parameter does not need to be changed. 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 [Linux only]	Count command numbers on each core’s response waiting queue and choose the least core to issue a new command.
round robin [Windows only]	Round-robin scheduling by the core number.
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.
cpun [Linux only]	Choose a core by the CPU number that issued the I/O command.

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. The interval of I/O completing interruption 【can be】 specified to this parameter. This parameter can be set only with 16G Fibre Channel Adapters. <Notice: when logical device name is used> If a logical device name is specified, all ports on the Fibre Channel Adapter that contains the logical device is set to use the specified value.
Exchange per Core (-p ioex)	
	This parameter specifies the amount of resource used by the Firmware on the Adapter. There are some cases when smaller value is set to this parameter and better performance can be got. This parameter can be set only with 16G Fibre Channel Adapters.
Additional Performance Monitor (-p pm)	
	Start or Stop gathering statistical informations to display I/O Processing Time of the Performance Monitor feature. If I/O Processing Time is displayed with this parameter off, then valid informations is not displayed. This parameter can be set only with 16G Fibre Channel Adapters.
Concurrent Channels (-p cch) [Windows only]	
	This parameter specifies the concurrency that the parallel number of SCSI commands to execute in the OS. This parameter can be set only with 16G Fibre Channel Adapters and Windows higher than or equal to Windows 2012.

[Notes]

(1) If the parameter values was changed using the utility software, the new parameter value should be activated to the Adapter. The procedures are different depending on the OS type and the changed parameters.
If the parameters which do not support dynamic parameter activation is changed, then the OS should be rebooted. As for the parameters that support dynamic parameter activation, the OS is not needed to reboot.
If Linux is used and the parameters stored in /etc/hfcldd.conf is changed, then the RAMDISK image should be updated. For details, refer to the section "Updating RAMDISK Image [Linux only]". If the OS is rebooted without updating the RAMDISK image, the OS do not activate the changed parameters after the reboot. If Windows is used or the parameters stored in /etc/hfcldd.conf are not changed, the RAMDISK image does not needed to be updated.
If the specified parameter value or the activated parameter value are needed, refer to the section " Display or Set the Port Information " for details.

(2) If both types of parameters, general to all ports and port-specific one, are stored in the /etc/hfcldd.conf in Linux or the registry in Windows, the driver uses port-specific parameter value. Parameter values general to all ports are configured when the command-line parameter '-p all' to hfcmgr command is specified, or the entries in the menu "Set parameters to All Adapters" of hfcddutil commands is changed.
As for the parameters stored in FLASH-ROM, the values finally stored in the FLASH-ROM is used.

(3) When the parameters stored in FLASH-ROM is chaned, 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) If the adapter port is used as FC shared mode, the following settings have to be applied.
① If the port is connected to the FC switch, set Connection Type 'Point to Point'.
② If the port is connected to the disk device directly, set Connection Type 'FC-AL'.

(5) If the FC extension card is mounted on Hitachi Compute Blade 320, the parameter value 'auto' should not be set to the Link Speed parameter and a fixed value has to be set. Refer to 'Hitachi Compute Blade 320 User's Guide' - 'FC HBA BIOS' for details.

(6) Notes on setting interrupt type. [Linux]
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 Interrupt Type is chenged, 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 both 4Gbs Fibre Channel Adapter and 8Gbps Fibre Channel Adapter are used on a system and MSI-X interrupt type is specified 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.

(7) 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.

#	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

For information of Model Name, refer to "Gigabit Fibre Channel Adapter User's Guide (Support Matrix Edition)".

q hfcmgr lower than version 8.0

This section refers to the hfcmgr version eariler than 8.0. For hfcmgr version higher than or equal to 8.0, please refer to p148. hfcmgr version can be checked by executing a command, “hfcmgr -g”. For details, refer to “Display General Information” section.

[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 “auto” is specified, 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, this parameter does not need to be changed manually.
If LPAR manager is installed and LPAR is used on it, this parameter cannot be changed in the guest OS. Refer to HVM section in Hitachi Compute Blade User ’ s Guide for details.

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

Displayed value	Description
Point to Point[fabric]	Point to Point (FC-SW Connection)
Point to Point	Point to Point (Direct Connection)
FC-AL[fabric]	Fibre Channel Arbitrated Loop (FC-SW Connection)
FC-AL	Fibre Channel Arbitrated Loop (Direct Connection)

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.

<Specified Parameter>	<Link Speed>
1	1Gbps
2	2Gbps
4	4Gbps
8	8Gbps

If “auto” is specified, this product negotiates with the device connected to it and automatically sets the link speed to a suitable value, depending on the situations. Usually, this parameter does not need to be changed manually.
If LPAR manager is installed and LPAR is used on it, this parameter cannot be set in the guest OS. Refer to HVM section in Hitachi Compute Blade User’s Guide for details..

Login Delay Time (-p lo)

In case it takes a long time to log into the target device, a larger delay time can be set to the adapter port by using this parameter.
If LPAR manager is installed and LPAR is used on it, this parameter cannot be set in the guest OS. Refer to HVM section in Hitachi Compute Blade User’s Guide for details.

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 this parameter does not need to be changed.
Even if the value is increased and 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 this parameter does not need to be changed.

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 this parameter does not need to be changed. In Windows 2012 and Windows 2012 R2, the driver ignores this parameter and behaves as if it is set to 0 second.

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 0 is set 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 this parameter does not need to be changed.

Preferred AL-PA Number (-p pa) *Displayed as “Preferred AL-PA”

If AL (Arbitrated Loop) connection type is set on a FC path between Hitachi Fibre Channel Adapter and the device attached to it, the driver uses this parameter as preferred ALPA (Arbitrated Loop Physical Address) on loop initialization phase. The parameter is set to the optimum value for a general purpose, so usually this parameter does not need to be changed.

Reset Timeout (-p rt) [Linux only]

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 this parameter does not need to be changed.

Abort Timeout (-p at) [Linux only]

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 this parameter does not need to be changed.

Abort Restrain (-p ar) [Linux only]

Inhibit issuing Abort Task Set command. Usually, this parameter not need to be changed.

Allowed (-p al) [Linux only]

This parameter specifies the minimum permissive retry number of a SCSI command. The parameter is available on disk devices, but ignored on tape devices.

Target Reset Mode (-p tr) [RHEL5 only]

This parameter specifies whether the driver executes Target Reset command to the device or not.
The parameter is set to the optimum value for a general purpose, so usually this parameter does not need to be changed.

LUN Reset Delay Timer (-p lt) [Linux only]

This parameter specifies the time before processing the next SCSI command after a reset (LUN Reset, etc.) command succeeded.
The parameter is set to the optimum value for a general purpose, so usually this parameter does not need to be changed.

Scatter/Gather List (-p sc) [Windows only]

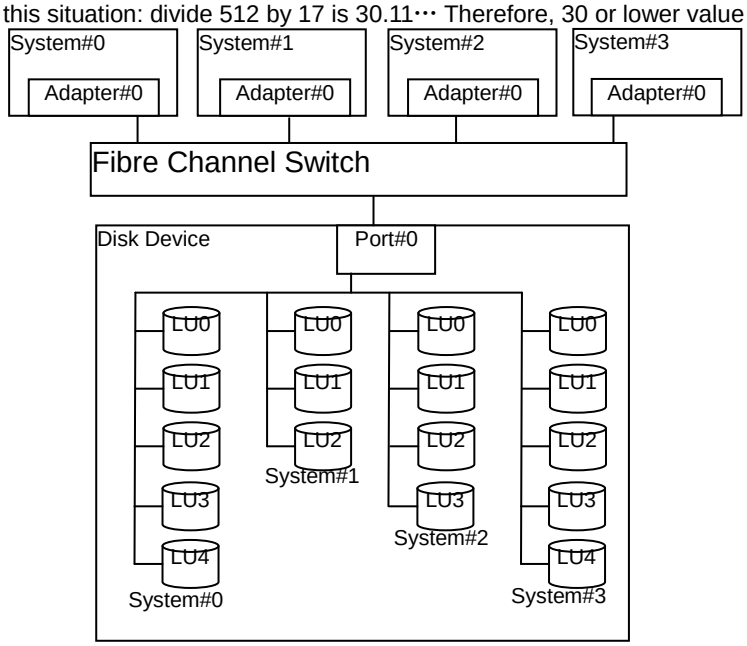
This parameter specifies the number of memory lists per IO command, for all devices.
The parameter is set to the optimum value for a general purpose, so usually this parameter does not need to be changed.

MSCS Mode (-p ms) [Windows only]

If Microsoft Cluster Service (MSCS) is used on Windows Server 2003, enable this parameter. If JP1/HiCommand Dynamic Link Manager Software (HDLM) is installed, or Windows Server 2008 is used, this parameter is not necessary.

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 17 LUs are used on a target device and the device has a port that can queue maximum 512 commands per second, and 4 systems are using the device. See the figure below.
The maximum number of the I/O available for queuing per LU is calculated with the following formula:
(Max. value of the I/O queuing number) ÷(Number of LUs connected)
In this situation: divide 512 by 17 is 30.11… Therefore, 30 or lower value should be set to this parameter.



Interrupt Type (-p ir) [Linux only]

This parameter specifies interrupt mode. The parameter is set to the optimum value for a general purpose, so usually this parameter does not need to be changed.
In Windows, this parameter cannot be set. In Windows Server 2008 R2 or lower Windows version, the driver runs with INT, and in Windows Server 2012 and Windows Server 2012 R2, the driver runs with MSI-X.

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

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

<Notice: when logical device name is used>
If 2G/4G/8G Fibre Channel Adapters is used and a logical device name is specified, all ports on the Fibre Channel Adapter that contains the logical device is set to use the specified value. If 16G Fibre Channel Adapter is used, only specified device is set to use the specified value.

Logging Mode (-p lm)

If the FC-Switch is used and do not separate its ports into zones, for example, Access Gateway mode of the FC-switch is used, 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 this option is disabled, the driver does not log when accessing the other port. However, this option makes the driver not 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 the FC-Switch.
If “verbose” is set to this parameter on a 16G Adapters, the driver rejects unsupported FC protocol frames or supported FC protocol frames with some errors and logs errors as 0xDC. If 16G adapter is not used, the driver recognizes this parameter as a default.

Login Target Filter (-p tf)

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 connected FC-Switch.
In virtual fibre channel with Windows Server 2012 and Windows Server 2012 R2 Hyper-V environment (by configuring 'hfcmgr -p npiv enable' command), default value is pid.

Notice the following information when if this feature is enabled:
• Depending on the configuration of the FC-Switch, upper 2 bytes of a target port and a host port may corresponds to each other unintentionally. In such circumstances, log in to the target may fail. In such situation, disable this option to “none”, or reconfigure upper 2 byte of the PORT IDs on the FC-Switch not to correspond to each other. After the configuration is finished, execute a Target Scan command, and re-recognize the target.

Performance Option (-p perf) [Windows only]

This parameter improves IO handling performance (IOPS) on degradation caused by the situation that multiple contiguous requests are stacked onto the driver. There are a few cases that this option does not improve performance of the system, depending on the environment or I/O characteristics.
In Windows 2003, the value of perf option cannot be set, and the driver always runs with disable.
In Windows 2008 and Windows 2008 R2, the value of perf option can be set.
In Windows 2012 and Windows 2012 R2, the value of perf option cannot be set, and the driver always runs with enable.

N_Port_ID Virtualization (-p npiv) [Windows only]

This parameter enables a virtual fibre channel feature with Windows Server 2012, Server 2012 R2 Hyper-V environment.
After enabling this parameter and executing 'hfcmgr -p <Device>' command, occasionally a message 'NPIV: not work (-)' is displayed. It means that the virtual fibre channel feature does not work for some reasons, such as the adapter port is linked down or the adapter port is connected directly to the disk device without FC switch.

[Notes]

(1) The new parameter settings is needed to be activated after executing the utility software. The procedure depends on OS type and parameters.

    [Windows] The system is needed to be rebooted after some parameter values is modified, in order to activate the new settings.

    [Linux]

    - The system has to be rebooted when Connection Type(ct)，Port Speed(sp) and Login Delay Time(lo) are changed.
    - The RAMDISK image is needed to update and rebooting the system if parameters except Connection Type(ct)，Port Speed(sp) and Login Delay Time(lo) are changed.
    - If the driver and utilities support Dynamic Parameter Activation feature and this feature supports the changed parameters, the parameters are can be activated temporarily without reboot. However, to use the newly configured parameter continuously after reboot, the RAMDISK image has to be updated to change this parameter permanently.
    - If the specified parameter value or the activated parameter value is needed to check, refer to the section “Display or Set the Port Information” for details.

(2) If both types of parameters, general to all ports and port-specific one, are stored in the /etc/hfcldd.conf in Linux or the registry in Windows, the driver uses port-specific parameter value. Parameter values general to all ports are configured when the command-line parameter ‘-p all’is specified to hfcmgr command, or the entries is changed in the menu “Set parameters to All Adapters” of hfcddutil commands.

(3) When parameter values of “Connection Type (ct)”, “Port Speed (sp)” or “Login Delay Time (lo)” are changed, these values are stored in the FLASH-ROM on the Adapter. Therefore, 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 the failure of the Hitachi Gigabit Fibre Channel Adapter.

(4) If the adapter port is used as FC shared mode, the following settings have to be applied.
    ① If the port is connected to the FC switch, set Connection Type ‘Point to Point’.
    ② If the port is connected to the disk device directly, set Connection Type ‘FC-AL’.

(5) If the FC extension card is mounted on Hitachi Compute Blade 320, the parameter value ‘auto’ should not be set to the Link Speed parameter and a fixed value has to be set. Refer to ‘Hitachi Compute Blade 320 User’s Guide’ - ‘FC HBA BIOS’ for details.

(6) Notes on setting interrupt type. [Linux]
    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 Interrupt Type is changed, 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 both 4Gbs Fibre Channel Adapter and 8Gbps Fibre Channel Adapter are used on a system and MSI-X interrupt type is specified 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.

(7) 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.

#	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

For information of Model Name, refer to "Gigabit Fibre Channel Adapter User's Guide (Support Matrix Edition)".

HITACHI
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(Utility Software Edition)

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