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PRIMEQUEST 3000 Series

HBA blockage function

USER'S GUIDE

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Revision History

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01	2017-04-20	—	—
02	2019-03-12	1.2 (Altered)	RHEL8 support.
03	2022-06-10	1.2.2 (Altered)	Article correction.
04	2022-06-20	1.2 (Altered)	RHEL9 support.

*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 7 (for Intel64)	RHEL7
Red Hat Enterprise Linux 8 (for Intel64)	RHEL8
Red Hat Enterprise Linux 9 (for Intel64)	RHEL9

Other Reference Manuals

The following manuals are provided for reference:

- *PRIMEQUEST 3000 Series General Description*
- *PRIMEQUEST 3000 Series Installation Manual*
- *PRIMEQUEST 3000 Series User Interface Operating Instructions*
- *PRIMEQUEST 3000 Series Administration Manual*
- *PRIMEQUEST 3000 Series Tool Reference*
- *PRIMEQUEST 3000 Series Message Reference*
- *PRIMEQUEST 3000 Series Glossary*

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CHAPTER 1 HBA Blockage Function

1.1 Functional Overview

1.2 Installation Procedure

1.3 Register a blockading HBA

1.4 Change the blockading HBA

1.5 Notice

1.6 Information for your support desk when trouble occurs

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 iRMC(management feature))
- Stop request of software Watchdog. (to iRMC)

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 iRMC 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 iRMC.)

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 RHEL7]

Command part: FJSVfefpcl-kmod-common-A.B.C-D.el7.x86_64.rpm

Driver part: kmod-FJSVfefpcl-A.B.C-D.el7. x86_64.rpm

kmod-FJSVossn-A.B.C-D.el7. x86_64.rpm

FJSVossn-A.B.C-D.el7. x86_64.rpm

FJSVossn-checkhssc-A.B.C-D.el7. x86_64.rpm

FJSVkdump-post-wrapper-A.B.C-D.el7. x86_64.rpm

[for RHEL8]

Command part: FJSVfefpcl-kmod-common-A.B.C-D.el8.x86_64.rpm

Driver part: kmod-FJSVfefpcl-A.B.C-D.el8. x86_64.rpm

kmod-FJSVossn-A.B.C-D.el8. x86_64.rpm

FJSVossn-A.B.C-D.el8. x86_64.rpm

FJSVossn-checkhssc-A.B.C-D.el8. x86_64.rpm

FJSVkdump-post-wrapper-A.B.C-D.el8. x86_64.rpm

[for RHEL9]

Command part: FJSVfefpcl-kmod-common-A.B.C-D.el9.x86_64.rpm

Driver part: kmod-FJSVfefpcl-A.B.C-D.el9. x86_64.rpm

kmod-FJSVossn-A.B.C-D.el9. x86_64.rpm

FJSVossn-A.B.C-D.el9. x86_64.rpm

FJSVossn-checkhssc-A.B.C-D.el9. x86_64.rpm

A.B.C describes a version of the packages, and D describes a release number of the packages. (ex. 6.0.0-1)

README file for further details.

1.2.1 Packages required for HBA blockage function

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
dmidecode-x.x-x.x.x86_64
initscripts-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. (RHEL8 only and version 7.0.0.1-3 or lower) Configure kernel boot parameter crash_kexec_post_notifiers.

   3.1 Back up /etc/default/grub file in a different file name before attempting to edit it.

   3.2 Edit /etc/default/grub file.
   Add crash_kexec_post_notifiers at the last position of line GRUB_CMDLINE_LINUX.

   Example:

   [Before]

```
GRUB_CMDLINE_LINUX="...”
```

   [After]

```
GRUB_CMDLINE_LINUX="... crash_kexec_post_notifiers”
```

   3.3 Reflect the previous configuration into grub.cfg file using grub2-mkconfig command.

   [UEFI mode]

```
# grub2-mkconfig -o /boot/efi/EFI/redhat/grub.cfg
```

   [BIOS mode]

```
# grub2-mkconfig -o /boot/grub2/grub.cfg
```

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.

```
# systemctl reboot
```

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.

```
# systemctl reboot
```

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.

```
# fefpcl -a /dev/sdd
```

After that, you can confirm the registration.

```
# fefpcl -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 (fefpcl -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

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 PRIMECLSTER 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/sd*X* (*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

label,*physical-devp*[,grmpd] *busID*

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.

APPENDIX B Messages

B.1 fefpcl driver

B.2 fefpcl command

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: 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.

`ossn_ipmi_mod: IPMI: Could not get IPMI interface.`

The IPMI module in the OS status notification driver failed to obtain IPMI interface. Contact your support representative, and report the output message.

`ossn_ipmi_mod: Start sadump command failed: %d.`

The IPMI module in the OS status notification driver failed to start sadump. Contact your support representative, and report the output message.

`ossn_ipmi_mod: Set Watchdog Timer command failed: %d.`

The IPMI module in the OS status notification driver failed to execute Set Watchdog Timer command. Contact your support representative, and report the output message.

`ossn: ver.%s initialize failed.`

The OS status notification driver failed to be loaded. 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.

`ossn: ver.%s initialize start.`

The OS status notification driver started to be loaded. No corrective action is required.

`ossn: ver.%s initialized.`

The OS status notification driver was loaded. No corrective action is required.

`ossn: ver.%s removed.`

The OS status notification driver was unloaded. No corrective action is required.

`ossn: failed to initialize ipmi module.`

The OS status notification driver failed to load the IPMI module. Contact your support representative, and report the output message.

`ossn: cannot get fefpcl_hook symbol.`

The OS status notification driver was tried to be loaded before the HBA blockage driver. Contact your support representative, and report the output message.

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.

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