

C122-E189-02EN

# **PRIMEQUEST 2000 Series**

**HBA blockage function**

**USER'S GUIDE**

## **FOR SAFE OPERATION**

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## Revision History

(1/1)

[illegible]

\*1 Section(s) with asterisk (\*) refer to the previous edition when those were deleted.



# Preface

## Purpose of This Manual

This manual describes the functions and installation methods of HBA blockage driver supplied with the PRIMEQUEST-series machine.

## Intended Readers

This manual is intended for system administrators responsible for system installation and operation.

## Structure and Contents of This Manual

This manual is organized as described below:

### **Chapter 1 HBA Blockage Function**

Provides an overview of the HBA blockage function and describes how to install and basically use this function.

### **Appendix A Command Reference**

Explains usage of the HBA blockage command.

### **Appendix B Messages**

Contains messages that are output by HBA blockage driver and command, explains the messages, and describes the appropriate actions to be taken.

## Abbreviations

The following abbreviations are used in this manual:

Full Name	Abbreviation
Red Hat Enterprise Linux 6 (for Intel64)	RHEL6
Red Hat Enterprise Linux 7 (for Intel64)	RHEL7

## Other Reference Manuals

The following manuals are provided for reference:

- *PRIMEQUEST 2000 Series General Description*
- *PRIMEQUEST 2000 Series Installation Manual*
- *PRIMEQUEST 2000 Series User Interface Operating Instructions*
- *PRIMEQUEST 2000 Series Administration Manual*
- *PRIMEQUEST 2000 Series Tool Reference*
- *PRIMEQUEST 2000 Series Message Reference*
- *PRIMEQUEST 2000 Series Glossary*
- *PRIMEQUEST 2000 Series ServerView Mission Critical Option User Manual*

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# CHAPTER 1 HBA Blockage Function

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This chapter provides an overview of the HBA blockage function and describes how to install and basically use this function.

## 1.1 Functional Overview

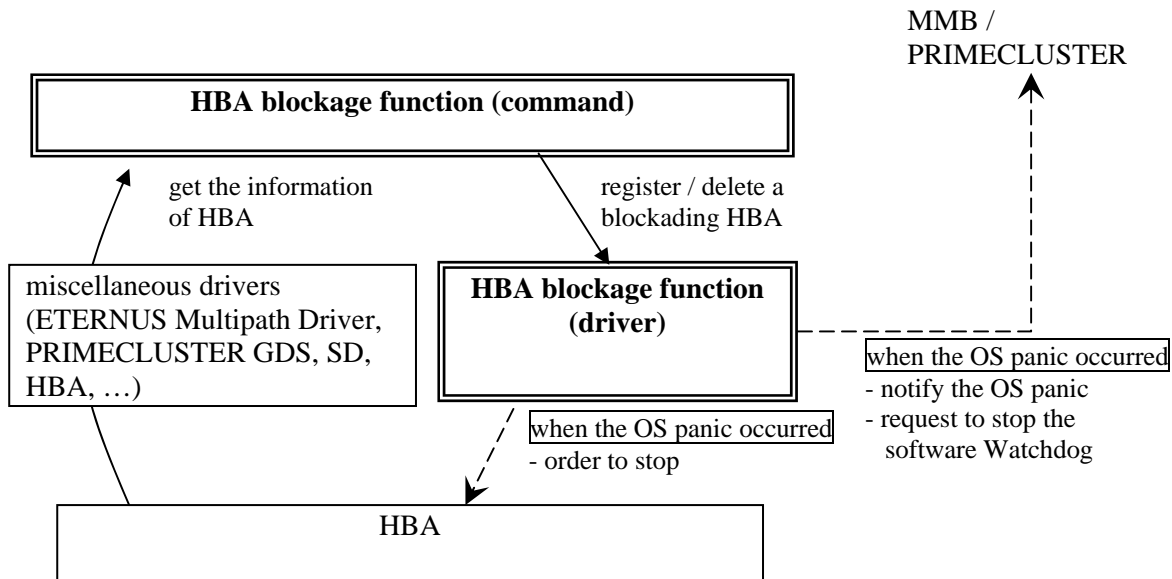
The HBA blockage function achieves the following functions when OS panic has occurred.

- Guarantee of node-switching time. (case with a cluster-system, powered by PRIMECLUSTER)
- Notification of OS panic event. (to MMB(management feature) )
- Stop request of software Watchdog. (to MMB)

When an OS panic occurs, the HBA Blockage Function cuts off the power supply of the HBAs which have been registered previously. Then, it blocks off all I/O requests to the disks which are connected with the HBAs. After that, the HBA Blockage Function informs MMB and PRIMECLUSTER of the panic occurrence and stops the watchdog timer. There is no negative effect on collecting a dump into ETERNUS or booting from ETERNUS because the power of the HBAs is resupplied immediately.

A cluster-system powered by PRIMECLUSTER, which utilizes these functions for guarantee of node-switching time. When the OS panic occurred in a clustering node, cluster-system recovers the cluster-services in a very short time by these functions. (This function gives priority to the switching node over the dump collections.)

Figure 1.1 shows the configuration of the HBA blockage function.



**Figure 1.1 Configuration of the HBA blockage function**

The HBA blockage function consists of command part package and driver part package.

Please install both packages. (You should install these packages even if your system is not a cluster-system, because of notifying the OS panic event to MMB.)

And, if your system is a cluster-system, please register a blockading HBA.

## 1.2 Installation Procedure

Please install the packages of command part and driver part.

[for RHEL6]

Command part: FJSVfefpcl-<OS version>-kmod-common-A.B.C-D.<arch>.rpm

Driver part: kmod-FJSVfefpcl-<OS version>-A.B.C-D.<arch>.rpm

[for RHEL7]

Command part: FJSVfefpcl-kmod-common-A.B.C-D.el7.<arch>.rpm

Driver part: kmod-FJSVfefpcl-A.B.C-D.el7.<arch>.rpm

kmod-FJSVpanicforpcl-A.B.C-D.el7.<arch>.rpm

FJSVpanicforpcl-A.B.C-D.el7.<arch>.rpm

FJSVkdump-post-wrapper-A.B.C-D.el7.<arch>.rpm

<OS version> is characters that show the OS version. (ex. RHEL6)

A.B.C describes a version of the packages, and D describes a release number of the packages. (ex. 4.2.0-1)

README file for further details.

<arch> is CPU architecture. (ex. x86\_64)

### 1.2.1 Packages required for HBA blockage function [for RHEL7]

The following table lists the packages required for HBA blockage function operation.

Please confirm that the packages have been installed on your system before installing HBA blockage function.

Packages
ipmitool-x.x.x-x.x.x86_64

### 1.2.2 Installation

1. Change to the super-user (root) privilege.

```
$ su
```

2. Install the rpm packages with the following command. They are upgraded if needed according to the situation:

```
# FJSVfefpcl/INSTALL.sh
```

3. Install SVMco.

If you have not automatically installed hardware bundled-software by using ServerView Installation Manager (SVIM), then please refer to "PRIMEQUEST 2000 Series ServerView Mission Critical Option User Manual" and install SVMco. If SVMco is already installed, you do not need to install SVMco.

4. Reboot the system.

If you want to install two or more numbers of drivers, you have to reboot the system after all the install for each driver finished.

```
# /sbin/shutdown -r now
```

### 1.2.3 Uninstallation

1. Change to the super-user (root) privilege.

```
$ su
```

2. Uninstall the rpm packages with the following command.

```
# FJSVfefpcl/UNINSTALL.sh
```

3. Reboot the system.

If you want to uninstall two or more numbers of drivers, you have to reboot the system after all the uninstall for each driver finished.

```
# /sbin/shutdown -r now
```

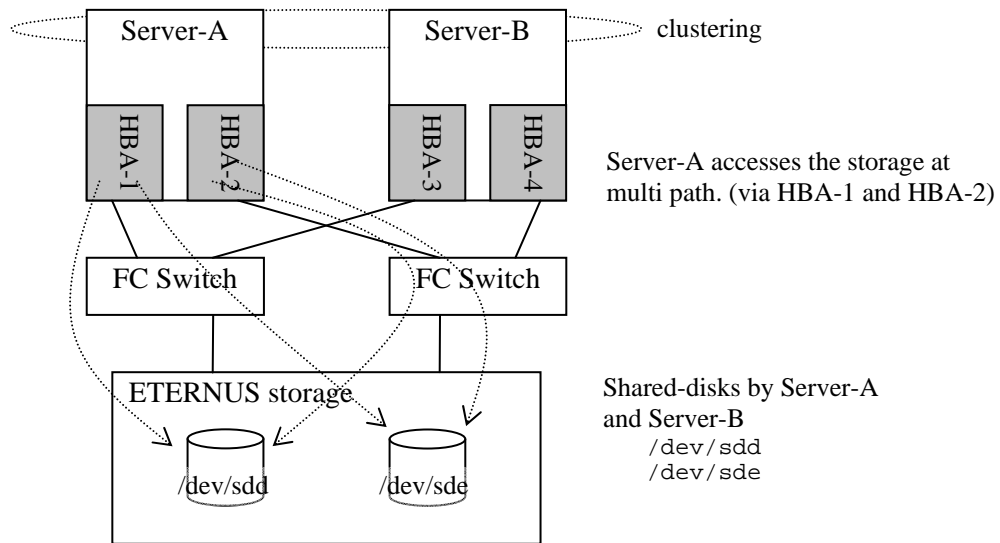
## 1.3 Register a blockading HBA

In a cluster-system powered by PRIMECLUSTER, you must register a blockading HBA beforehand. Please register the all HBA which used to access the shared-disks in the cluster-system.

If the software (ETERNUS Multipath Driver or GR Multipath Driver, PRIMECLUSTER GDS(Global Disk Services)) are worked in your system, you should finish the setting of these software. After that, you should execute this procedure.

You can register a blockading HBA by using the command (fefpcl -a). If you want to know more functions about fefpcl command, please refer to “Appendix A.1 HBA Blockage Function Command” of this manual.

**Example)**



This example shows the procedure for registration of HBA-1 and HBA-2 at Server-A.

You can register it by following command. This command argument is shared-disk (/dev/sdd) which is accessed by Server-A via HBA-1 and HBA-2.

```
# fefpctl -a /dev/sdd
```

After that, you can confirm the registration.

```
# fefpctl -l

/dev/sdd, /dev/sdd, grmpd 0000:ff:0a.0
/dev/sdd, /dev/sdd, grmpd 0000:ff:0b.0
```

\* Please execute this registration procedure at the all server-node which constructs the cluster-system.

\* If server works the software (ETERNUS Multipath Driver or GR Multipath Driver, PRIMECLUSTER GDS), two or more HBA may be registered to the server by specifying one shared-disk. (At this example, two HBA are registered by specifying one shared-disk.)

\* The command (fefpctl -l) shows a busID which is used as a key to identify HBA. You can confirm the number of registered HBA by counting the number of busID.

\* It is not necessary to register the all shared-disks (devices). It is enough that the all blockading HBA has registered.

\* It's not a problem even if you make duplicated definitions.

## 1.4 Change the blockading HBA

You can change the blockading HBA by using `fefpcl` command. If you want to know more functions about `fefpcl` command, please refer to “Appendix A.1 HBA Blockage Function Command” of this manual.

## 1.5 Notice

Notes the blockading HBA is used are show below.

### 1.5.1 Notes: Usage of dual channel HBA

The HBA Blockage Function controls a HBA each PCI cards. So, it treats a HBA with dual channel as well as single channel.

### 1.5.2 Notes: iSCSI is used to access the shared-disks

It is not necessary to register LAN card (LAN adaptor). Because all I/O requests have stopped completely when OS panic occurs.

### 1.5.3 Notes: concerning kdump service

[for RHEL6]

- `extra_modules` parameter can't be set in `/etc/kdump.conf`.
- If you started or restarted `kdump` service manually, you need to execute the following command successively, too.

```
# service y2lFJSVfefpcl-mkrd start
```

[for RHEL7]

- If you used `kdump` dump saving area connected to a blockading HBA, you need to add the following parameter to `KDUMP_COMMANDLINE_APPEND` in `/etc/sysconfig/kdump`.

```
KDUMP_COMMANDLINE_APPEND="... pcie_ports=native ..."
```

#### **1.5.4 Notes: concerning Dynamic Reconfiguration function**

- When HBA is increased by the Dynamic Reconfiguration function, it is necessary to register HBA of the correspondence as a blockage target.
- When HBA is reduced by the Dynamic Reconfiguration function, it is necessary to delete HBA of the correspondence from the blockage target.

### **1.6 Information for your support desk when trouble occurs**

When you request the detail examination in case of the HBA Blockage Function, please present the files in the following directories with fjsnap's output data. At that time, please don't remove it. (If you remove it, the HBA blockage Function may not work normally.)

- /etc/opt/FJSVfefpcl
- /var/opt/FJSVfefpcl
- The messages which was displayed on a console after a panic occurred.

# APPENDIX A Command Reference

## A.1 HBA Blockage Function Command

### Syntax

fefpcl -a device-path...

fefpcl -a class-name...

fefpcl -d label...

fefpcl -c old-label new-label

fefpcl -l | -r

### Functions

This command controls the HBA's list in the HBA Blockage Function. It can register, delete, and display HBAs from the list, and also change the label name.

HBAs are controlled by binding a label. The label is set to device-path or class-name as initial value, and can be customized by -c option arbitrarily.

If the software (ETERNUS Multipath Driver or GR Multipath Driver, PRIMECLUSTER GDS) will be worked in your system, you should finish the setting of this software. After that, you should execute this command.

### Options

-a Register blockading HBAs to the HBA's list

This option allows specifying a device-path and a class-name as arguments. When a device-path specified, HBAs consisting of access-path to the device-path are registered to the list. When a class-name specified, HBAs consisting of access-path to disk group named "class-name" are registered to the list. (class-name is a grouped name which is defined in PRIMECLUSTER GDS ).

You can specify multiple arguments at one time. It is not necessary to register all device-path and class-name.

Please specify device-path in the following formats:

- /dev/sdX (X represents a disk unit identifier (an alphabetic character))
- /dev/sfdsk/*class-name*/r}dsk/*volume-name* (using PRIMECLUSTER GDS)
- /dev/disk/by-id/*device-name* (a device of by-id form)



- `/dev/disk/by-path/device-name` (a device of by-path form)

\* Please do not specify device-path which indicates a disk partition. (ex. `/dev/sdb1`)

- d Delete blockading HBAs from the HBA's list

This option deletes HBAs binding by the label from the list. You can specify multiple arguments at one time.

- c Change the label from old-label to new-label.

You should use the following character to the new-label.

The first character	a-z A-Z 0-9 /
The other characters	a-z A-Z 0-9 / - _ . :

- l Display the current HBA's list

<i>label,physical-devp</i> [, <i>grmpd</i> ] <i>busID</i>
---

*label* : label name

*physical-devp* : the name of the physical device path of devp

[,*grmpd*] : state of use of the ETERNUS Multipath Driver  
(prints "grmpd" if the driver is being used)

*busID* : an ID to identify PCI bus  
(used as a key to identify HBA)

- r Maintenance option

This option is used under the maintenance mode.

## Note

At the following case, please re-register the blockading HBA.

- When the software (ETERNUS Multipath Driver or GR Multipath Driver, PRIMECLUSTER GDS) setting was changed.
- When a HBA was installed (or uninstalled) from the server by using PCI Hot Plug (PHP) or dynamic reconfiguration (DR).

## End status

On success, 0 is returned.

On error, not 0 is returned.

## **A.2 Initial ram disk image edit command for kdump [for RHEL6]**

### **Syntax**

```
service y21FJSVfefpcl-mkrd start
```

### **Functions**

This is the command to edit the initial ram disk image which is used by kdump service. Execute this command when you started or restarted kdump service manually.

### **Options**

start

edit the initial ram disk image

### **End status**

On success, 0 is returned.

On error, not 0 is returned.

## APPENDIX B Messages

B.1 fefpcl driver

B.2 fefpcl command

B.3 Initial ram disk image edit command for kdump

Appendix B contains messages that are output by the drivers and commands covered by this manual, explains the messages, and describes the appropriate actions to be taken.

### B.1 fefpcl driver

---

```
fefpcl: ERROR: could not register character device(%d).
```

Registration of the HBA blockage driver failed. Contact your support representative, and report the output message.

---

```
fefpcl: ERROR: could not register sysctl table.
```

Addition of the sysctl table for use by the HBA blockage driver failed. Contact your support representative, and report the output message.

---

```
fefpcl: ERROR: could not register callback function.
```

Registration of a callback function for use by the HBA blockage driver failed. Contact your support representative, and report the output message.

---

```
fefpcl: ERROR: callback function are overwritten(%p).
```

A callback function registered by the HBA blockage driver was overwritten. Contact your support representative, and report the output message.

---

```
fefpcl: ERROR: could not register entry point(%d).
```

An entry point that is necessary for the HBA blockage driver could not be registered. Contact your support representative, and report the output message.

---

**fefpcl: ERROR: could not %s config space %04x:%02x:%02x.%x(%x:%x).**

The PCI configuration space of the device mounted at %04x:%02x:%02x.%x cannot be accessed (access method: read or write). Contact your support representative, and report the output message.

---

**fefpcl: ERROR: could not read config space %04x:%02x:%02x.%x(%x).**

Data cannot be read from the PCI configuration space of the device mounted at %04x:%02x:%02x.%x. Contact your support representative, and report the output message.

---

**fefpcl: ERROR: could not write config space %04x:%02x:%02x.%x(%x).**

Data cannot be written to the PCI configuration space of the device mounted at %04x:%02x:%02x.%x. Contact your support representative, and report the output message.

---

**fefpcl: ERROR: could not enter D3 state %04x:%02x:%02x.%x(%x).**

The device that is mounted at %04x:%02x:%02x.%x cannot be placed in power management status D3. Contact your support representative, and report the output message.

---

**fefpcl: ERROR: could not enter D0 state %04x:%02x:%02x.%x(%x).**

The device that is mounted at %04x:%02x:%02x.%x cannot be placed in power management status D0. Contact your support representative, and report the output message.

---

**fefpcl: ERROR: command timeout %04x:%02x:%02x.%x(%x).**

A timeout occurred regarding a command issued to the device mounted at %04x:%02x:%02x.%x. Contact your support representative, and report the output message.

---

**fefpcl: ERROR: command error %04x:%02x:%02x.%x(%x).**

A command issued to the device mounted at %04x:%02x:%02x.%x ended with an error. Contact your support representative, and report the output message.

---

**fefpcl: ERROR: could not stop a device %04x:%02x:%02x.%x(%x).**

The function of the device mounted at %04x:%02x:%02x.%x cannot be stopped. Contact your support representative, and report the output message.

---

**fefpcl: ERROR: stop device processing failed(%x).**

Stop processing of the HBA function ended with an error. Contact your support representative, and report the output message.

---

**fefpcl: INFO: loading driver - version %s**

The HBA blockage driver was loaded. No corrective action is required.

---

**fefpcl: INFO: unloading driver - version %s**

The HBA blockage driver was unloaded. No corrective action is required.

---

**fefpcl: INFO: execute alternative method.**

The method used in stop processing of the HBA function was switched from operation with SHPC to operation with PCI PM. No corrective action is required.

---

**fefpcl: INFO: initialization for stop device processing - %s:%d**

Stop processing of the HBA function is being initialized. No corrective action is required.

---

**fefpcl: INFO: stop device processing begins.**

Stop processing of the HBA function started. No corrective action is required.

---

**fefpcl: INFO: stop device processing is completed.**

Stop processing of the HBA function is completed. No corrective action is required.

---

**fefpcl: INFO: call psa function.**

A PSA function was called. No corrective action is required.

---

**fefpcl: INFO: stop device processing success.**

Stop processing of the HBA function completed normally. No corrective action is required.

---

**Psa\_add\_driver\_to\_ipmi Start**

**Psa\_add\_driver\_to\_ipmi Ret1**

This message is displayed when HBA Blockage Function started. No action is required.

---

**fefpcl I IP8150 sadump not exist**

This message is displayed when sadump service is not started.

---

**panicforpcl: ver. 1.0.0 initialize failed.**

Loading panicforpcl that is the part of the fefpcl feature. Address the problem that is indicated by the messages that follows this message.

---

**panicforpcl: create /proc/<filename> failed.**

[Only RHEL6]

Creating /proc/<filename> failed. Confirm if the system memory is enough for the operation. If the memory is enough, contact your support representative with the output message and any other data for investigation.

---

**panicforpcl: Sending ipmi message failed.**

[Only RHEL6]

Issuing the IPMI message failed. Contact your support representative with the output message and any other data for investigation.

---

**panicforpcl: IPMI code=XX, message.**

[Only RHEL6]

Issuing the IPMI message failed. Contact your support representative with the output message and any other data for investigation.

---

**panicforpcl: ver. 1.0.0 initialized.**

panicforpcl that is the part of the fefpcl feature has been loaded. No corrective action is required.

---

**panicforpcl: ver. 1.0.0 removed.**

panicforpcl that is the part of the fefpcl feature has been unloaded. No corrective action is required.

---

---

**panicforpcl: Node Busy. Command could not be processed because  
command processing resources are temporarily unavailable.**

[Only RHEL6]

If this message is output at the time of starting up of the FJSVfefpcl service, restart the service. If the same message is output again, or the message is output in any other case, contact your support representative with the output message and any other data for investigation.

---

**panicforpcl: loading module-name failed.**

[Only RHEL6]

Loading panicforpcl that is the part of the fefpcl feature failed. Confirm if the system install disk has any problem. If not, contact your support representative with the output message and any other data for investigation.

---

**panicforpcl: Setting system status to dumping succeeded.**

[Only RHEL6]

The status of the partition has been switched to "Dumping". No corrective action is required.

---

**panicforpcl: Setting system status to halt succeeded.**

[Only RHEL6]

The status of the partition has been switched to "Halt". No corrective action is required.

---

**panicforpcl: Setting ipmi message succeeded.**

[Only RHEL6]

Sending the IPMI message succeeded. No corrective action is required.

---

**panicforpcl: Sending ipmi message failed.**

[Only RHEL6]

Sending the IPMI message failed. Address the issue with the description that is output with this message.

---

`panicforpcl: Setting system status to halt succeeded.`

`panicforpcl: SPMI(f0902000): IPMI: Bad SPMI legacy 0`

`panicforpcl: SPMI: Could not get SPMI table with ACPI`

`panicforpcl: Please wait for a few seconds.`

`Loading panicforpcl.ko module`

`panicforpcl: Setting system status to dumping.`

`panicforpcl: cannot get fefpcl_hook symbol.`

[Only RHEL6]

These messages are printed by the HBA blockage feature while kdump is running.  
No corrective action is required.

---

`INFO: panicforpcl is already starting.`

[Only RHEL6]

The FJSVfefpcl service has already been started. No corrective action is required.

---

`ERROR: modprobe ipmi failed.`

[Only RHEL6]

Loading the IPMI driver failed. Confirm if the system install disk has any problem.  
If not, contact your support representative with the output message and any other data for investigation.

---

`ERROR: modprobe panicforpcl failed.`

[Only RHEL6]

Loading panicforpcl that is the part of the fefpcl feature failed. Confirm if the system install disk has any problem. If not, contact your support representative with the output message and any other data for investigation.

---

`ERROR: kdump.conf is not found.`

The kdump.conf file is not found. Set up the kdump feature correctly and restart the FJSVfefpcl service.



---

**INFO: panicforpcl started.**

[Only RHEL6]

The message is output when the FJSVfefpcl service has been started properly. No corrective action is required.

---

**INFO: panicforpcl is already stopping.**

[Only RHEL6]

The FJSVfefpcl service has already been stopped. No corrective action is required.

---

**ERROR: rmmmod panicforpcl failed.**

[Only RHEL6]

Unloading panicforpcl that is the part of the fepcl feature failed. If the module has not already been unloaded, contact your support representative with the output message and any other data for investigation.

---

**INFO: FJSVfefpcl stopped.**

The FJSVfefpcl service has stopped properly. No corrective action is required.

---

## B.2 fefpcl command

---

**ERROR: must run as root.**

The root privilege is required for execution. Execute the command with the root privilege (superuser privilege).

---

**ERROR: initialization failed(%x).**

Initialization of the HBA blockage driver application failed. Contact your support representative, and report the output message.

---

**ERROR: unknown option -%c.**

The specified option contains an error. Specify a supported option.

---

**ERROR: unknown option character 0x%x.**

The specified option contains an error. Specify a supported option.

---

**ERROR: usage: fefpcl -a DEVICE-PATH**

**ERROR: or: fefpcl -d LABEL**

**ERROR: or: fefpcl -c OLD-LABEL NEW-LABEL**

**ERROR: or: fefpcl -l | -r**

Show usage. Execute command according to this usage.

---

**ERROR: invalid character used in NEW-LABEL.**

**ERROR: the first character is a-z A-Z 0-9 /**

**ERROR: the other characters are a-z A-Z 0-9 / - \_ . :**

Invalid character used in NEW-LABEL. Specify this character.

---

**ERROR: illegal device-path %s.**

Specified illegal device-path. Specify device-path according to the format.

---

**ERROR: illegal class-name %s.**

Specified illegal class-path. Or, PRIMECLUSTER GDS is not installed. Specify a correct class-name.

---

**ERROR: label %s is not found.**

Label is not found in the blockading HBA list. Specify the label from the blockading HBA list.

---

**ERROR: lack of resources(%x:%x).**

There is a shortage of resources. Re-execute the same command later. If the same message is output, contact your support representative, and report the output message.

---

**ERROR: %s: an input/output error has occurred(%x:%x).**

If you found out the message in executing the "fefpcl -a device-path", it seems that the device-path is under the PRIMECLUSTER GDS. Please specify the device-path or class-name defined on the PRIMECLUSTER GDS.

If this is not the case, an I/O error had occurred. Please contact your support representative, and report the output message.

---

**ERROR: %s: failed to access file(%x:%x).**

An error was detected during file access. Contact your support representative, and report the output message.

---

**ERROR: there was a fatal error(%x).**

A fatal error was detected. Contact your support representative, and report the output message.

---

**ERROR: failed to get a busID(%x).**

**ERROR: please refer to the manual for more information.**

Failed to get a busID.

When iSCSI is used to access the shared-disks, it is not necessary to register LAN card (LAN adaptor). For further information, please refer to "1.5.2 Notes: When iSCSI is used to access the shared-disks" of this manual.

---

## B.3 Initial ram disk image edit command for kdump [for RHEL6]

---

```
Starting y21FJSVfefpcl-mkrd:[ OK ]
```

```
y21FJSVfefpcl-mkrd: started up
```

```
y21FJSVfefpcl-mkrd: started up (already modified)
```

```
y21FJSVfefpcl-mkrd: started up (Kdump is not operational)
```

The edit command ended normally.

---

```
Starting y21FJSVfefpcl-mkrd:[ FAILED ]
```

The edit command ended abnormally. Follow the action of the message displayed just before this message.

---

```
y21FJSVfefpcl-mkrd: Module fjpeghp.ko not found.
```

```
y21FJSVfefpcl-mkrd: Module panicforpcl.ko not found.
```

The internal module of HBA Blockage Function (fjpeghp.ko or panicforpcl.ko) is not found. Collect the output message and the data for investigation and please contact Fujitsu certified service engineer.

---

```
y21FJSVfefpcl-mkrd: Not found kdump initrd.
```

The initial ram disk image for kdump is not found. Restart kdump service and execute the initial ram disk image edit command for kdump (y21FJSVfefpcl-mkrd). If this message is still displayed after executing the above command, collect the output message and the data for investigation and please contact Fujitsu certified service engineer.

---

```
y21FJSVfefpcl-mkrd: Cannot define extra_modules parameter in  
/etc/kdump.conf.
```

extra\_modules parameter can't be specified in /etc/kdump.conf. Execute the initial ram disk image edit command for kdump (y21FJSVfefpcl-mkrd) again after deleting extra\_modules from /etc/kdump.conf.

---

```
y21FJSVfefpcl-mkrd: No disk space. Please clean /tmp directory.
```

There are not enough areas used as work area in /tmp. Execute the initial ram disk image edit command for kdump (y21FJSVfefpcl-mkrd) again after extending /tmp.

---

**y21FJSVfefpcl-mkrd: Failed to restart the service of Kdump.**

Restarting kdump service failed. Execute the initial ram disk image edit command for kdump (y21FJSVfefpcl-mkrd) again after reviewing the service setting of kdump.

---



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