FUJITSU

FUJITSU Server
PRIMEQUEST 2000 Series
Configuring the SAN Boot Environment

C122-E206-04EN

CHAPTER 1   Configuring the SAN Boot Environment

This chapter describes the procedure for installing the SAN boot environment and provides notes on design.

The chapter assumes that an ETERNUS model is used as the SAN storage unit.

⚠WARNING

Only field engineers should perform the following tasks on this product and the options provided by Fujitsu. Customers must not perform these tasks under any circumstances. Otherwise, electric shock, injury, or fire may result.

- Newly installing or moving equipment
- Removing the front, rear, and side covers
- Installing and removing built-in options
- Connecting and disconnecting external interface cables
- Maintenance (repair and periodic diagnosis and maintenance)

1.1   Preparing to Configure the SAN Boot Environment

The following hardware and software are required to configure the SAN boot environment.

Required hardware

- PRIMEQUEST 2000 series main unit
- Fibre Channel card (8Gbps/16Gbps FC card).
  The main unit for performing a SAN boot must have a mounted FC card (8Gbps/16Gbps).
- PC for the setup of the SAN storage unit (ETERNUS) and FC switch (If the PC requirements are satisfied, it can also be used as another console such as the MMB console. For details, see the manual for each device.)

Remark

For information on the FC card, contact the distributor where you purchased your product, or your sales representative.

Required software

For details on the operating systems that support the SAN boot, the FC card/driver/firmware, and the FC card/firmware version, visit the following website. Also, the latest driver and firmware can be obtained from the following website. For a multipath configuration, the ETERNUS multipath driver is required.

- Driver/firmware website

http://support.ts.fujitsu.com/Download/

**Acquire the drivers and utilities for the FC card from the above website. For a multipath configuration, the ETERNUS multipath driver is required.

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1.2 SAN Boot Environment Configuration Flow

This section describes the configuration flow for SAN boot environment. Follow steps 1 to 4 below to configure the SAN boot environment.

Notes
- Use a single path configuration (connection with only one FC cable) until the installation of the operating system and multipath driver is completed.
- After installing the operating system and multipath driver, connect the FC cable to restore the original state. Then, power on the partition of the PRIMEQUEST 2000 series server again.
- Register the LUN that is the destination of operating system installation in all of the HBAs to be used for starting the system.
- Before turning on the power to the partition of the PRIMEQUEST 2000 series server, confirm that the SAN storage where the operating system is to be stored and the FC switch are completely ready.

1. Designing the SAN boot environment
   - Create a drawing for FC cabling between the SAN storage unit and the PRIMEQUEST 2000 series server in which the SAN boot environment is to be configured. Also create a zone design drawing.
   - Design the RAID (LUN_R) settings and partition (LUN) for the SAN storage that stores the target operating system of SAN boot.
   - Check 1.3 Notes on SAN Boot Environment Design.

2. Making the settings for the PRIMEQUEST 2000 series server
   - Change the UEFI setting of the PRIMEQUEST 2000 series server and the HBA UEFI/extended BIOS setting of the FC card.
   - Record the WWN for each FC port. Also record the WWNN as required.

3. Making the settings for the SAN environment
   - According to the drawing for FC cabling designed in step 1, install the SAN storage and FC switch and connect them with cables.
   - Based on the RAID setting, partition design, and zone information designed in step 1 and on the WWN information written down in step 2, make the settings for the SAN storage and FC switches.
   - In the setting of the HBA UEFI/extended BIOS of the FC card included in the PRIMEQUEST 2000 series server, search for the WWN of the connection destination SAN storage and set it.

4. Installing the OS and bundled software
   - Use SVIM to install the OS and bundled software.
   - Install the multipath driver as required.
   - According to the drawing for FC cabling designed in step 1, connect the PRIMEQUEST 2000 series server with the SAN storage/FC switch.
   - Register the boot disk (LUN that is the destination of operating system installation) in all of the HBAs to be used for starting the system.
   - LUN at the dump output destination is registered on the FC card when setting it to dump device SAN storage of sadump.

· Specify the priority of the boot devices with the UEFI or Legacy BIOS of the PRIMEQUEST 2000 series server.

1.3   Notes on SAN Boot Environment Design

This section provides notes on designing the SAN boot environment.
· 1.3.1 Notes on system design
· 1.3.2 Notes on system installation
· 1.3.3 Notes on system after installation
· 1.3.4 Notes on system operation

1.3.1   Notes on system design

Note the following points when designing the system.
· Traffic on the FC may be maximized for some software used. Be sure to measure its performance on a system such as a pseudo system before installing it.
· For SAN storage, the boot disk to be assigned for each server must be configured so that it is exclusively accessed from other servers. This is done by zoning or masking LUNs (LUN) or combining them. (In a SAN boot environment, boot disk LUNs (LUN) must be such that servers and storage have a one-to-one correspondence.)
· Only a single pass is effective for dump truck output of sadump. Therefore, Even if a pass is cut during dump truck output, other passes don't become effective. Without continuing, the dump truck output is failed.
· Only a port on the FC card used for an OS start makes the boot setting effective. When boot setting in a port on the FC card which isn't used for an OS start (data pass) becomes effective, OS doesn't sometimes start.
· Restriction: The following Windows operating systems can be installed in the SAN boot environment.
    - Windows Server 2012 R2
    - Windows Server 2012
    - Windows Server 2008 R2 SP1
    - Windows Server 2008 R2

1.3.2   Notes on system installation

Keep the following points in mind when installing the system.
· For Notes on ServerView Suite, contact the distributor where you purchased your product, or your sales representative.
· Every disk except the boot disk must not be visible during installation of the operating system. Disconnect all disks other than the installation destination disk. For a multipath configuration, change it to a single-path configuration (only one FC cable connected). Also, the settings on the ETERNUS side must be such that only the boot disk is visible. For details on settings on the ETERNUS side, see 1.4 ETERNUS Connection Settings.

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1.3.3 Notes on system after installation

When the system is installed on UEFI BIOS, to set the by-path boot in the boot option is recommended after the OS installation.

- Procedure for the boot option setting by using SAN boot by-path.
  1. Start the Partition.

     During FUJITSU logo appears, press any key (except the [Enter] key) to display the Boot Manager front page.

  2. Select [Boot Maintenance Manager].

  3. Select [Boot Option] in the [Boot Maintenance Manager] screen.

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4. Select [Add Boot Option] in the [Boot Option] screen.

5. Select Fibre Disl Volume (Main) in the [File Explorer] screen.

   Select Volume(Main) for …/Fibre (connected to WWN, connected to LUN).

Select boot file, and the [ESC] several times.

The hierarchy of the selection and the chosen file are different, according to the kind of OS.

[exp.] Windows server,

   Select [<EFI>] -> [<Microsoft>] -> [<Boot>] -> [bootmgfw.efi].

[exp.] RHEL server,

   Select [<EFI>] -> [<redhat>] -> [grub.efi].

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6. Move the cursor on [Input the description] in the Modify Boot Option Description screen, and then press the [Enter] key.
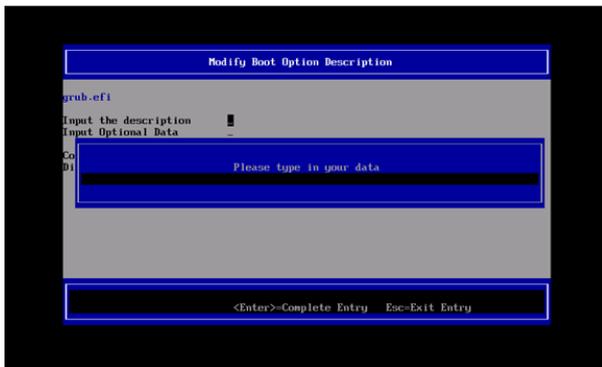
7. Enter the <<Boot Option Name (Main)>> in the [Please type in your data] screen.

(Create the Boot Option Name with five and more characters.)

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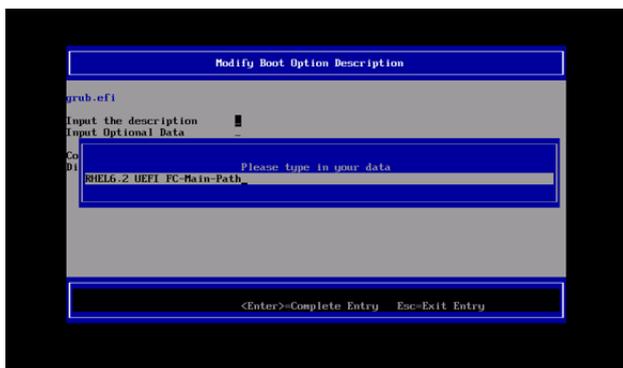
8. Select [Commit Changes and Exit] in the [Modify Boot Option Description] screen, and then press the [Enter] key.
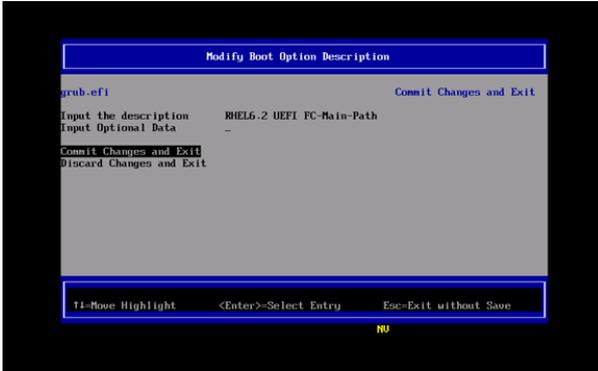
9. Follow the procedures 5 to 8 to setup the Boot Option (Sub).

10. Select [Boot Options] in the [Boot Maintenance Manager] screen.
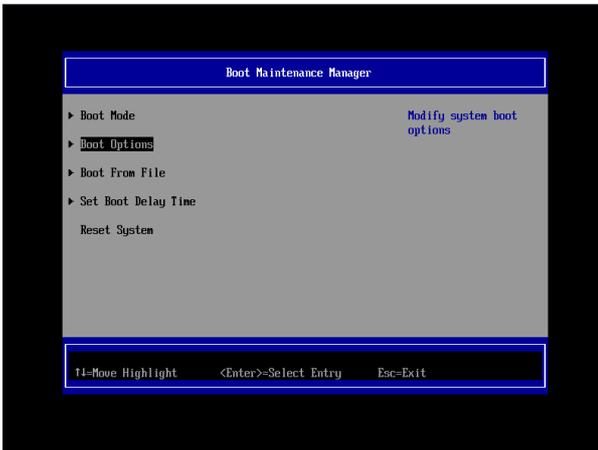
11. Select [Change Boot Order] in the [Boot Option] Screen.

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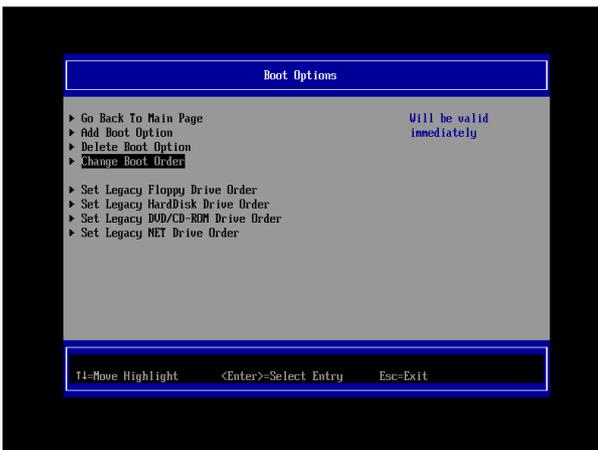
12. Select [Change the order] in the [Change Boot Order] screen.

13. Press the [+] key or the [-] key in the [Change Boot Order] screen and set the Boot priority as below.

   Move the <<Boot Option Name (Main)>> to the top.

   Move the <<Boot Option Name (Main)>> to the second top.
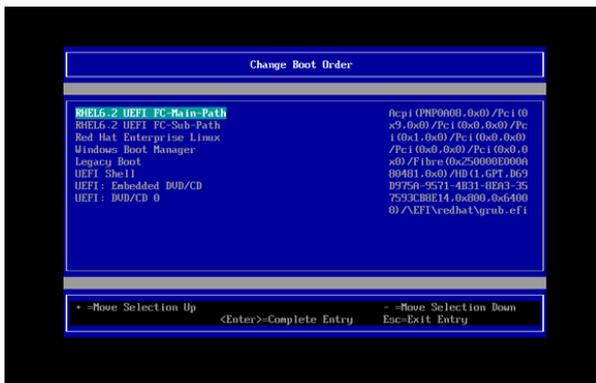
14. After modifying the Boot priority, press the [Enter] key.

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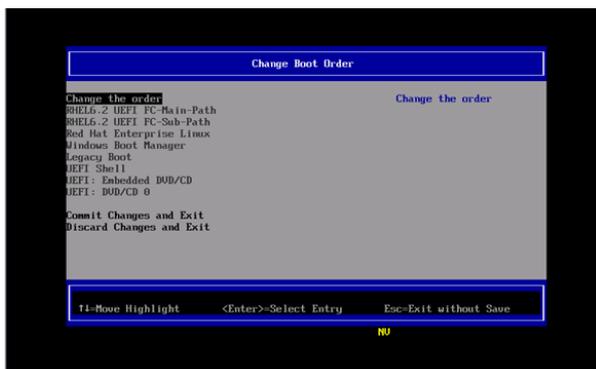
15. Select [Commit Changes and Exit] in the [Change Boot Order] screen, and then press the [Enter] key.
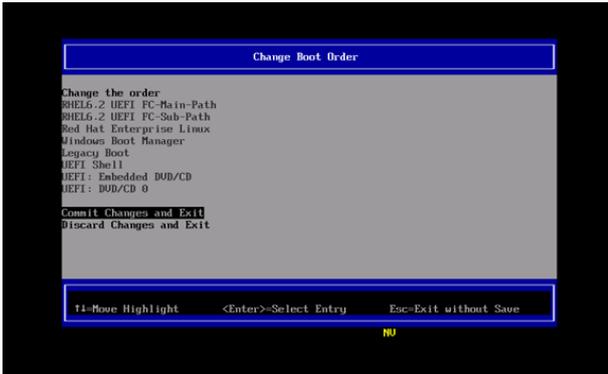
16. Select [Boot Options] in the [Boot Maintenance Manager] screen.

17. Select [Delete Boot Option] in the [Boot Options] screen.
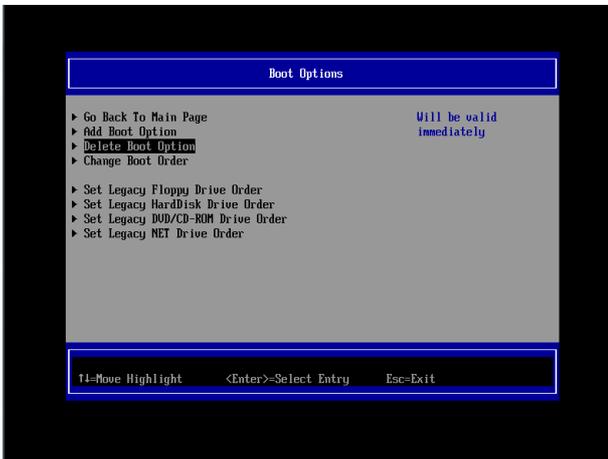
18. In the [Delete Boot Options] screen, select the by-id boot option which is set when installing the OS to delete it and press the [Enter] key. (If the by-id Boot Option is shown as entry named HD(….)/…)

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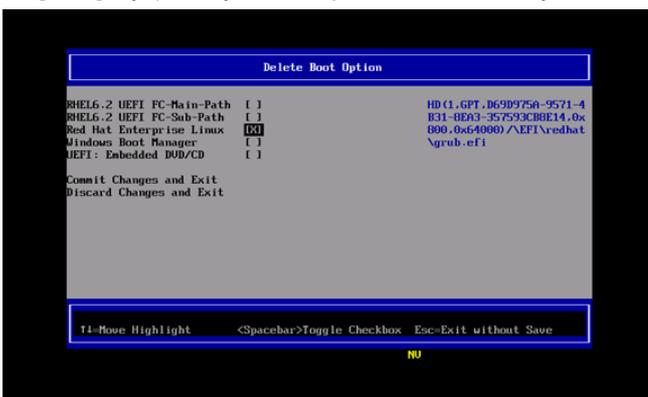
19. Select [Commit Changes and Exit] in the [Delete Boot Option] screen.


```
                        Delete Boot Option

RHEL6.2 UEFI FC-Main-Path   [ ]
RHEL6.2 UEFI FC-Sub-Path    [ ]
Red Hat Enterprise Linux    [X]
Windows Boot Manager        [ ]
UEFI: Embedded DVD/CD        [ ]

Commit Changes and Exit
Discard Changes and Exit




↑↓=Move Highlight      <Enter>=Select Entry      Esc=Exit without Save
                              NU
```
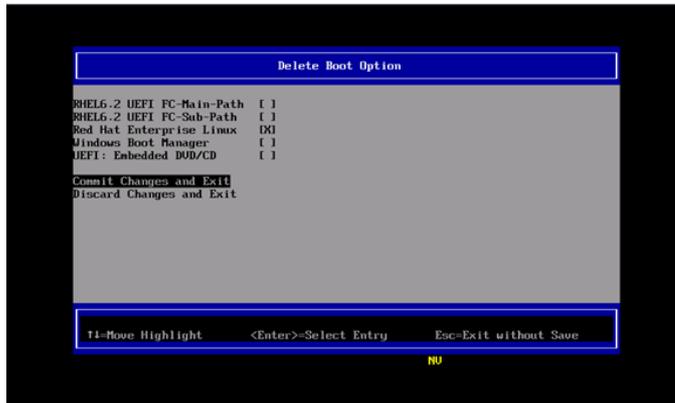
20. Select [Reset System] in the [Boot Maintenance Manager] screen, and then reboot the Partition.


```
                    Boot Maintenance Manager

▶ Boot Mode                          Reset System

▶ Boot Options

▶ Boot From File

▶ Set Boot Delay Time

  Reset System




↑↓=Move Highlight      <Enter>=Select Entry      Esc=Exit
```
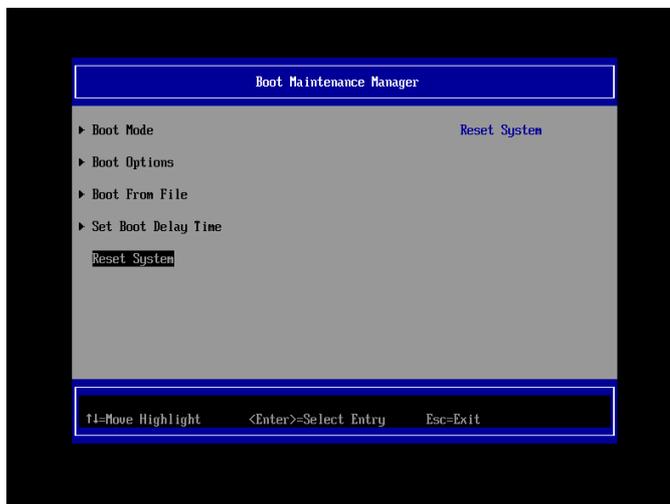
Please initialize the setting of the FC card side when there is the following configuration changes after introducing the system.
Setting on an FC card is redone. If resetting is completed, please reboot system.

- When a dump device of sadump is registered with an FC card..
- When SAN storage and setting change in the FC switch were performed. (Change in the LUN mapping. Host affinity and each port zoning change etc)
- When the OS which starts by configuration change is changed.
- When you register the device to the FC card to add the LUN device
  Please refer to "2.1.5/3.1.5 the initialization of the FC card setting" for the initialization of the FC card.
  Please refer to the following for the FC card resetting.
   CHAPTER 2 Settings on the Fibre Channel Card (8Gbps FC Card)
   CHAPTER 3 Settings on the Fibre Channel Card (16Gbps FC Card)

1.3.4　Notes on system operation

Keep the following points in mind when operating the system.

- Be sure to confirm that the SAN storage and FC switch are completely in the Ready state.
- Use the MMB Web-UI to set the time period until the power-on of the partition.
- When the partition is started, the boot disk may not be found. In this case, try partition reset from the UEFI.
- Record the dates and times of server switching (FC card replacement. Including move.) on separate media. Prepare this media in case the possibly faulty part of the hardware can no longer be located in an event log primary analysis, at a hardware failure, or at the occurrence of another problem.
- When the FC card has been replaced with a maintenance part, the HBA UEFI/Legacy BIOS must be reset. Also, the SAN storage unit must be reset.
- In the SAN boot environment, OS boot may fail depending on the quality of the FC transmission path. In such a case, use the FC switch and SAN storage unit to check the alarm or system status and identify the faulty part. Then, select [Reset] from the [Power Control] window of the MMB Web-UI to restart the system.
- In a Linux environment, a SAN boot in a multipath configuration may be performed. To start up in Rescue mode and automatically mount the ETERNUS disk in such cases, enable only one FC port in advance of startup.
  If the multipath configuration is left as is, the system may fail to start up normally. Even if you do not use automatic mounting, we recommend enabling only one FC port in advance of startup in Rescue mode in order to prevent operational errors.
  For details, see the notes on operating system installation in 1.3.2 Notes on system installation.

1.4　ETERNUS Connection Settings

For details on the settings required on the ETERNUS when connecting to it, see the ETERNUS manuals at the following website:

http://www.fujitsu.com/global/support/products/computing/storage/disk/manuals/

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CHAPTER 2 Settings on the Fibre Channel Card (8Gbps FC Card)

This chapter describes the settings to be made on the 8Gbps FC Card in the PRIMEQUEST 2000 series server. With the resultant settings, the system starts from an LUN of the SAN storage unit in the FC SAN boot environment.

2.1 Procedure for Setting UEFI Driver Version 4.13a6 or Later on the 8Gbps FC Card

This section describes the procedure for setting UEFI driver version 4.13a6 or later.

To have the system start from a LUN of the SAN storage unit in the SAN boot environment, the operation described below is required for all of the HBAs to be used for starting the system.
Executing this operation registers in the HBA the SAN storage unit LUN from which the system is to be started. This section uses examples of screen displays resulting from the use of UEFI driver versions 4.13a6. All screenshots appearing below are display examples whose contents vary depending on the system configuration, etc.

Notes
- To add sadump as dump device of SAN, setting LUN by selecting [Add Boot Device] on the UEFI driver utility is required.
- If the UEFI boot menu has the setup menu, select the setup menu and proceed to the work described in 2.1.3 Starting the HBA setup utility.
  When the setting is adding changed by the above-mentioned, the partition rebooting is necessary.
  please execute the action after rebooting a pertinent partition.
  Please push either of key (space key) while the FUJITSU logo is displayed. 'Enter' is excluded.

When the above-mentioned is not done, the dump device is not added.

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·　Different 8Gbps FC Card firmware versions cannot be mixed in a single partition. Moreover, different Boot BIOS driver versions cannot be mixed in a single partition. If you have different versions of the 8Gbps FC Card firmware or UEFI driver, install the same version of the firmware driver, respectively.

2.1.1　Selecting the method of making settings for the 8Gbps FC Card

Check the UEFI driver version from the [Device Manager] screen of the Boot Manager Front Page.

1.　Select [Force boot into EFI Boot Manager] from [Boot Selector] in the [Power Control] window of the MMB. Then, turn on the power. Start the UEFI Shell.
2.　The Boot Manager Front Page appears. Select [Device Manager], and then press the [Enter] key.
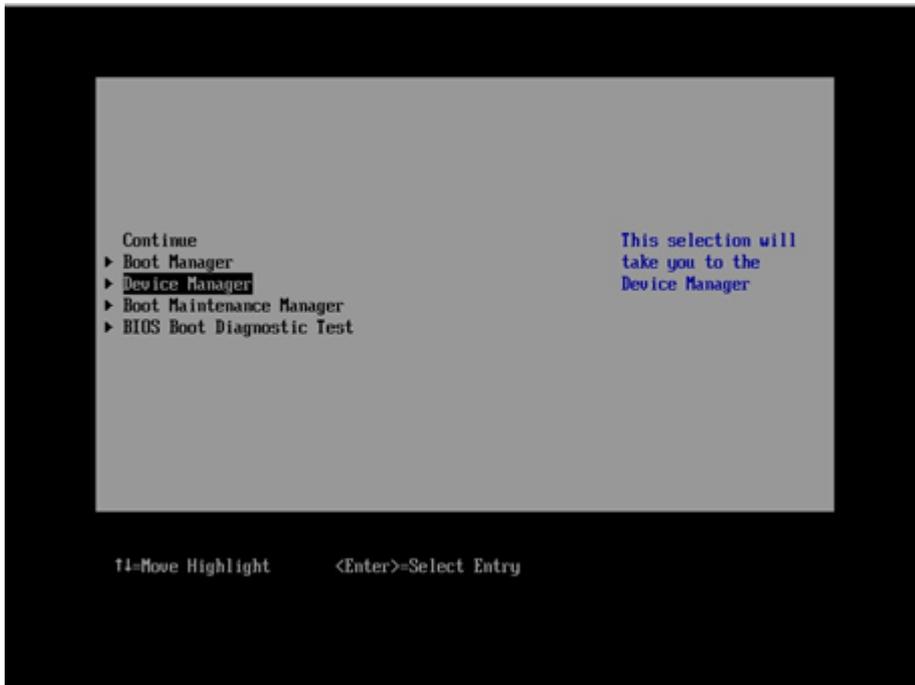
FIGURE 2.1 Boot Manager front page (screen display example)

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3. The [Device Manager] screen appears.

    Select [Emulex 001:LPe12xxxxxx PCIe2.5Gb/s, x8 WWN:xxxxxxxxxxxxxxxx], and then press the [Enter] key.

```
┌─────────────────────────────────────────────────────────────────────┐
│                          Device Manager                               │
├─────────────────────────────────────────────────────────────────────┤
│                                                                       │
│    Devices List                               Emulex HBA              │
│  ▶ System Information                         Configuration Utility    │
│  ▶ iSCSI Configuration                        HELP                    │
│  ▶ CPU Configuration                                                  │
│  ▶ Memory Configuration                                               │
│  ▶ USB Configuration                                                  │
│  ▶ Security Configuration                                             │
│  ▶ sadump Configuration                                               │
│  ▶ Network Device List                                                │
│  ▶ Emulex  001: LPe12002-M8    PCIe2.5Gb/s , x8                        │
│    WWN:10000000C9881A6E                                                │
│  ▶ Emulex  002: LPe12002-M8    PCIe2.5Gb/s , x8                        │
│    WWN:10000000C9881A6F                                                │
│  ▶ Port 001:Emulex LPe16002-M6 PCIe 2-port 16Gb Fibre                 │
│    Channel                                                            │
│                                                      ↓                 │
│                                                                       │
├─────────────────────────────────────────────────────────────────────┤
│  ↑↓=Move Highlight        <Enter>=Select Entry      Esc=Exit          │
└─────────────────────────────────────────────────────────────────────┘
```

FIGURE 2.2 Device List

4. The Emulex Adapter Configuration Main Menu screen is displayed.

    Select [Display Adapter Info], and then press the [Enter] key.

```
┌─────────────────────────────────────────────────────────────────────┐
│              Emulex Adapter Configuration Main Menu                    │
├─────────────────────────────────────────────────────────────────────┤
│                                                                       │
│    001: LPe12002-M8    PCIe2.5Gb/s , x8          Display Adapter Info  │
│    LPe12002-M8 Node Name : 20000000C9881A6E                           │
│    Seg#: 000 Bus#: 0C Dev#: 00 Func#: 00                              │
│                                                                       │
│    Back to Display Adapters and RECONNECT DEVICES                     │
│    Set Boot from SAN           <Disable>                              │
│  ▶ Scan for Fibre Devices                                             │
│  ▶ Add Boot Device                                                    │
│  ▶ Delete Boot Device                                                 │
│  ▶ Change Boot Device Order                                           │
│  ▶ Configure HBA and Boot Parameters                                  │
│  ▶ Set Emulex Adapter to Default Settings                             │
│  ▶ Display Adapter Info                                               │
│                                                                       │
│                                                                       │
├─────────────────────────────────────────────────────────────────────┤
│  ↑↓=Move Highlight        <Enter>=Select Entry      Esc=Exit          │
└─────────────────────────────────────────────────────────────────────┘
```

FIGURE 2.3 Emulex Adapter Configuration Main Menu

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5. The controller Information is displayed.

    Select [Display Adapter Info], and then press the [Enter] key. Check the Firmware and EFI BIOS.

```
┌─────────────────────────────────────────────────────────────────┐
│                    Controller Information                       │
├─────────────────────────────────────────────────────────────────┤
│                                                                 │
│   001: LPe12002-M8    PCIe2.5Gb/s , x8        Go to Configuration│
│   Seg#: 000 Bus#: 0C Dev#: 00 Func#: 00       Main Menu         │
│                                                                 │
│ ▶ Go to Configuration Main Menu                                 │
│   Segment # :              00                                   │
│   Bus # :                  0C                                   │
│   Device # :               00                                   │
│   Function # :             00                                   │
│                                                                 │
│   HBA Status :             Ready                                │
│   Boot from SAN :          Disabled                             │
│   Link Speed :             NA                                   │
│   Topology :               Auto Loop First                     │
│   Firmware :               US2.01A12                            │
│   EFI Boot :               4.13a6                               │
│                                                                 │
├─────────────────────────────────────────────────────────────────┤
│  ↑↓=Move Highlight      <Enter>=Select Entry      Esc=Exit     │
└─────────────────────────────────────────────────────────────────┘
```
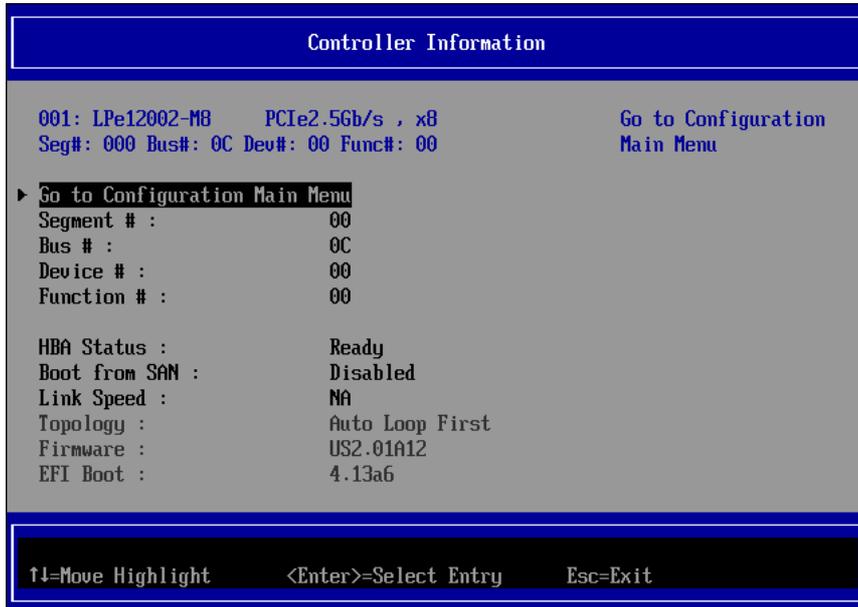
FIGURE 2.4 Controller Information

Note

the following points when using UEFI driver version 4.13a6 or later to set a SAN boot configuration on
the 8Gbps FC Card. (In the above example, Emulex Configuration Utility Ver. is 4.13a6.)

·   Before deleting a registered boot entry with the Delete Boot Device process, be sure to change the BIOS enable
    setting (Set Boot from SAN) to Disable.

·   Executing the Delete Boot Device process with Enable as the BIOS enable setting (Set Boot from SAN) may render
    Emulex Configuration Utility inoperable on rare occasions. In such cases, select [Reset] from the [Power Control]
    window of the MMB Web-UI to restart the system. Then, make the settings on the 8Gbps FC Card again.

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2.1.2 Displaying the Device Manager

1. Select [Device Manager], and then press the [Enter] key.

FIGURE 2.5 Boot Manager front page (screen display example)

2. The [Device Manager] screen appears.

2.1.3 Starting the HBA setup utility and Selecting and HBA

1. HBA list to be set is displayed on [Device Manager] screen.
2. Select [Emulex 001:LPe12xxxxxx PCIe2.5Gb/s, x8 WWN:xxxxxxxxxxxxxxxx] screen, and then press the [Enter] Key.

   (Above is the example where port 0 of LPe12002-M8 Dual port FC card) is selected.)
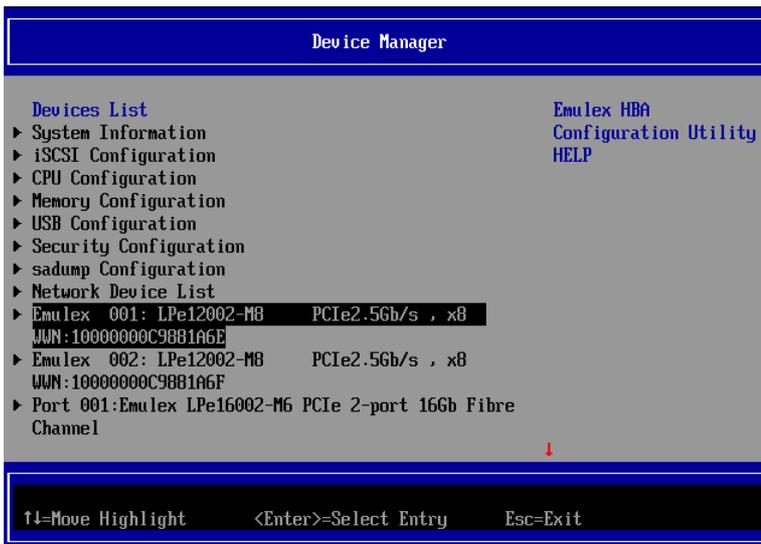
FIGURE 2.6 Device Manager screen (Device List)

3. The Emulex Adapter Configuration Main Menu is displayed.

```
Emulex Adapter Configuration Main Menu

001: LPe12002-M8    PCIe2.5Gb/s , x8             Display Adapter Info
LPe12002-M8 Node Name : 20000000C9881A6E
Seg#: 000 Bus#: 0C Dev#: 00 Func#: 00

Back to Display Adapters and RECONNECT DEVICES
Set Boot from SAN          <Disable>
▶ Scan for Fibre Devices
▶ Add Boot Device
▶ Delete Boot Device
▶ Change Boot Device Order
▶ Configure HBA and Boot Parameters
▶ Set Emulex Adapter to Default Settings
▶ Display Adapter Info

↑↓=Move Highlight       <Enter>=Select Entry      Esc=Exit
```

FIGURE 2.7 Emulex Adapter Configuration Main Menu

2.1.4   Acquiring an HBA WWN

1. Confirm the WWN of the HBA for witch setup is currently being performed.

   The WWN of the HBA is displayed as [Node name].

```
Emulex Adapter Configuration Main Menu

001: LPe12002-M8    PCIe2.5Gb/s , x8             Display Adapter Info
LPe12002-M8 Node Name : 20000000C9881A6E
Seg#: 000 Bus#: 0C Dev#: 00 Func#: 00

Back to Display Adapters and RECONNECT DEVICES
Set Boot from SAN          <Disable>
▶ Scan for Fibre Devices
▶ Add Boot Device
▶ Delete Boot Device
▶ Change Boot Device Order
▶ Configure HBA and Boot Parameters
▶ Set Emulex Adapter to Default Settings
▶ Display Adapter Info

↑↓=Move Highlight       <Enter>=Select Entry      Esc=Exit
```

FIGURE 2.8 Emulex Adapter Configuration Main Menu

The MMB Web-UI displays the slot containing the mounted HBA as the [PCI-Express Slots] item whose [Seg/Bus/Dev] values match the Seg#, Bus#, and Dev# values on the screen shown in FIGURE 3.8 [Emulex Adapter Configuration Main Menu] screen.

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Remarks

The [IOU] and [PCI_Box] screens of the System menu display the [PCI-Express Slots] items.

The [Emulex FC EFI-Bios Utility] screen uses hexadecimal notation for the displayed values, and the MMB Web-UI uses decimal notation.

For details on mounting locations, see APPENDIX B Physical Mounting Locations and Port Numbers in the *PRIMEQUEST 2000 Series Administration Manual* (C92344-0537).

PCI-Express Slots

PCI Slot#	Power Status	Slot Status	Link Width	Seg/Bus/Dev	PCI-Express Card Information
					Firmware Version
0	Standby	Not-present			
1	On	OK	x8	0/13/0	-
					-
2	On	OK	x8	0/14/0	-
					-
3	Standby	Not-present			

FIGURE 2.9 MMB Web-UI display

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2.1.5 Initializing the HBA setting

Restore the HBA setting to the default state.

Remarks

An HBA that has just been shipped from the factory has initialized settings and does not require the work below.

Perform this work to initialize them again.

1. Select [Set Emulex Adapter to Default Settings], and then press the [Enter] key.

```
┌──────────────────────────────────────────────────────────────────┐
│            Emulex Adapter Configuration Main Menu                  │
├──────────────────────────────────────────────────────────────────┤
│                                                                    │
│   001: LPe12002-M8     PCIe2.5Gb/s , x8          Set Emulex Adapter to │
│   LPe12002-M8 Node Name : 20000000C9881A6E       Default Settings  │
│   Seg#: 000 Bus#: 0C Dev#: 00 Func#: 00                            │
│                                                                    │
│   Back to Display Adapters and RECONNECT DEVICES                   │
│   Set Boot from SAN          <Disable>                             │
│ ▶ Scan for Fibre Devices                                           │
│ ▶ Add Boot Device                                                  │
│ ▶ Delete Boot Device                                               │
│ ▶ Change Boot Device Order                                         │
│ ▶ Configure HBA and Boot Parameters                                │
│ ▶ Set Emulex Adapter to Default Settings                           │
│ ▶ Display Adapter Info                                             │
│                                                                    │
│                                                                    │
├──────────────────────────────────────────────────────────────────┤
│  ↑↓=Move Highlight      <Enter>=Select Entry      Esc=Exit         │
└──────────────────────────────────────────────────────────────────┘
```

FIGURE 2.10 Emulex Adapter Configuration Main Menu

2. The [Set Emulex Adapter to Default Settings] screen appears. Select [Set Adapter Defaults], and then press the [Enter] key.

```
┌──────────────────────────────────────────────────────────────────┐
│            Set Emulex Adapter to Default Settings                  │
├──────────────────────────────────────────────────────────────────┤
│                                                                    │
│   LPe12002-M8 Node Name : 20000000C9881A6E       Set Adapter Defaults │
│   Seg#: 000 Bus#: 0C Dev#: 00 Func#: 00                            │
│                                                                    │
│ ▶ Set Adapter Defaults                                             │
│ ▶ Cancel Set Defaults                                              │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
│                                                                    │
├──────────────────────────────────────────────────────────────────┤
│  ↑↓=Move Highlight      <Enter>=Select Entry      Esc=Exit         │
└──────────────────────────────────────────────────────────────────┘
```
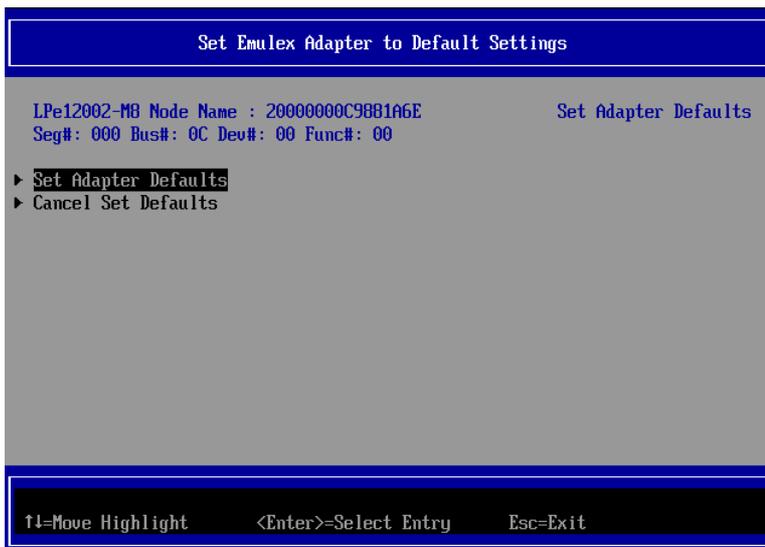
FIGURE 2.11 Set Emulex Adapter to Default Setting

20

3. After the completion of initialization, you are returned to the [Adapter Selection] screen.

2.1.6　Enabling BIOS

Enable the HBA BIOS so that the HBA can recognize the LUNs of the SAN storage unit and to enable the system to be started from one of them.

1. Select [Set Boot from SAN <Disable>] from the [Emulex Adapter Configuration Main Menu] screen.
    The screen for selecting <Disable> or <Enable> appears. Select <Enable>, and then press the [Enter] key.
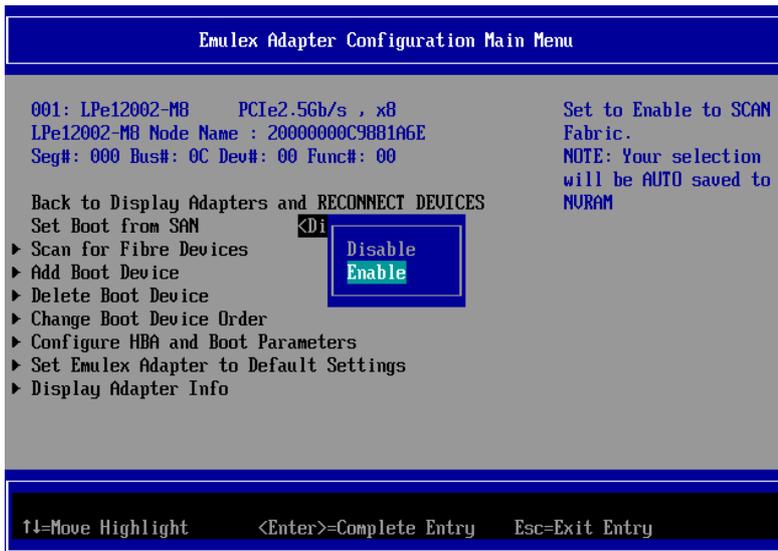
FIGURE 2.12 Set Boot from SAN Enabling boot (1)

2. Confirm that [Set Boot from SAN < Enable >] is displayed.

FIGURE 2.13 Set Boot from SAN Enabling boot (2)

21

2.1.7 Speed and Topology settings

The following describes how to make the Speed and Topology settings.

Note

Do not set [AUTO Loop First - default.] or [AUTO Point to Point first.]. First, make the fixed setting.

Otherwise, the connected device will not be normally recognized.

Static Topology setting

On the [Emulex Adapter Configuration Main Menu] screen, make the following setting that corresponds to the connection pattern (Fabric connection/FCAL connection).

1. Select [Configure HBA and Boot Parameters], and then press the [Enter] key.

```
┌──────────────────────────────────────────────────────────────┐
│              Emulex Adapter Configuration Main Menu            │
├──────────────────────────────────────────────────────────────┤
│                                                                │
│   001: LPe12002-M8     PCIe2.5Gb/s , x8         Configure HBA  │
│   LPe12002-M8 Node Name : 20000000C9881A6E      Parameters     │
│   Seg#: 000 Bus#: 0C Dev#: 00 Func#: 00                        │
│                                                                │
│   Back to Display Adapters and RECONNECT DEVICES               │
│   Set Boot from SAN          <Enable>                          │
│ ▶ Scan for Fibre Devices                                       │
│ ▶ Add Boot Device                                              │
│ ▶ Delete Boot Device                                           │
│ ▶ Change Boot Device Order                                     │
│ ▶ Configure HBA and Boot Parameters                            │
│ ▶ Set Emulex Adapter to Default Settings                       │
│ ▶ Display Adapter Info                                         │
│                                                                │
│                                                                │
├──────────────────────────────────────────────────────────────┤
│  ↑↓=Move Highlight      <Enter>=Select Entry      Esc=Exit     │
└──────────────────────────────────────────────────────────────┘
```

FIGURE 2.14 Static Topology setting (1)

2. Select [Topology Selection <AUTO Loop First –default>], and then press the [Enter] key.

```
┌──────────────────────────────────────────────────────────────┐
│                    Configure HBA Parameters                    │
├──────────────────────────────────────────────────────────────┤
│                                                                │
│   LPe12002-M8 Node Name : 20000000C9881A6E   Topology Selection│
│ ▶ Discard Changes                                              │
│ ▶ Commit  Changes                                              │
│   Topology Selection         <AUTO Loop First -                │
│                              default.>                         │
│   PLOGI Retry Timer          <Disable - Default>               │
│   Force Link Speed           <Auto negotiate - Default         │
│                              >                                 │
│   Configure Boot Parameters                                    │
│                                                                │
│   Maximum Luns/Target        [256]                             │
│   Boot Target Scan Method    <Boot Path From NVRAM             │
│                              Targets  >                         │
│   Delay Device Discovery     [0]                               │
│                                                                │
├──────────────────────────────────────────────────────────────┤
│  ↑↓=Move Highlight      <Enter>=Select Entry      Esc=Exit     │
└──────────────────────────────────────────────────────────────┘
```
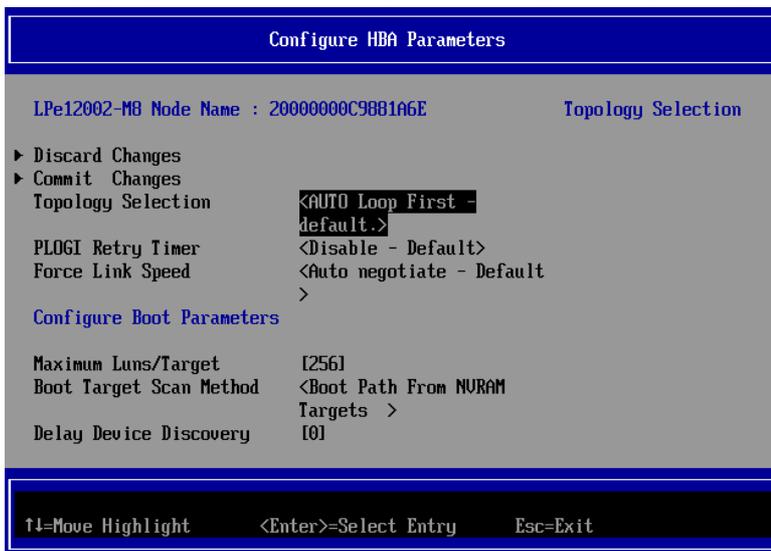
FIGURE 2.15 Static Topology setting (2)

22

3. Select the connection method, and then press the [Enter] key. Change the setting from the default setting of [AUTO Loop First -default] as follows.

Fabric connection: Point to Point.

FCAL connection: FCAL
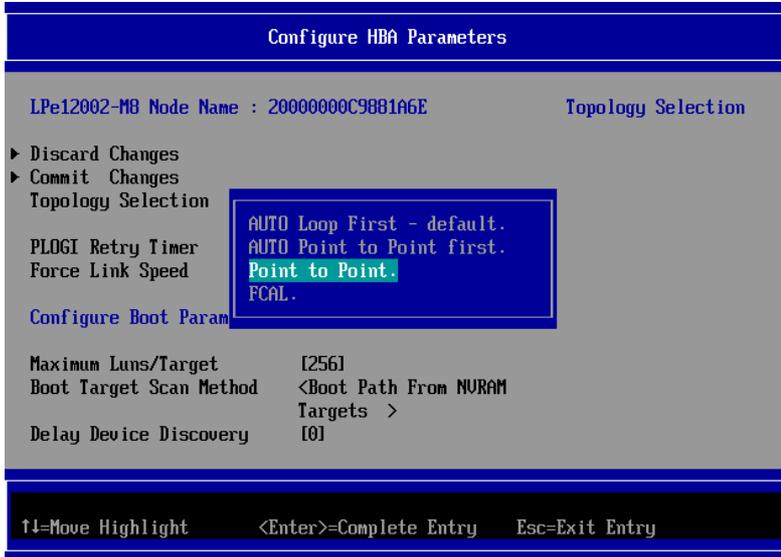
FIGURE 2.16 Selecting Point to Point.
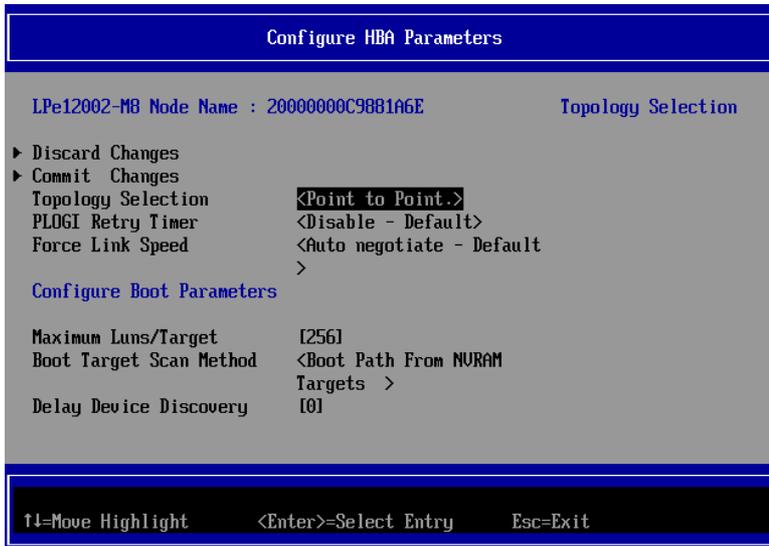
FIGURE 2.17 [Point to Point.] displayed

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FIGURE 2.18 Selecting FCAL
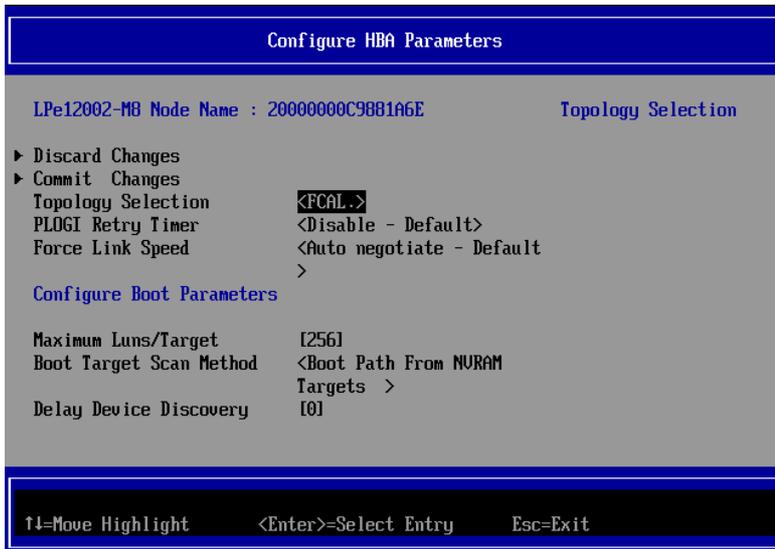
FIGURE 2.19 [FCAL.] displayed

Static Link Speed setting

With EFI-Bios, make the following setting that corresponds to the connection link speed (2 Gbps/4 Gbps/8 Gbps).

Note

Do not set [Auto negotiate - Default]. First, make the fixed setting for Link Speed. Otherwise, the connected device will not be normally recognized

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1. Select [Force Link Speed <Auto negotiate – Default>], and then press the [Enter] key.

```
                    Configure HBA Parameters

   LPe12002-M8 Node Name : 20000000C9881A6E        Force Link Speed

 ▶ Discard Changes
 ▶ Commit  Changes
   Topology Selection         <FCAL.>
   PLOGI Retry Timer          <Disable - Default>
   Force Link Speed           <Auto negotiate - Default
                              >
   Configure Boot Parameters

   Maximum Luns/Target        [256]
   Boot Target Scan Method    <Boot Path From NVRAM
                              Targets  >
   Delay Device Discovery     [0]



 ↑↓=Move Highlight       <Enter>=Select Entry     Esc=Exit
```
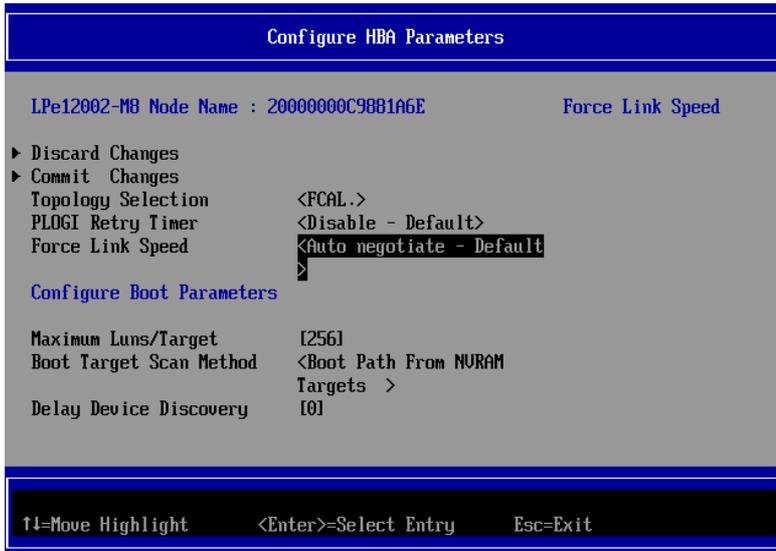
FIGURE 2.20 Static Link Speed setting (1)

2. Select the link speed corresponding to the connection environment (connected FC switch or SAN storage unit), and then press the [Enter] key.

```
                    Configure HBA Parameters

   LPe12002-M8 Node Name : 20000000C9881A6E        Force Link Speed

 ▶ Discard Changes
 ▶ Commit  Changes
   Topology Selection      ┌─────────────────────────┐
   PLOGI Retry Timer       │ Auto negotiate - Default │
   Force Link Speed        │ 1 Gb/s link speed        │
                           │ 2 Gb/s link speed        │
   Configure Boot Parame   │ 4 Gb/s link speed        │
                           │ 8 Gb/s link speed        │
   Maximum Luns/Target     └─────────────────────────┘
   Boot Target Scan Method    <Boot Path From NVRAM
                              Targets  >
   Delay Device Discovery     [0]



 ↑↓=Move Highlight       <Enter>=Complete Entry   Esc=Exit Entry
```
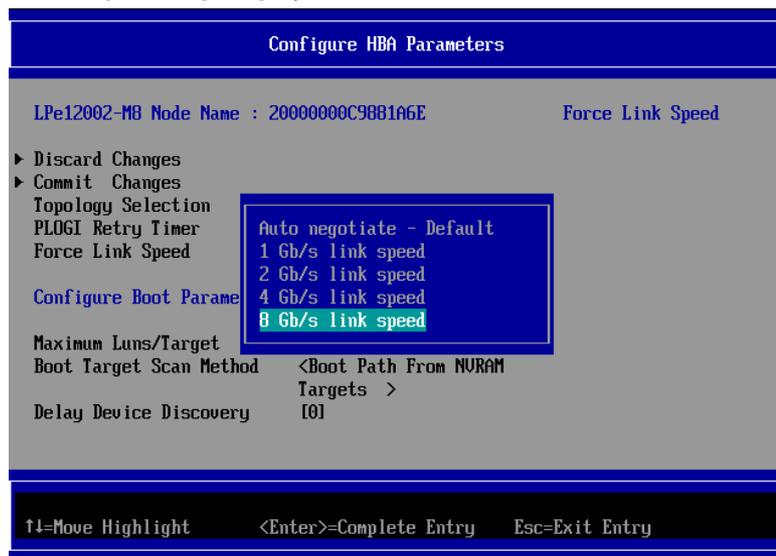
FIGURE 2.21 Static Link Speed setting (2)

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3.   Confirm that the specified link speed is displayed for [Force Link speed <xxxxxxx>]
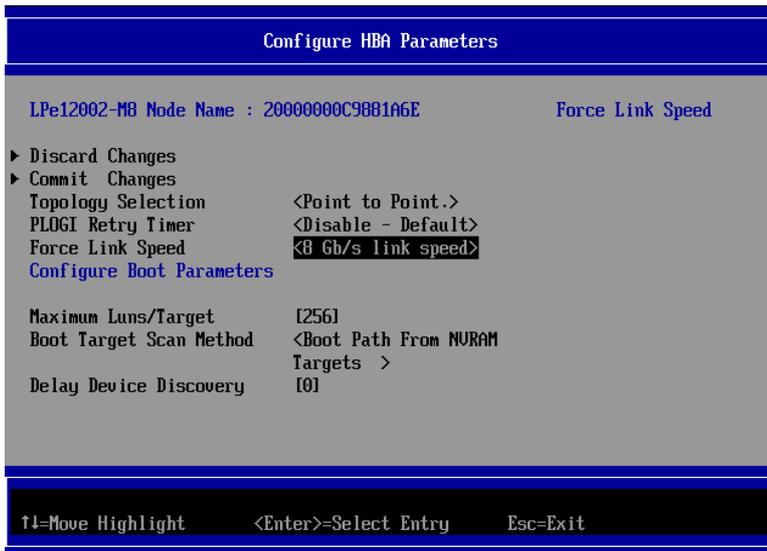
FIGURE 2.22 Static Link Speed setting (3)

4.   Select [Commit Changes], and then press the [Enter] key.
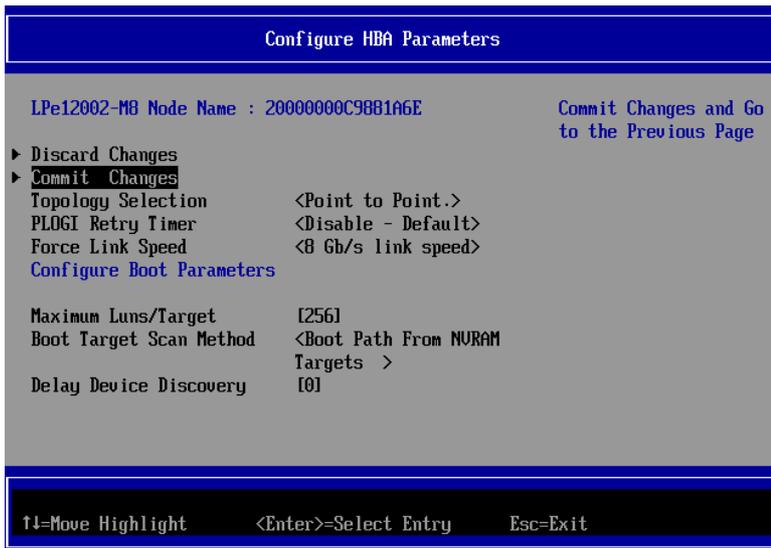
FIGURE 2.23 Topology / Link Speed change confirmation (1)

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5. After the completion of the Commit Changes process, you are returned to the [Emulex Adapter Configuration Main Menu] screen.
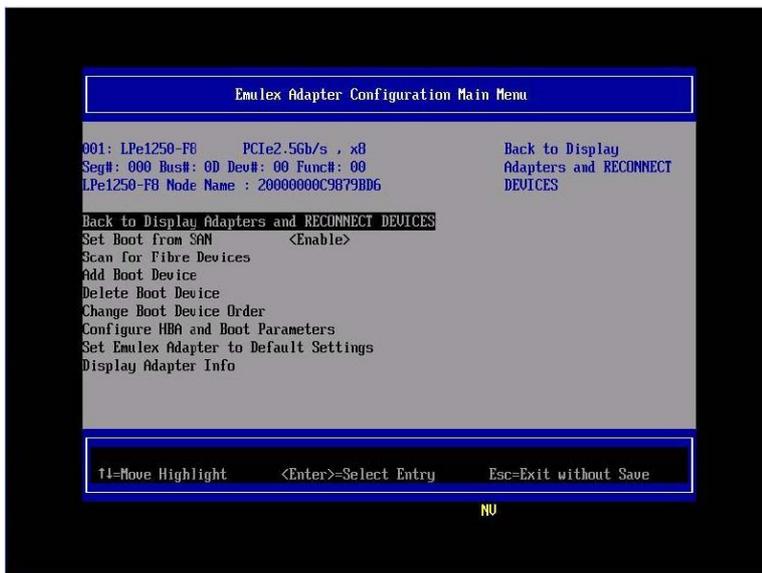
FIGURE 2.24 Topology / Link Speed change confirmation (2)

Remarks

After changing the [Topology Selection] or [Force Link Speed] settings and then selecting [Discard Changes], if you are returned to the screen for changing settings, the changes to the 8Gbps FC Card settings have been discarded. However, you may still see the changed settings displayed by the utility.

If so, select the 8Gbps FC Card again from the menu as described in 2.1.3 Starting the HBA setup utility and Selecting and HBA, before proceeding with the work.

Changing the setting of the opposing device

The setting of the opposing Fibre Channel switch and SAN storage unit disk array must also be made static so that it corresponds to the static setting of the 8Gbps FC Card.

For details on the settings required on the ETERNUS when connecting to it, see the ETERNUS manuals at the following website:

http://www.fujitsu.com/global/support/products/computing/storage/disk/manuals/

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2.1.8 Boot device setting

1. Select [Scan for Fibre Devices] from the [Emulex Adapter Configuration Main Menu] screen, and then press the [Enter] key.

FIGURE 2.25 Boot device setting (1)

2. [Please Wait] is displayed during the search process.
3. Press the [ESC] key or select [Go to Configuration Main Menu] to return the previous page, and then press the [Enter] key.

FIGURE 2.26 Boot device setting (2)

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4. Fibre Device information appears when the search process has been successful.

```
                    SAN Discovery Target List


LPe1250-F8 Node Name : 20000000C9879BD6          WWN: 2071000B 5D6A0510
Here are the discovered targets:                 Port ID: 0000EF

Go to Configuration Main Menu
0001: FUJITSU E8000            0000




        ↑↓=Move Highlight                       Esc=Exit without Save
```
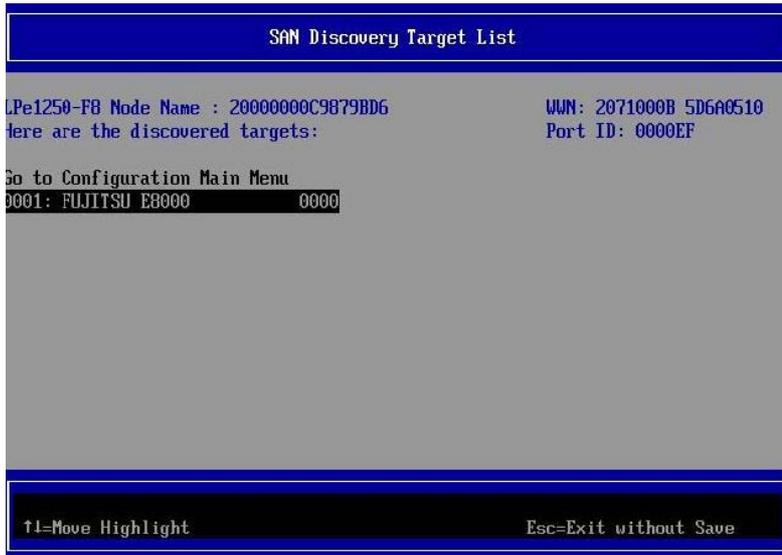
FIGURE 2.27 Boot device setting (3)

Remarks

If the expected Fibre Device is not displayed, there is a possibility that the setting of the SAN storage or the setting or physical connection of the FC switch is incorrect.

Confirm these settings once again.

5. Select [Go to Configuration Main Menu], and then press the [Enter] key.

```
                    SAN Discovery Target List


LPe1250-F8 Node Name : 20000000C9879BD6          Go to Configuration
Here are the discovered targets:                 Main Menu

Go to Configuration Main Menu
0001: FUJITSU E8000            0000




        ↑↓=Move Highlight      <Enter>=Select Entry    Esc=Exit without Save
```
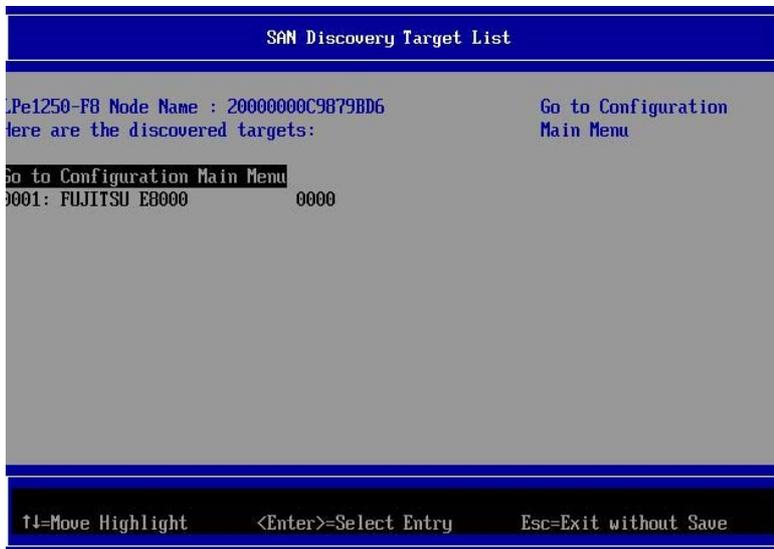
FIGURE 2.28 Boot device setting (4)

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6. The [Emulex Adapter Configuration Main Menu] screen appears. Select [Add Boot Device], and then press the [Enter] key.

```
          Emulex Adapter Configuration Main Menu

001: LPe1250-F8      PCIe2.5Gb/s , x8            Add Boot Device
Seg#: 000 Bus#: 0D Dev#: 00 Func#: 00
LPe1250-F8 Node Name : 20000000C9879BD6

Back to Display Adapters and RECONNECT DEVICES
Set Boot from SAN           <Enable>
Scan for Fibre Devices
Add Boot Device
Delete Boot Device
Change Boot Device Order
Configure HBA and Boot Parameters
Set Emulex Adapter to Default Settings
Display Adapter Info




  ↑↓=Move Highlight      <Enter>=Select Entry    Esc=Exit without Save
```

FIGURE 2.29 Boot device setting (5)

7. The [SAN Discovery Target List] screen displays the targets found in the search by [Scan for Fibre Devices]. Select the Fibre Device specifying the boot device, and then press the [Enter] key.

```
                 SAN Discovery Target List

LPe1250-F8 Node Name : 20000000C9879BD6        WWN: 2071000B 5D6A0510
Here are the discovered targets:              Port ID: 0000EF

Go to Configuration Main Menu
0001: FUJITSU E8000              0000








  ↑↓=Move Highlight      <Enter>=Select Entry    Esc=Exit without Save
```
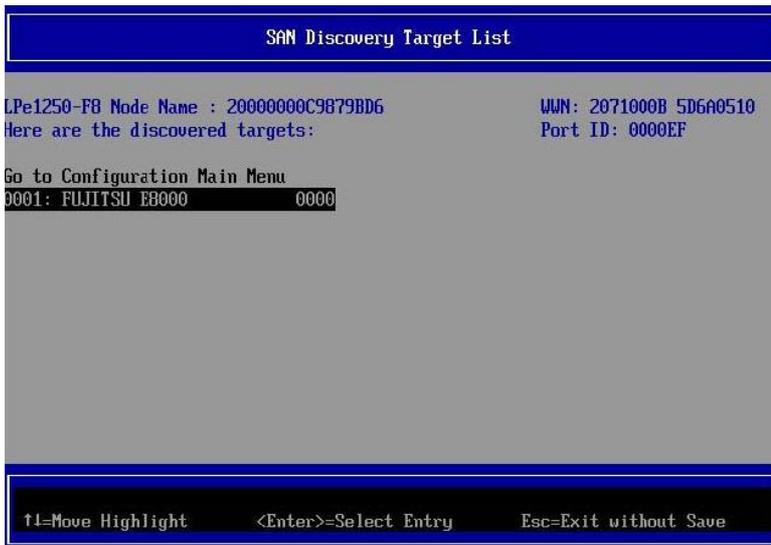
FIGURE 2.30 Boot device setting (6)

30

8. The LUN connected to the selected target is displayed. Select the LUN from which the system is to be started. Then, press the [Enter] key. A confirmation screen appears.

```
                LPe1250-F8 Node Name : 20000000C9879BD6


                                                 FUJITSU
WWN: 2071000B 5D6A0510                            E8000
                                                 0000
Return to Previous Page
LUN:0007 Mode: Peripheral dev




 ↑↓=Move Highlight        <Enter>=Select Entry      Esc=Exit without Save
```
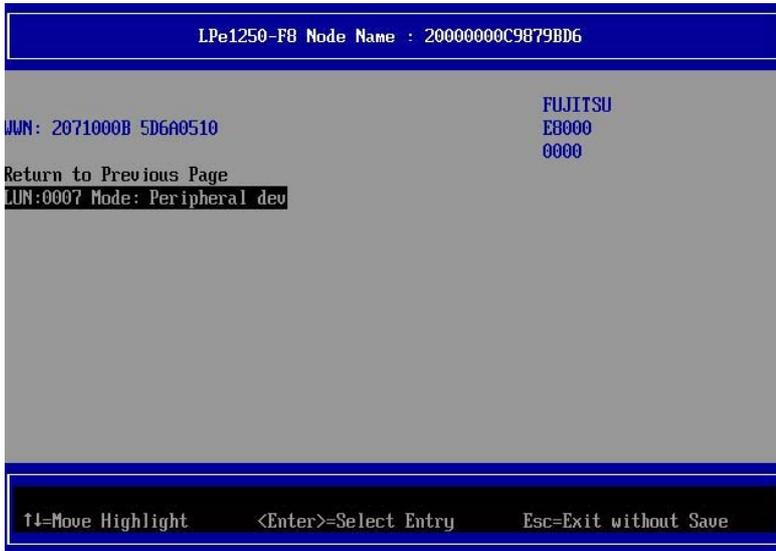
FIGURE 2.31 Boot device setting (7)

9. Select [Commit Changes], and then press the [Enter] key.

```
                    SAN Discovery Target List

LUN:0000 Mode: Peripheral dev                    Commit Changes and Go
LPe1250-F8 Node Name : 20000000C9879BD6          to the Previous Page

Commit Changes
Discard Changes




 ↑↓=Move Highlight        <Enter>=Select Entry      Esc=Exit without Save
```
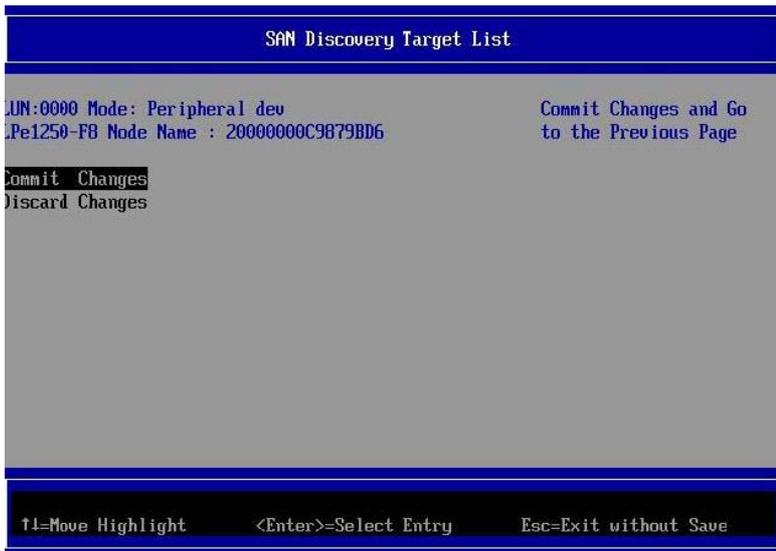
FIGURE 2.32 Boot device setting (8)

31

10. Select [Return to Previous Page], and then press the [Enter] key to return to the higher menu.

```
┌──────────────────────────────────────────────────────────────┐
│          LPe1250-F8 Node Name : 20000000C9879BD6               │
├──────────────────────────────────────────────────────────────┤
│                                                                │
│                                      Return to Previous Page   │
│ WN: 2071000B 5D6A0510                                          │
│                                                                │
│ Return to Previous Page                                        │
│ LUN:0007 Mode: Peripheral dev                                  │
│                                                                │
│                                                                │
│                                                                │
│                                                                │
│                                                                │
│                                                                │
│                                                                │
│ ↑↓=Move Highlight        <Enter>=Select Entry   Esc=Exit without Save │
└──────────────────────────────────────────────────────────────┘
```
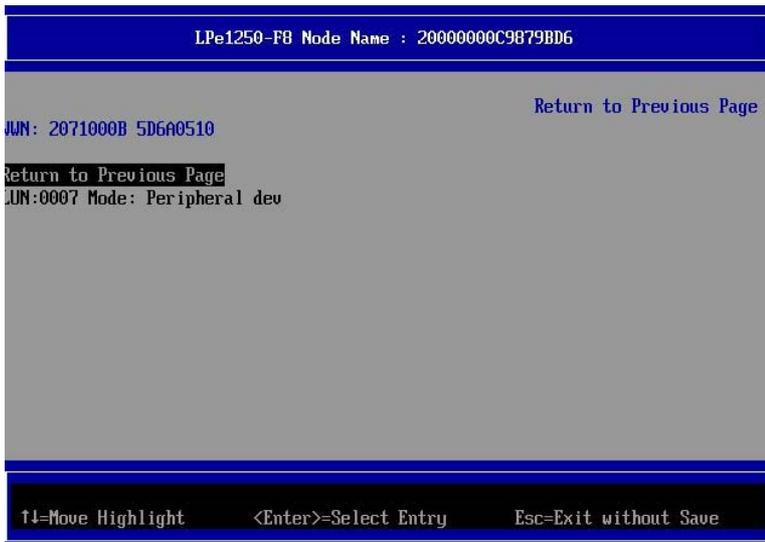
FIGURE 2.33 Boot device setting (9)

11. Select [Go to Configuration Main Menu], and then press the [Enter] key to return to the higher menu.

```
┌──────────────────────────────────────────────────────────────┐
│                   SAN Discovery Target List                    │
├──────────────────────────────────────────────────────────────┤
│                                                                │
│ LPe1250-F8 Node Name : 20000000C9879BD6     Go to Configuration│
│ Here are the discovered targets:            Main Menu          │
│                                                                │
│ Go to Configuration Main Menu                                  │
│ 0001: FUJITSU E8000            0000                            │
│                                                                │
│                                                                │
│                                                                │
│                                                                │
│                                                                │
│                                                                │
│ ↑↓=Move Highlight        <Enter>=Select Entry   Esc=Exit without Save │
└──────────────────────────────────────────────────────────────┘
```
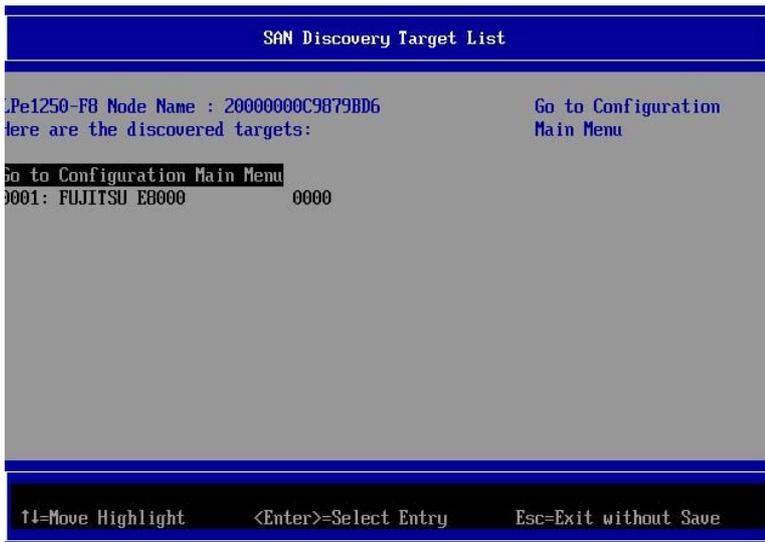
FIGURE 2.34 Boot device setting (10)

12. To register the dump device of sadump, procedure 5 is repeated. Please advance to step 13 when you do not register the dump device.

32

13. Select [Delete Boot Device] from the [Emulex Adapter Configuration Main Menu] screen, and then press the [Enter] key. (Here, confirm only the registration status of the boot device that was set with [Commit Changes].)

```
         Emulex Adapter Configuration Main Menu

002: LPe1250-F8      PCIe2.5Gb/s , x8          Delete Boot Device
Seg#: 000 Bus#: 0D Dev#: 00 Func#: 00
LPe1250-F8 Node Name : 20000000C9879BD6

Back to Display Adapters and RECONNECT DEVICES
Set Boot from SAN          <Enable>
Scan for Fibre Devices
Add Boot Device
Delete Boot Device
Change Boot Device Order
Configure HBA and Boot Parameters
Set Emulex Adapter to Default Settings
Display Adapter Info




  ↑↓=Move Highlight      <Enter>=Select Entry    Esc=Exit without Save
```

FIGURE 2.35 Boot device setting (11)

14. Confirm the registration of the boot device that was set with [Commit Changes].

In the following example, LUN 0007 is confirmed connected with the target WWN: 207100B 5D6A0510.

```
                      Delete Boot Device

LPe1250-F8 Node Name : 20000000C9879BD6          Mode: Per LUN: 0007

01: WWN:2071000B 5D6A0510  [ ]
02: WWN:00000000 00000000  [ ]
03: WWN:00000000 00000000  [ ]
04: WWN:00000000 00000000  [ ]
05: WWN:00000000 00000000  [ ]
06: WWN:00000000 00000000  [ ]
07: WWN:00000000 00000000  [ ]
08: WWN:00000000 00000000  [ ]
Discard Changes
Commit  Changes




  ↑↓=Move Highlight      <Spacebar>Toggle Checkbox  Esc=Exit without Save
```

FIGURE 2.36 Boot device setting (12)

33

15. Select [Discard Changes], and then press the [Enter] key to return to the higher menu.

```
                         Delete Boot Device


LPe1250-F8 Node Name : 20000000C9879BD6            Discard Changes and Go
                                                   to the Previous Page
01: WWN:2071000B 5D6A0510  [ ]
02: WWN:00000000 00000000  [ ]
03: WWN:00000000 00000000  [ ]
04: WWN:00000000 00000000  [ ]
05: WWN:00000000 00000000  [ ]
06: WWN:00000000 00000000  [ ]
07: WWN:00000000 00000000  [ ]
08: WWN:00000000 00000000  [ ]
Discard Changes
Commit  Changes




 ↑↓=Move Highlight      <Enter>=Select Entry      Esc=Exit without Save
```
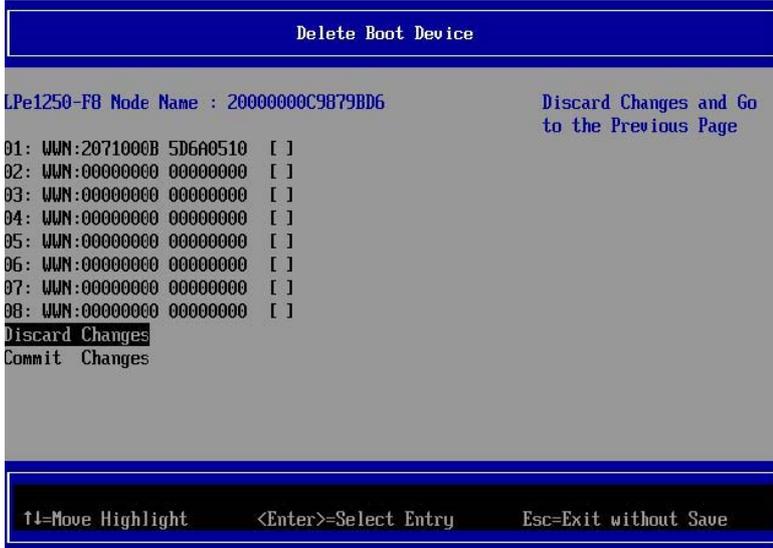
FIGURE 2.37 Boot device setting (13)

16. Press [ESC] key, and then press the [Y] key to return to the higher menu.

```
                  Emulex Adapter Configuration Main Menu


   001: LPe1250-F8      PCIe2.5Gb/s , x8            Set to Enable to SCAN
   LPe1250-F8 Node Name : 20000000C97BD19C         Fabric.
   Seg#: 000 Bus#: 0D Dev#: 00 Func#: 00           NOTE: Your selection
                                                   will be AUTO saved to
   Ba ┌──────────────────────────────────────────────────┐
   Se │                                                   │
 ► Sc │     Changes have not saved. Save Changes and exit?│
 ► Ad │ Press 'Y' to save and exit, 'N' to discard and exit, 'ESC' to cancel.
 ► De │                                                   │
 ► Ch └──────────────────────────────────────────────────┘
 ► Configure HBA and Boot Parameters
 ► Set Emulex Adapter to Default Settings
 ► Display Adapter Info




 ↑↓=Move Highlight      <Enter>=Select Entry      Esc=Exit
```

FIGURE 2.38 Boot device setting (14)

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Important) Do not select [Back to Display Adapters and RECONNECT DEVICES] to return to the higher menu,
If select, your system will hung up. If your system hung up and is not operated for three minutes and over,
reset the system and restart setting procedures.

FIGURE 2.39 Boot device setting (15)

15. For a multipath configuration, make the settings described in the sections from 2.1.3 Starting the HBA setup utility to
    2.1.7 Speed and Topology settings for all the HBAs connected to the SAN storage unit LUN from which the system is
    started. Also, after installing the operating system and multipath driver, perform the operation described in 3.1.8 Boot
    device setting for all the HBAs used to start the system.
    After finishing all the settings, select [Exit Emulex HBA Configuration Utility], and then press the [Enter] key to return to
    the Device Manager menu.

Note

If following message appears following the operations below, press the [N] key or [ESC] key.

> Changes have not saved. Save Changes and exit?
>
> Press 'Y' save and exit, 'N' to discard and exit, 'ESC' to cancel.

You need not perform another operation here because the [Commit Changes] or [Discard Changes] operation from the
menu completes the task of changing or discarding settings.

Select the relevant item from the [Delete Boot Device] or [Change Boot Device Order] menu.

↓

Select [Commit Changes] or [Discard Changes].

↓

Go back to the [Delete Boot Device] or [Change Boot Device Order] menu.

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2.1.9 Applying settings

Restart the system to apply the changes in the settings.

To restart the system, use the following procedure, or select [Reset] from the [Power Control] window of the MMB Web-UI.

1. Press the [Esc] key to go to the Boot Manager Front Page.

FIGURE 2.40 Restarting the system (1)

2. Select [Boot Maintenance Manager], and then press the [Enter] key to go to the [Boot Maintenance Manager] screen.

FIGURE 2.41 Restarting the system (2)

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3. Select [Reset System], and then press the [Enter] key. The system is restarted.
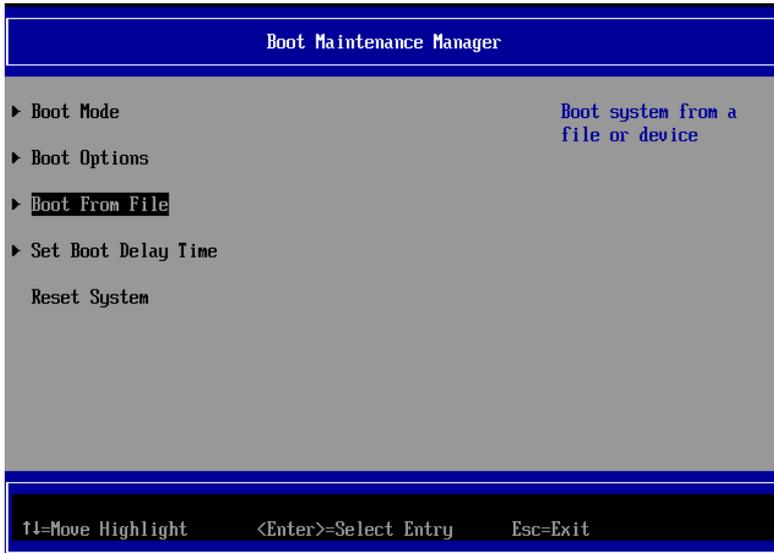
FIGURE 2.42 Restarting the system (3)

4. Please push either of key (space key) while the FUJITSU logo is displayed. 'Enter' is excluded.

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2.1.10 Recording the WWN of the FC port

According to the design drawing of the SAN boot environment, write down the WWN (World Wide Name), specific address information assigned to the FC port of the 8Gbps FC Card of each server.

Confirm the WWN with [Port Name] in the [Adapter Selection] menu. The menu appears after the [Emulex Configuration Utility] restart.

```
                          Device Manager

   Devices List                          Emulex HBA
 ▶ System Information                     Configuration Utility
 ▶ iSCSI Configuration                    HELP
 ▶ CPU Configuration
 ▶ Memory Configuration
 ▶ USB Configuration
 ▶ Security Configuration
 ▶ sadump Configuration
 ▶ Network Device List
 ▶ Emulex  001: LPe12002-M8     PCIe2.5Gb/s , x8
   WWN:10000000C9881A6E
 ▶ Emulex  002: LPe12002-M8     PCIe2.5Gb/s , x8
   WWN:10000000C9881A6F
 ▶ Port 001:Emulex LPe16002-M6 PCIe 2-port 16Gb Fibre
   Channel
                                                     ↓

 ↑↓=Move Highlight      <Enter>=Select Entry     Esc=Exit
```

FIGURE 2.43 Device Manager menu

Remarks

If you are updating 8Gbps FC Card firmware (e.g., Boot BIOS), check the WWN after the firmware update.

To clearly identify the mounting location of the 8Gbps FC Card, record the host name (the one that identifies the PRIMEQUEST 2000 series server), mounted card, mounting slot location, BUS number, and DEV number. For the BUS number and slot number, check the BUS number and slot number of the target HBA from the [IOU] menu and [PCI_Box] menu of the MMB Web-UI.

The BUS number appears as the middle number of the three numbers delimited by slash in the [Seg/Bus/Dev] item. The following example shows how the WWNs are recorded.

TABLE 2.1 WWN recording example

Host name (to identify a server)	Mounted card (type)	PCI	FC port
		BUS-DEV	WWN
Server #1	MC-0JFC21	0x - 00	10 00 00 00 C9 **
		0x - 00	10 00 00 00 C9 **
Server #2	MC-0JFC21	0x - 00	10 00 00 00 C9 **
		0x - 00	10 00 00 00 C9 **
:	:	:	:
:	:	:	:

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Notes

- Always keep the WWN information up to date, and share and manage it together with the SAN boot systemadministrator and maintenance personnel.
- If the WWN information is wrong, connection to the SAN storage is disabled and problems such as being unable to start the operating system occur.
- When an 8Gbps FC Card is moved or hardware is replaced for maintenance purposes, the WWN may be changed.

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2.2 Procedure for Setting Legacy BIOS Driver Version 3.20a5 or Later on the 8Gbps FC Card

This section describes the procedure for setting Legacy BIOS driver version 3.20a5 or later.

2.2.1 Setting the Legacy BIOS Driver Boot

1. Select [Device Manager], and then press the [Enter] key.

```
        Continue                                This selection will
      ▶ Boot Manager                            take you to the
      ▶ Device Manager                          Device Manager
      ▶ Boot Maintenance Manager
      ▶ BIOS Boot Diagnostic Test
```
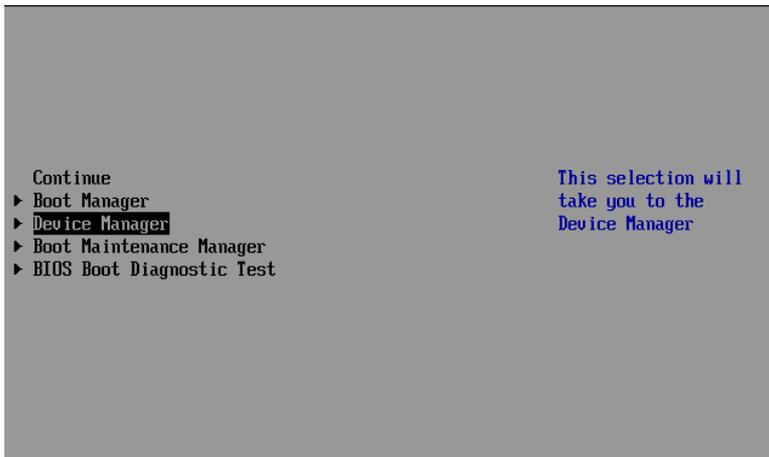
FIGURE 2.44 Device Manager menu

2. Select [PCI Subsystem Configuration], and then press the [Enter] key.

```
                         Device Manager

                                                 ↑
      ▶ USB Configuration                        PCI, PCI-X and PCI
      ▶ sadump Configuration                     Express Settings.
      ▶ Network Device List
      ▶ Emulex  001: LPe12002      PCIe2.5Gb/s , x8
        WWN:10000000C9BA8298
      ▶ Emulex  002: LPe12002      PCIe2.5Gb/s , x8
        WWN:10000000C9BA8299
      ▶ Port 001:Emulex LPe16002B-M6-F 16Gb 2-port PCIe
        Fibre Chann
      ▶ Port 002:Emulex LPe16002B-M6-F 16Gb 2-port PCIe
        Fibre Chann
      ▶ LSI MegaRAID <RAID Ctrl SAS 6G 1GB (D3116C)>
        Configuration Utility - 03.02.03.00
      ▶ PCI Subsystem Configuration
      ▶ LAN Remote Boot Configuration
                                                 ↓

       ↑↓=Move Highlight     <Enter>=Select Entry     Esc=Exit
```

FIGURE 2.45 Device Manager

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3.   Select [PCI ROM Priority], and changes from [EFI Compatible ROM] to] Legacy ROM].

```
                    PCI Subsystem Configuration

   PCI Subsystem Configuration                 In case of multiple
                                               Option ROMs (Legacy
   PCI ROM Priority          <EFI Compatible ROM>  and EFI Compatible),
   ASPM Support              <Disabled>         specifies what PCI
   Number of bus# padded to  <1>                Option ROM to launch.
   slot
 ▶ OpROM Scan Configuration  ┌─────────────────────┐
 ▶ I/O Space Assignment Con  │ Legacy ROM          │
                             │ EFI Compatible ROM  │
   Commit Changes and Exit   └─────────────────────┘
   Discard Changes and Exit




   ↑↓=Move Highlight     <Enter>=Complete Entry   Esc=Exit Entry
```

FIGURE 2.46 PCI Subsystem Configuration (1)

4.   Select [Commit Changes and Exit], and then save setting.

```
                    PCI Subsystem Configuration

   PCI Subsystem Configuration

   PCI ROM Priority          <Legacy ROM>
   ASPM Support              <Disabled>
   Number of bus# padded to  <1>
   slot
 ▶ OpROM Scan Configuration
 ▶ I/O Space Assignment Configuration

   Commit Changes and Exit
   Discard Changes and Exit




   ↑↓=Move Highlight     <Enter>=Select Entry    Esc=Exit
```
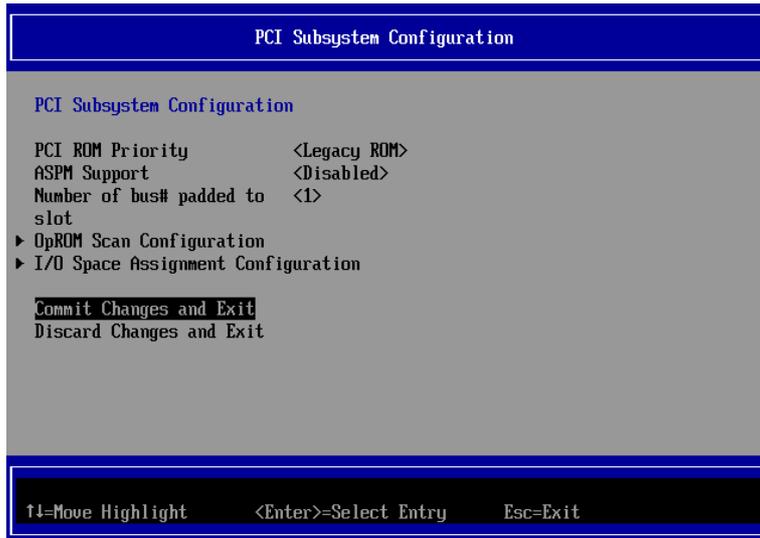
FIGURE 2.47 PCI Subsystem Configuration (2)

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5.   press the [ESC] key, back to [EFI Boot Manager] and Select [continue], and then press the [Enter] key.
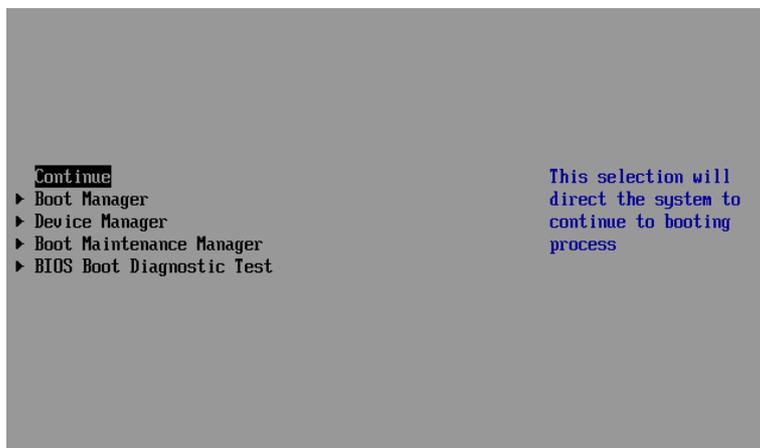
FIGURE 2.48 EFI Boot Manager menu

6.   The following messages are displayed, press the [Enter] key and system reboot.
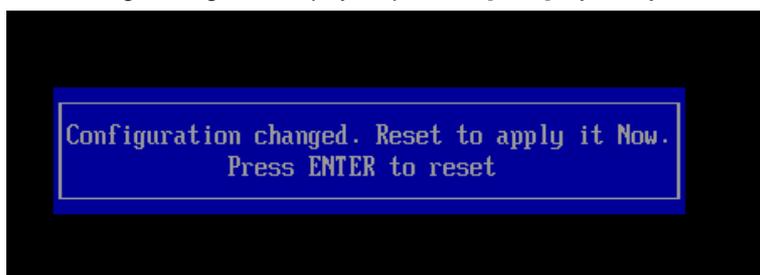
FIGURE 2.49 Legacy BIOS Driver Boot Setting

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2.2.2   Setting of the OpROM Scan Configuration

Installed HBA is read with Legacy BIOS. then, the [OpROM Scan Configuration] setting of the PCI slot.

1. Select [Device Manager], and then press the [Enter] key.
2. Select [PCI Subsystem Configuration], and then press the [Enter] key.
3. Select [OpROM Scan Configuration], and then press the [Enter] key.

```
                     PCI Subsystem Configuration


   PCI Subsystem Configuration                 Enable or disable
                                               option ROM execution
   PCI ROM Priority          <Legacy ROM>      for device.
   ASPM Support              <Disabled>
   Number of bus# padded to  <1>
   slot
 ▶ OpROM Scan Configuration
 ▶ I/O Space Assignment Configuration

   Commit Changes and Exit
   Discard Changes and Exit




   ↑↓=Move Highlight      <Enter>=Select Entry     Esc=Exit
```
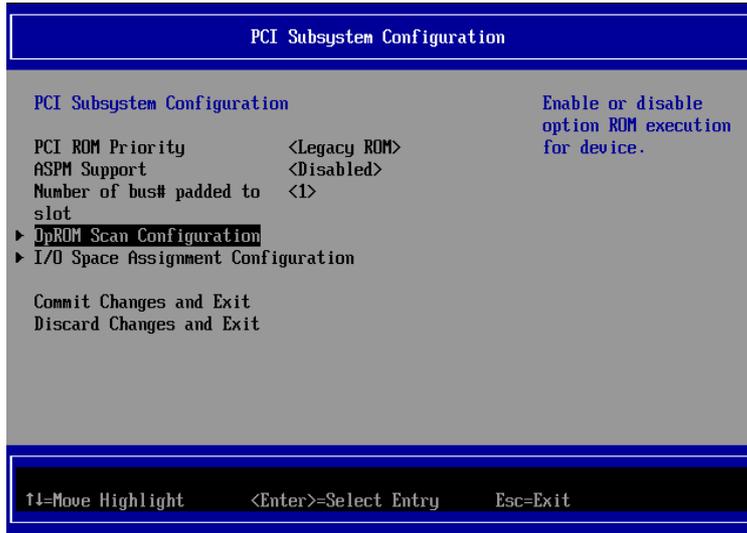
FIGURE 2.50 PCI Subsystem Configuration

4. The slot number equipped with HBA is changed from [Disabled] to [Enabled].

```
                     PCI Subsystem Configuration


   PCI Subsystem Configuration                 Enable or disable
                                               option ROM execution
   PCI ROM Priority          <Legacy ROM>      for device.
   ASPM Support              <Disabled>
   Number of bus# padded to  <1>
   slot
 ▶ OpROM Scan Configuration
 ▶ I/O Space Assignment Configuration

   Commit Changes and Exit
   Discard Changes and Exit




   ↑↓=Move Highlight      <Enter>=Select Entry     Esc=Exit
```
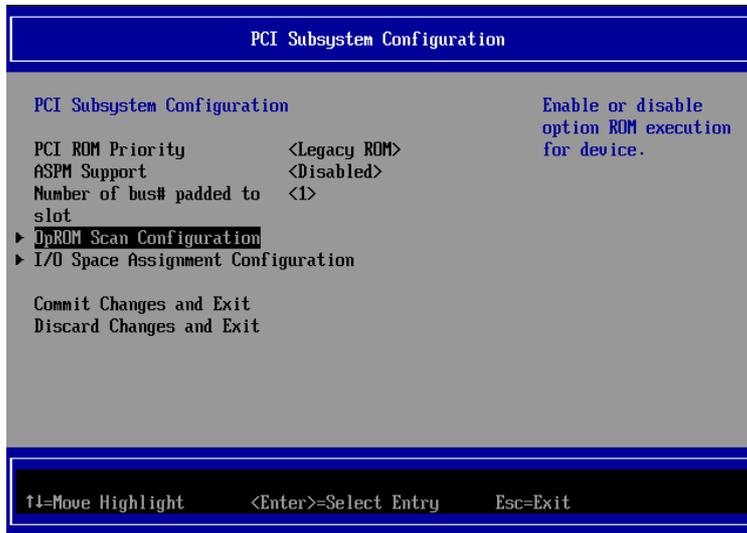
FIGURE 2.51 OpROM Scan Configuration (1)

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5.   Check the setting has been changed to [Enabled].

```
┌─────────────────────────────────────────────────────────────────┐
│                     OpROM Scan Configuration                      │
├─────────────────────────────────────────────────────────────────┤
│                                                                   │
│   Onboard RAID OpROM      <Enabled>           Enable or disable   │
│   IOU#0                                        option ROM execution│
│   DUSlot#0 OpROM          <Enabled>           for device in this  │
│   Slot#0 OpROM            <Enabled>           slot.               │
│   Slot#1 OpROM            <Disabled>                              │
│   Slot#2 OpROM            <Disabled>                              │
│   Slot#3 OpROM            <Disabled>                              │
│   IOU#1                                                           │
│   DUSlot#1 OpROM          <Enabled>                              │
│   Slot#0 OpROM            <Disabled>                              │
│   Slot#1 OpROM            <Disabled>                              │
│   Slot#2 OpROM            <Disabled>                              │
│   Slot#3 OpROM            <Disabled>                              │
│   IOU#2                                                           │
│   DUSlot#0 OpROM          <Enabled>                              │
│                                                    ↓              │
│                                                                   │
├─────────────────────────────────────────────────────────────────┤
│   ↑↓=Move Highlight     <Enter>=Select Entry     Esc=Exit        │
└─────────────────────────────────────────────────────────────────┘
```
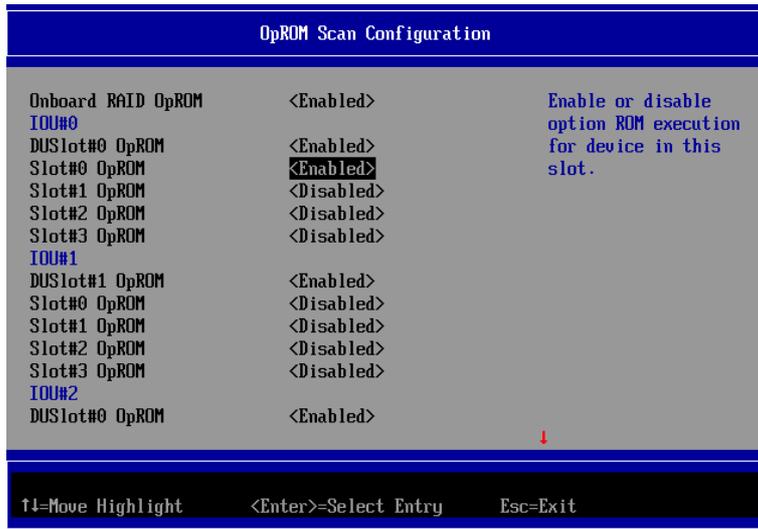
FIGURE 2.52 OpROM Scan Configuration (2)

6.   Press [ESC] key two times. And, the setting is saved. (Press [Y] key) Then, go to back [Device Manager] screen.

```
┌─────────────────────────────────────────────────────────────────┐
│                     PCI Subsystem Configuration                   │
├─────────────────────────────────────────────────────────────────┤
│                                                                   │
│   PCI Subsystem Configuration                 Enable or disable   │
│                                               option ROM execution│
│   PCI ROM Priority        <Legacy ROM>        for device.        │
│   ASPM Support            <Disabled>                             │
│   Nu┌──────────────────────────────────────────────────┐        │
│   sl│   Changes have not saved. Save Changes and exit?  │        │
│ ▶ Op│ Press 'Y' to save and exit, 'N' to discard and exit, 'ESC' to cancel.│ │
│ ▶ I/│                                                   │        │
│     └──────────────────────────────────────────────────┘        │
│   Co                                                             │
│   Discard Changes and Exit                                      │
│                                                                   │
│                                                                   │
├─────────────────────────────────────────────────────────────────┤
│   ↑↓=Move Highlight     <Enter>=Select Entry     Esc=Exit        │
└─────────────────────────────────────────────────────────────────┘
```
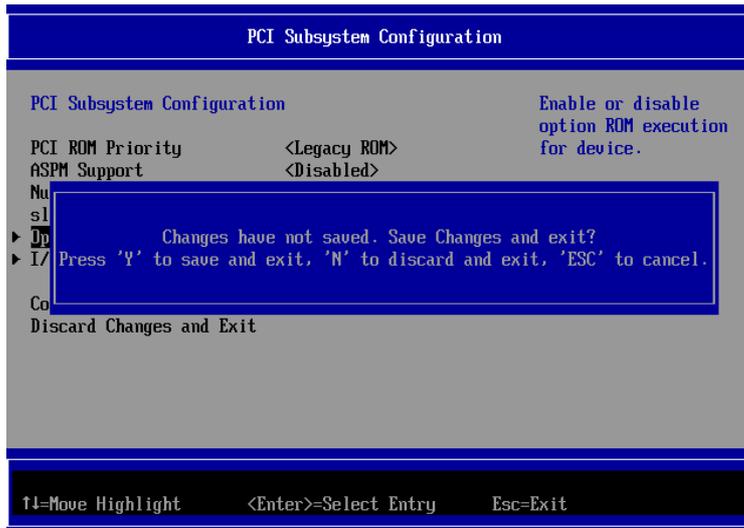
FIGURE 2.53 OpROM Scan Configuration (3)

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2.2.3 Starting the HBA Setup Utility

1. Press [Alt]+ [E] or [Ctrl]+ [E] key during the following massage appears.

```
Emulex LightPulse FC BIOS, Version 3.20a5
Copyright (c) 1997-2012 Emulex. All rights reserved.

Press <Alt E> or <Ctrl E> to enter Emulex BIOS configuration
utility. Press <s> to skip Emulex BIOS

Emulex FC BIOS configuration utility selected
Bringing the Link up, Please wait...
_
```
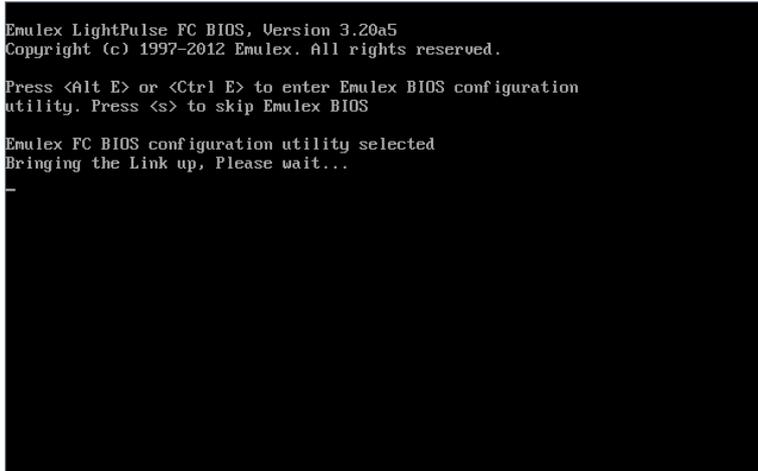
FIGURE 2.54 Stating Legacy BIOS Setup

2. Start LightPluse BIOS Utility.

   FC ports of Fibre Channel Card appear in HBA Listing screen. Select a FC port to set up and press [Enter] key.

```
            Emulex LightPulse BIOS Utility, UB3.20a5

        This utility displays and saves changes when selected.
        You will be prompted to reboot for all changes to take effect.

             Emulex Adapters in the System:

    1. LPe12002:        Bus:05 Dev:00 Func:01   WWPN: 10000000C9BA8225
    2. LPe12002:        Bus:05 Dev:00 Func:00   WWPN: 10000000C9BA8224




        Enter <Esc> to exit  <PageDn> to Next Page
             <↑/↓> to Highlight, <Enter> to Select

        Copyright (c) 1997-2012 Emulex. All rights reserved.
```
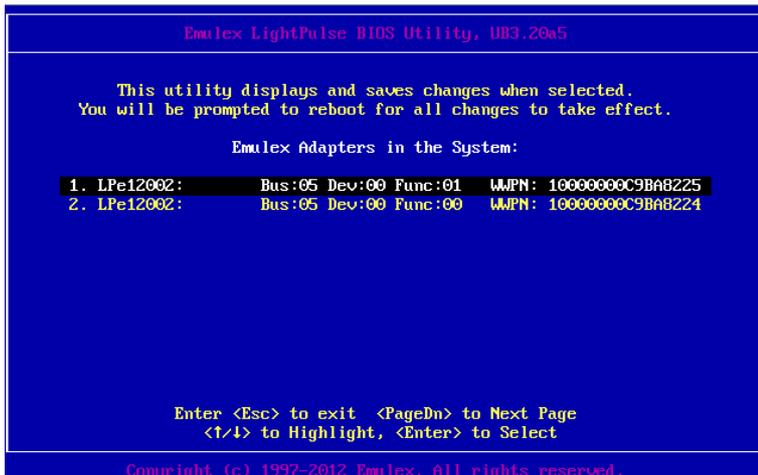
FIGURE 2.55 Emulex LighrPlus BIOS Utility(1)

3. Menu for the FC port selected in the previous screen appears. Memory Address (Mem Base), Firmware Version, WWPN (Port Name), WWNN (Node Name), and Topology for the FC port also appear.

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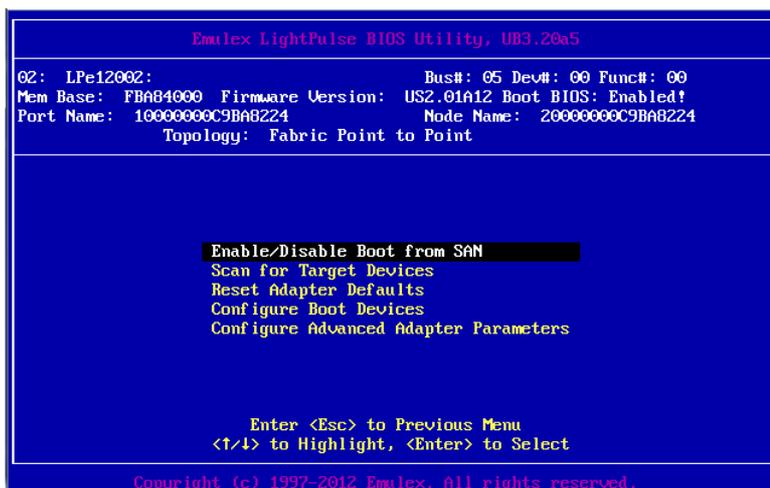
FIGURE 2.56 Emulex LighrPlus BIOS Utility(2)

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2.2.4   Enabling BIOS

Enable the HBA BIOS so that the HBA can recognize the LUNs of the SAN storage unit and to enable the system to be started from one of them.

1.   Select [Enable/Disable Boot form SAN], and then press the [Enter] key.
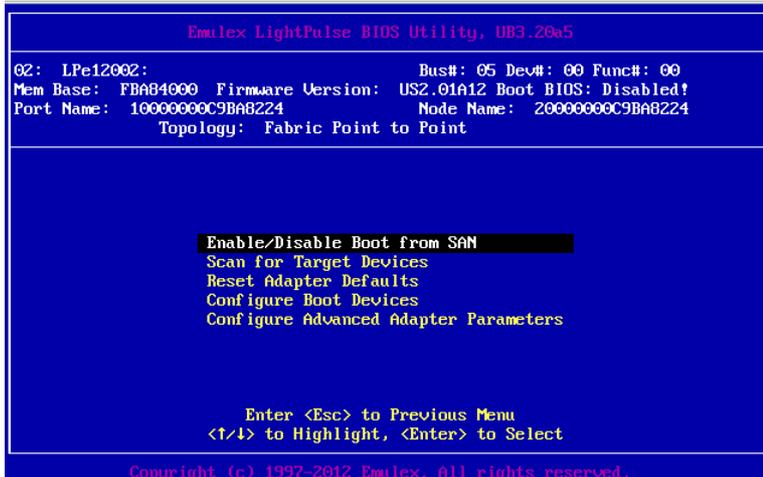
FIGURE 2.57 Enable/Disable Boot form SAN setup screen(1)

2.   Set [Boot BIOS] is "Enabled," and then press the [Enter] key.
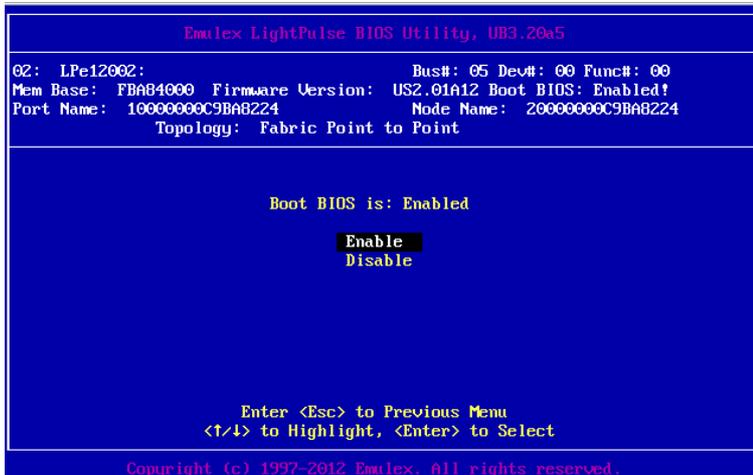
FIGURE 2.58 Enable/Disable Boot form SAN setup screen(2)

Note

Confirm that [Boot BIOS] is "Enabled."

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2.2.5 Link Speed and Topology Settings

The following describes how to make the Speed and Topology settings.

■Topology setting

1. Select [Configure Advance Adapter Parameters] form the Main menu, and then press the [Enter] key.
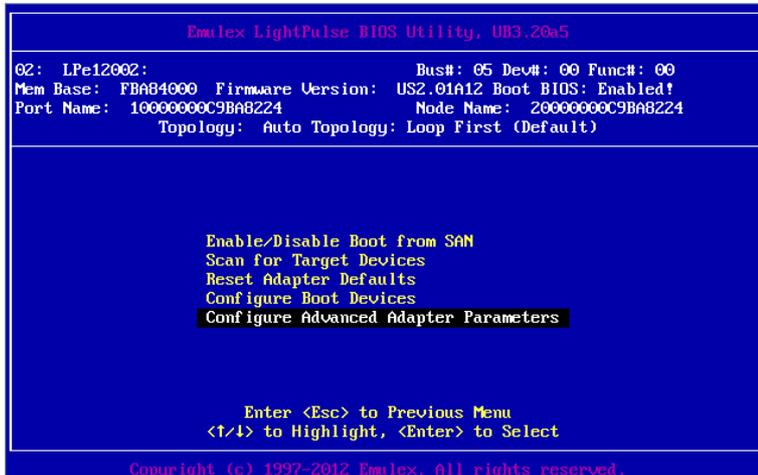
FIGURE 2.59 Topology Selection setting(1)

2. Select [Topology Selection], and then press the [Enter] key.
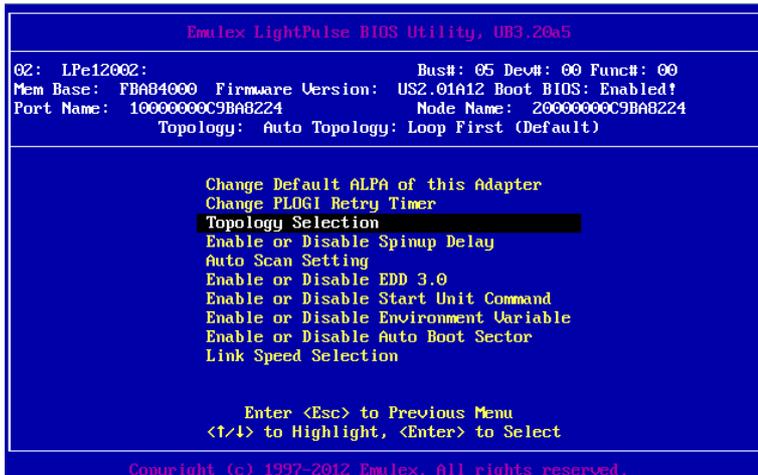
FIGURE 2.60 Topology Selection setting(2)

3. Select the connection method, and then press the [Enter] key. Change the setting from the default setting of [AUTO Loop First -default] as follows.

   Fabric connection: Point to Point.

   FCAL connection: FCAL

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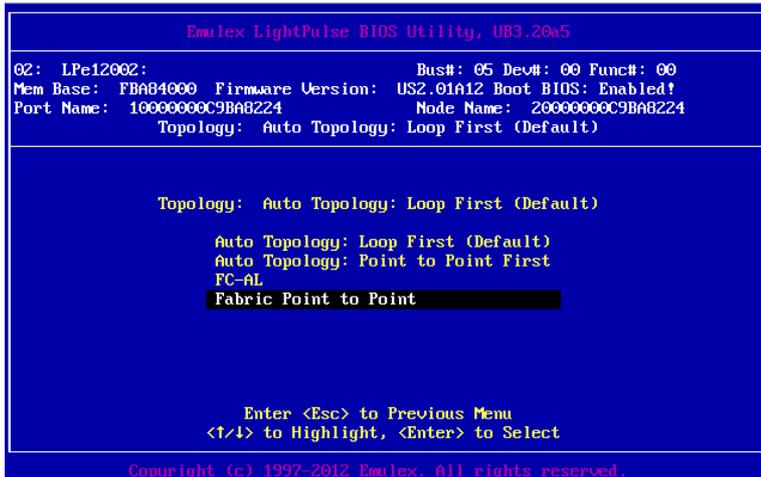
FIGURE 2.61 Fabric Point to Point Setting screen

■Link Speed setting

Note

Make the following setting that corresponds to the connection kink speed (2 Gbps/ 4 Gbps/ 8 Gbps).

Do not set [Auto select (Default)].

1.   Select [Configure Advance Adapter Parameters] from the Main menu and press the [Enter] key.
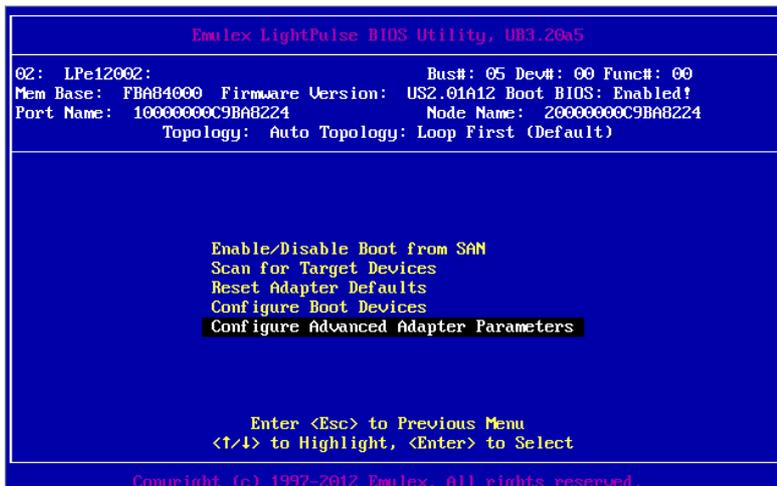
FIGURE 2.62 Configure Advanced Adapter Parameters Setting Screen

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2. Select [Link Speed Selection] in the following screen, and then press [Enter] key.

```
          Emulex LightPulse BIOS Utility, UB3.20a5

02: LPe12002:                          Bus#: 05 Dev#: 00 Func#: 00
Mem Base: FBA84000  Firmware Version:  US2.01A12 Boot BIOS: Enabled!
Port Name:  10000000C9BA8224           Node Name:  20000000C9BA8224
          Topology:  Fabric Point to Point


          Change Default ALPA of this Adapter
          Change PLOGI Retry Timer
          Topology Selection
          Enable or Disable Spinup Delay
          Auto Scan Setting
          Enable or Disable EDD 3.0
          Enable or Disable Start Unit Command
          Enable or Disable Environment Variable
          Enable or Disable Auto Boot Sector
          Link Speed Selection


              Enter <Esc> to Previous Menu
          <↑/↓> to Highlight, <Enter> to Select

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```

FIGURE 2.63 Link Speed Selection Setting screen(1)

3. Select the link speed corresponding to the connection environment (connected FC switch or SAN storage unit), and then press the [Enter] key.

```
          Emulex LightPulse BIOS Utility, UB3.20a5

02: LPe12002:                          Bus#: 05 Dev#: 00 Func#: 00
Mem Base: FBA84000 Firmware Version:  US2.01A12 Boot BIOS: Enabled!
Port Name:  10000000C9BA8224           Node Name:  20000000C9BA8224
          Topology:  Fabric Point to Point



          Link Speed is:    8 Gigabaud

              Auto Select (Default)
              2 Gigabaud
              4 Gigabaud
              8 Gigabaud




              Enter <Esc> to Previous Menu
          <↑/↓> to Highlight, <Enter> to Select

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```
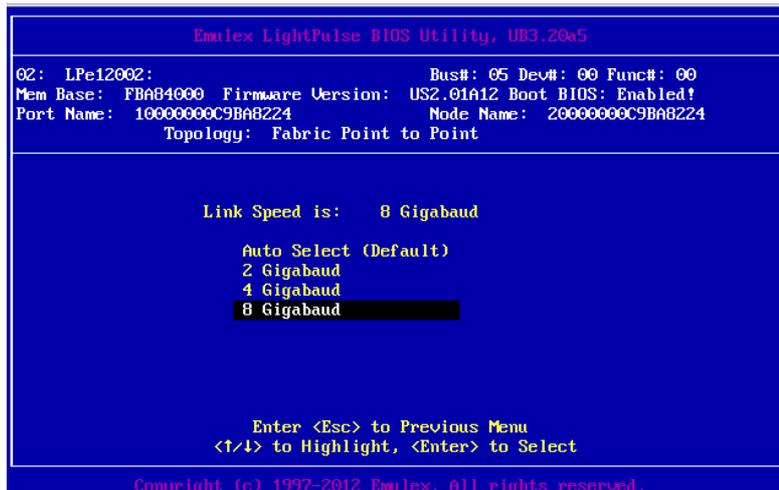
FIGURE 2.64 Link Speed Selection Setting screen(2)

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4. Press the [ESC] key three times to return LightPlus BIOS Utility.
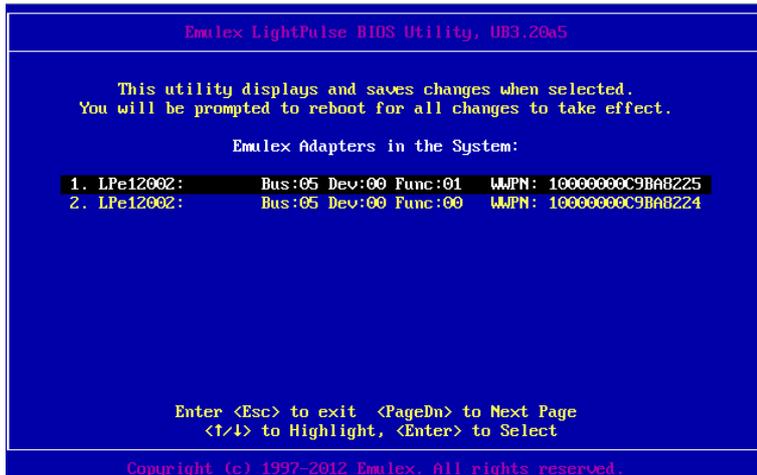
FIGURE 2.65 Emulex Lightplus BIOS Utility screen

5. Press the [ESC] key again. Press [Y] to reboot the system and save changes.
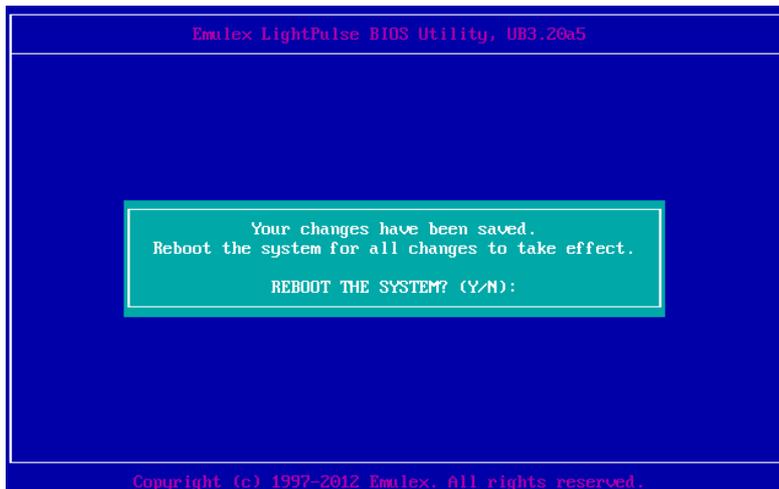
FIGURE 2.66 Saving Emulex Lightplus BIOS Setting

Changing the setting of the opposing device

The setting of the opposing Fibre Channel switch and SAN storage unit disk array must also be made static so that it corresponds to the static setting of the 8Gbps FC Card.

For details on the settings required on the ETERNUS when connecting to it, see the ETERNUS manuals at the following website:

http://www.fujitsu.com/global/support/products/computing/storage/disk/manuals/

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2.2.6 Boot device setting

1. Select connect boot device from the FC port, and then press the [Enter] key.

FIGURE 2.67 BOIS device setting (1)

2. Select [Configure Boot Devices] form the Main menu, and then press the [Enter] key.

FIGURE 2.68 BOIS device setting (2)

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3. Select [Primary Boot], and then press the [Enter] key.

```
Emulex LightPulse BIOS Utility, UB3.20a5

02:  LPe12002:                        Bus#: 05 Dev#: 00 Func#: 00
Mem Base:  FBA84000  Firmware Version:  US2.01A12 Boot BIOS: Enabled!
Port Name:  10000000C9BA8224             Node Name:  20000000C9BA8224
          Topology:  Auto Topology: Loop First (Default)


                 List of Saved Boot Devices:

        1. Unused   DID:000000 WWPN:00000000 00000000 LUN:00  Primary Boot
        2. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
        3. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
        4. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
        5. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
        6. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
        7. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
        8. Unused   DID:000000 WWPN:00000000 00000000 LUN:00        _



            <↑/↓> to Highlight, <Enter> to Select

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```

FIGURE 2.69 BOIS device setting (3)

4. Select the Boot device (FUJITSU ETERNUS_DXL), and then press the [Enter] key.

```
Emulex LightPulse BIOS Utility, UB3.20a5

01:  LPe12002-M8:                     Bus#: C4 Dev#: 00 Func#: 00
Mem Base:  92F04000  Firmware Version:  US2.01A12 Boot BIOS: Enabled!
Port Name:  10000000C97D25A2             Node Name:  20000000C97D25A2
          Topology:  Auto Topology: Loop First (Default)




    00. Clear selected boot entry!!
    01. ALPA:EF(FF) WWPN:500000E0 D44D5481 LUN:00   FUJITSU ETERNUS_DXL     0000








         Enter <ESC> to Exit   <PageDn> to NextPage
            <↑/↓> to Highlight, <Enter> to Select

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```

FIGURE 2.70 BOIS device setting (4)

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5. Device information is displayed, and then press the [Enter] key.

```
Emulex LightPulse BIOS Utility, UB3.20a5

01: LPe12002-M8:                        Bus#: C4 Dev#: 00 Func#: 00
Mem Base:  92F04000  Firmware Version:  US2.01A12 Boot BIOS: Enabled!
Port Name:  10000000C97D25A2              Node Name:  20000000C97D25A2
           Topology:  Auto Topology: Loop First (Default)


        ALPA:EF(FF) WWPN:500000E0 D44D5481

     Enter two digits of starting LUN (Hex):   00


              <ESC> to Previous Menu



     Enter <ESC> to Exit    <PageDn> to NextPage
         <↑/↓> to Highlight, <Enter> to Select
     Copyright (c) 1997-2012 Emulex. All rights reserved.
```

FIGURE 2.71 BOIS device setting (5)

6. Select the device that registers.

```
Emulex LightPulse BIOS Utility, UB3.20a5

01: LPe12002-M8:                        Bus#: C4 Dev#: 00 Func#: 00
Mem Base:  92F04000  Firmware Version:  US2.01A12 Boot BIOS: Enabled!
Port Name:  10000000C97D25A2              Node Name:  20000000C97D25A2
           Topology:  Auto Topology: Loop First (Default)

  ALPA:EF SelectID:FF     WWPN:500000E0 D44D5481

  01.     LUN:00              FUJITSU ETERNUS_DXL      0000






     Enter <ESC> to Exit    <PageDn> to NextPage
         <↑/↓> to Highlight, <Enter> to Select
     Copyright (c) 1997-2012 Emulex. All rights reserved.
```

FIGURE 2.72 BOIS device setting (6)

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7.   Select [Boot this device via WWPN], and then press the [Enter] key.
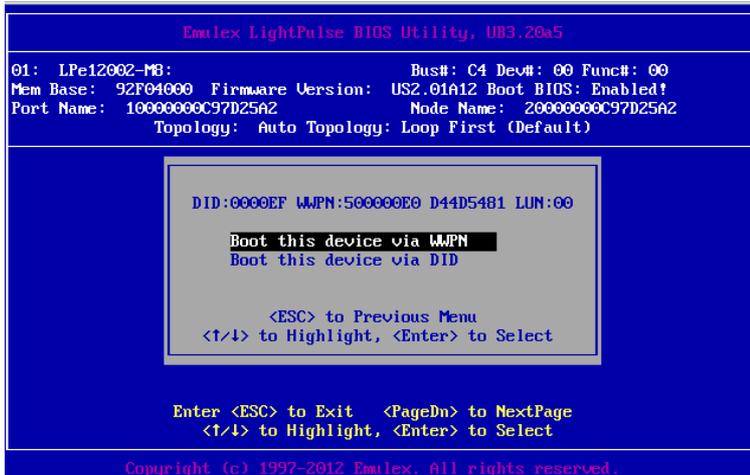
FIGURE 2.73 BOIS device setting (7)

8.   The boot device is added.

FIGURE 2.74 BOIS device setting (8)

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9. Press the [Enter] key, then Select [Scan for Target Devices] form the Main menu, and then press the [Enter] key.
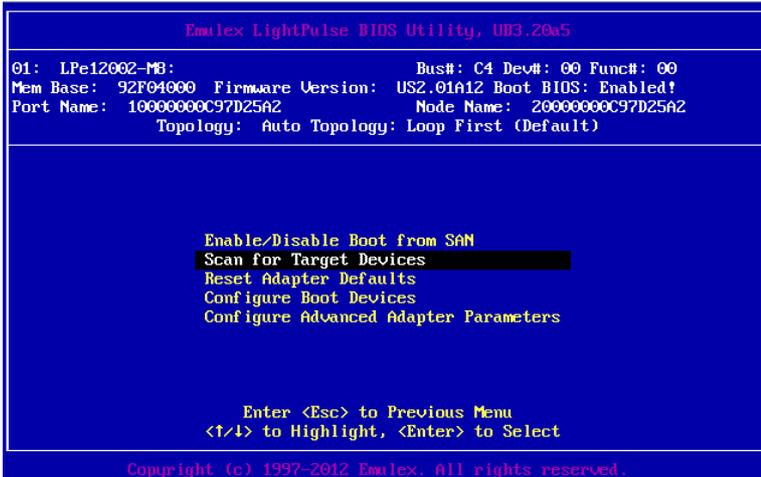
FIGURE 2.75 BOIS device setting (9)

10. The search result of the boot device is displayed.
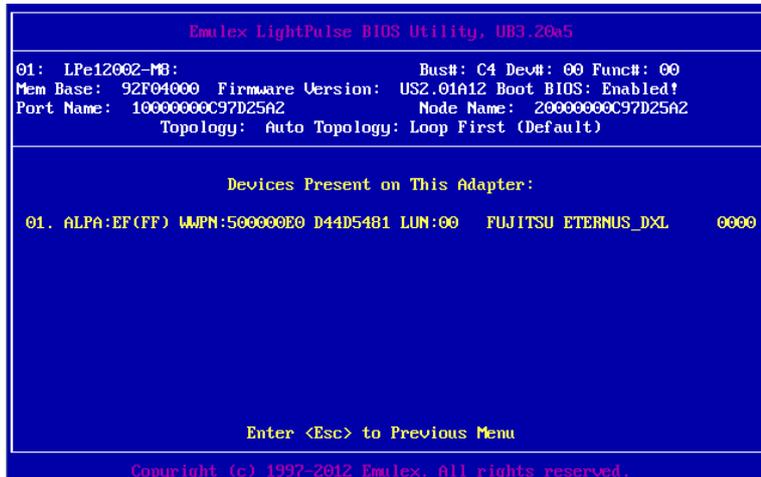
FIGURE 2.76 BOIS device setting (10)

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11. Press the [ESC] key, then returns to the Main menu.
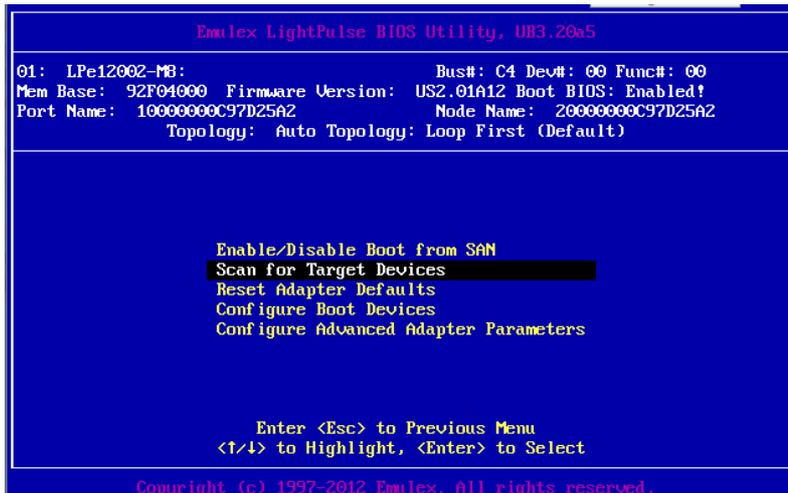
FIGURE 2.77 BOIS device setting (11)

Remarks

If the expected Fibre Device is not displayed, there is a possibility that the setting of the SAN storage or the setting or physical connection of the FC switch is incorrect.

Confirm these settings once again.

12. Press the [ESC] key, then message to save the setting is displayed. Then, returns to the [Device Manager].

13. For a multipath configuration, make the settings described in the sections from 2.2.2 Starting the HBA setup utility to 2.2.4 Link Speed and Topology settings for all the HBAs connected to the SAN storage unit LUN from which the system is started. Also, after installing the operating system and multipath driver, perform the operation described in 2.2.5 Boot device setting for all the HBAs used to start the system.

After finishing all the settings, select [Exit Emulex HBA Configuration Utility], and then press the [Enter] key to return to the Device Manager menu.

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CHAPTER 3 Settings on the Fibre Channel Card (16Gbps FC Card)

This chapter describes the settings to be made on the 16Gbps FC Card in the PRIMEQUEST 2000 series server. With the resultant settings, the system starts from an LUN of the SAN storage unit in the FC SAN boot environment.

3.1 Procedure for Setting UEFI Driver Version 6.11a5 or Later on the 16Gbps FC Card

This section describes the procedure for setting UEFI driver version 6.11a5 or later.

To have the system start from a LUN of the SAN storage unit in the SAN boot environment, the operation described below is required for all of the HBAs to be used for starting the system.
Executing this operation registers in the HBA the SAN storage unit LUN from which the system is to be started. This section uses examples of screen displays resulting from the use of UEFI driver versions 6.11a3.
All screenshots appearing below are display examples whose contents vary depending on the system configuration, etc.

Notes
- To add sadump as dump device of SAN, setting LUN by selecting [Add Boot Device] on the UEFI driver utility is required.
- Setting of FC card has to be done on each port.
  When the setting is adding changed by the above-mentioned, the partition rebooting is necessary.
  please execute the action after rebooting a pertinent partition.
  Please push either of key (space key) while the FUJITSU logo is displayed. 'Enter' is excluded.

When the above-mentioned is not done, the dump device is not added.

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· Different 16Gbps FC Card firmware versions cannot be mixed in a single partition. Moreover, different UEFI driver versions cannot be mixed in a single partition. If you have different versions of the 16Gbps FC Card firmware or UEFI driver, install the same version of the firmware driver, respectively.

3.1.1   Selecting the Method of Making Settings for the 16Gbps FC Card

Check the UEFI driver version from the [Device Manager] screen of the Boot Manager Front Page.

1. Select [Force boot into EFI Boot Manager] from [Boot Selector] in the [Power Control] window of the MMB. Then, turn on the power. Start the UEFI Shell.
2. The Boot Manager Front Page appears. Select [Device Manager], and then press the [Enter] key.
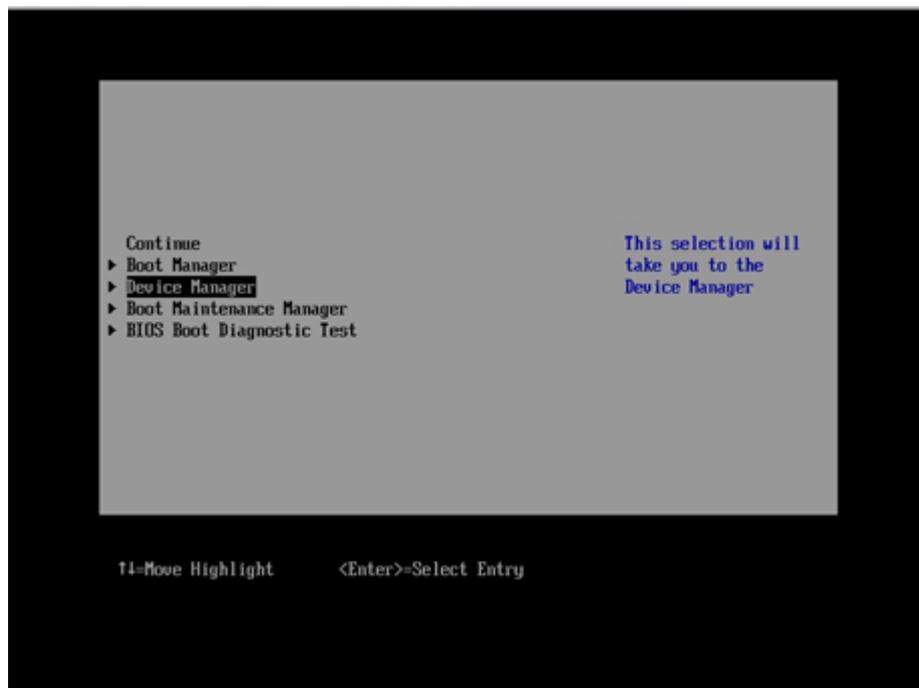
FIGURE 3.1 Boot Manager front page (screen display example)

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3. The [Device Manager] screen appears.

FIGURE 3.2 [Device List]

** The order of device may vary each time you enter into Device Mangager menu.

Note

The following points when using UEFI driver version 6.11a5 or later to set a SAN boot configuration on the 16Gbps FC Card.
   Refer to [Display Adapter Info] in the [Port 001:Emulex LPe16002B-M6-F 16Gb 2-port PCIe Fibre Chann] screen to check
   the UEFI driver version.

·   Before deleting a registered boot entry with the Delete Boot Device process, be sure to change the BIOS enable
    setting (Set Boot from SAN) to Disable.
·   Executing the Delete Boot Device process with Enable as the BIOS enable setting (Set Boot from SAN) may render
    Emulex Configuration Utility inoperable on rare occasions. In such cases, select [Reset] from the [Power Control]
    window of the MMB Web-UI to restart the system. Then, make the settings on the 16Gbps FC Card again.

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3.1.2   Displaying the Device Manager

1.   Select [Device Manager], and then press the [Enter] key.

FIGURE 3.3 Boot Manager front page (screen display example)

2.   The [Device Manager] screen appears.

3.1.3   Starting the HBA Setup Utility and Selecting an HBA

1. HBA list to be set is displayed on [Device Manager] screen.
2. Select [Port 001:Emulex LPe16002B-M6-F 16Gb 2-port PCIe Fibre Chann..] screen, and then press the [Enter] key
   (Above is the example where port 0 of LPE16002B-M6-F Dual port FC Card) is selected.)

FIGURE 3.4 Device Manager screen (HBA list)

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3.1.4   Acquiring an HBA WWN

Confirm the WWN of the HBA for which setup is currently being performed.

The WWN of the HBA is displayed as [LPE16xxx Node Name].

FIGURE 3.5 [Port 001:Emulex LPe16002B-M6-F 16Gb 2-port PCIe Fibre Chann] screen

The MMB Web-UI displays the slot containing the mounted HBA as the [PCI-Express Slots] item whose [Seg/Bus/Dev] values match the Seg#, Bus#, and Dev# values on the screen shown in FIGURE 3.5 [Port 001:Emulex LPe16002B-M6-F 16Gb 2-port PCIe Fibre Chann] screen.

Remarks

The [IOU] and [PCI_Box] screens of the System menu display the [PCI-Express Slots] items.

The [Emulex FC EFI-Bios Utility] screen uses hexadecimal notation for the displayed values, and the MMB Web-UI uses decimal notation.

For details on mounting locations, see APPENDIX B Physical Mounting Locations and Port Numbers in the *PRIMEQUEST 2000 Series Administration Manual* (C92344-0537).

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PCI-Express Slots

PCI Slot#	Power Status	Slot Status	Link Width	Seg/Bus/Dev	PCI-Express Card Information
					Firmware Version
0	Standby	Not-present			
1	On	OK	x8	0/13/0	-
					-
2	On	OK	x8	0/14/0	-
					-
3	Standby	Not-present			

FIGURE 3.6 MMB Web-UI display

3.1.5 Initializing the HBA Setting

Restore the HBA setting to the default state.

Remarks

An HBA that has just been shipped from the factory has initialized settings and does not require the work below.
Perform this work to initialize them again.

1. Select [Set Emulex Adapter to Default Settings], and then press the [Enter] key.
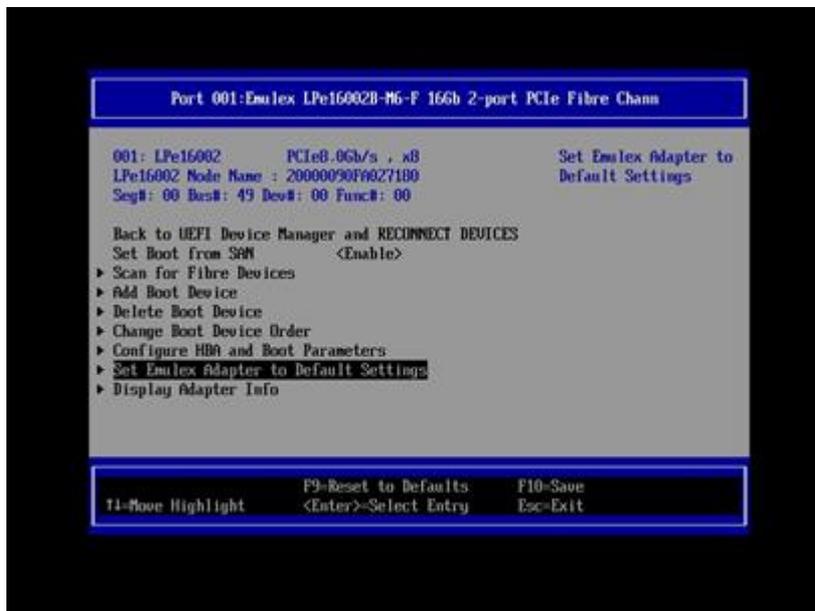
FIGURE 3.7 Menu for HBA setup

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2. The [Set Emulex Adapter to Default Settings] screen appears. Select [Set Adapter Defaults], and then press the [Enter] key.

FIGURE 3.8 [Set Emulex Adapter to Default Settings] screen

3. After the completion of initialization, you are returned to the [Adapter Selection] screen.

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3.1.6 Enabling BIOS

Enable the HBA BIOS so that the HBA can recognize the LUNs of the SAN storage unit and to enable the system to be started from one of them.

1. Select [Set Boot from SAN <Disable>] from the [Port 001:Emulex LPe16002B-M6-F 16Gb 2-port PCIe Fibre Chann] screen.

    The screen for selecting <Disable> or <Enable> appears. Select <Enable>, and then press the [Enter] key.

FIGURE 3.9 [Set Boot from SAN] (Enabling boot (1))

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2. Confirm that [Set Boot from SAN < Enable >] is displayed.
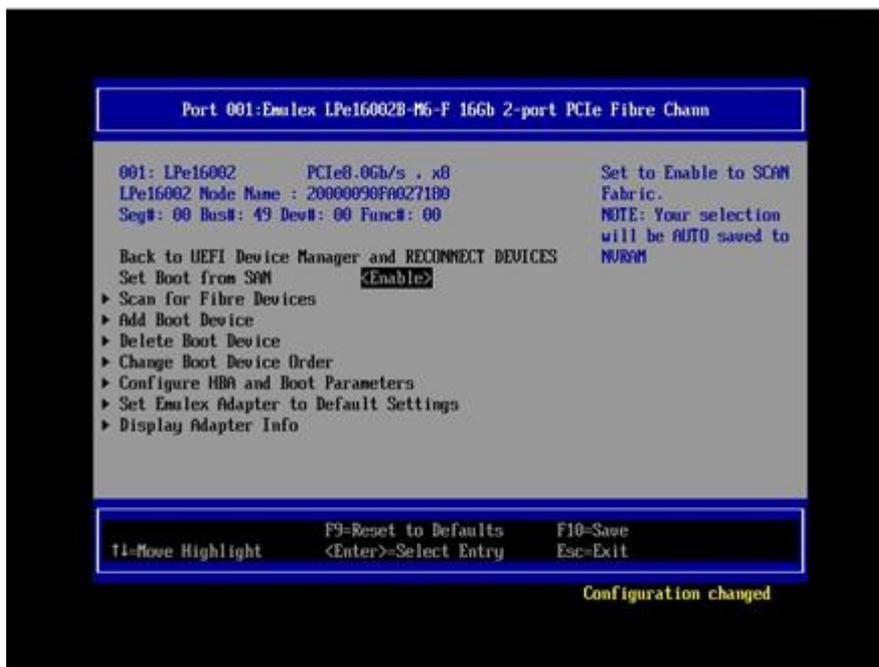
FIGURE 3.10 [Set Boot from SAN] (Enabling boot (2))

3.1.7 Link Speed and Topology settings

The following describes how to make the Link Speed and Topology settings.

Note

When you connect 16Gbps FC Card to the storage supporting 16Gbps, you have to connect via FC switch.

Note that conventional FCAL connection is not supported in above case. If you will use 16 Gbps FC card made the Link Speed slowed down into 4/8Gbps, FCAL connection can be available.

Static Topology setting

On the [Emulex Adapter Configuration Main Menu] screen, make the following setting that corresponds to the connection pattern (Fabric connection/FCAL connection).

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1. Select [Configure HBA and Boot Parameters], and then press the [Enter] key.

FIGURE 3.11 Static Topology setting (1)

2. Select [Topology Selection <AUTO Loop First –default>], and then press the [Enter] key.
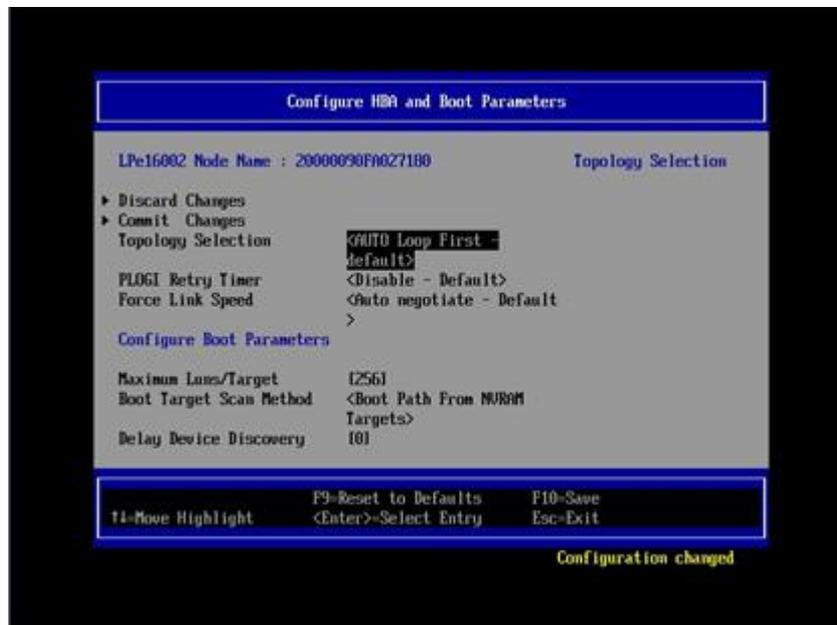
FIGURE 3.12 Static Topology setting (2)

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3. Select the connection method, and then press the [Enter] key. Change the setting from the default setting of [AUTO Loop First -default] as follows.
    Fabric connection: AUTO Point to Point first
    FCAL connection: FCAL (4Gbps/8Gbps only)
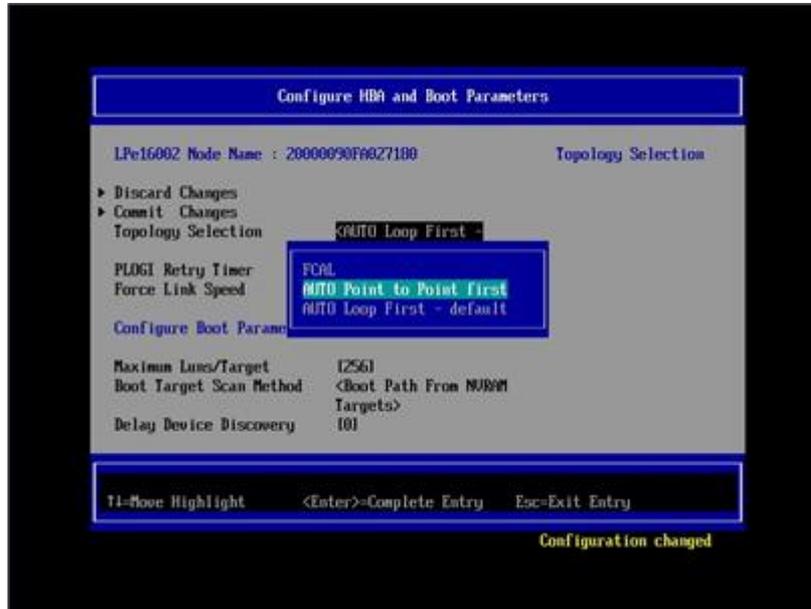
FIGURE 3.13 Selecting [Point to Point.]
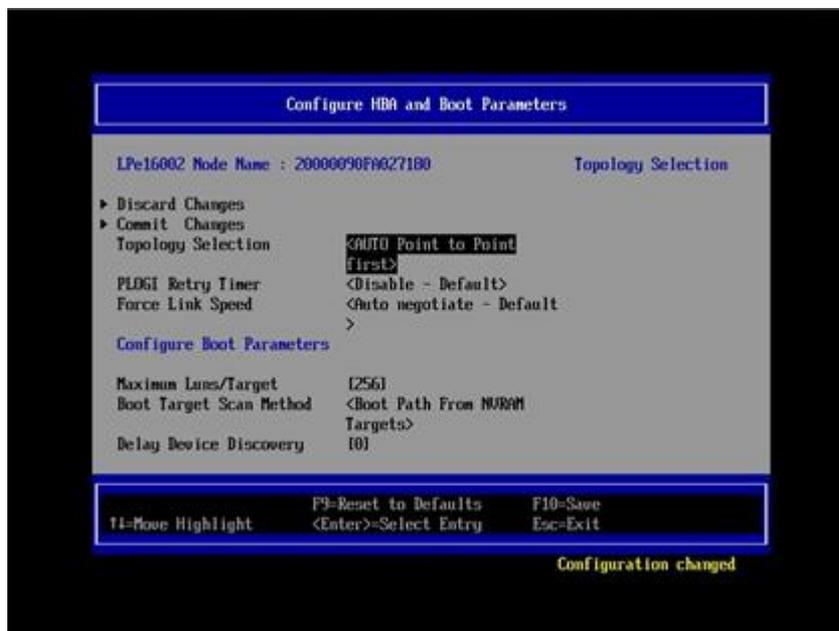
FIGURE 3.14 [Auto Point to Point.] displayed

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Static Link Speed setting

With EFI-Bios, make the following setting that corresponds to the connection link speed (4 Gbps/8 Gbps/16 Gbps).

Note

Do not set [Auto negotiate - Default]. First, make the fixed setting for Link Speed. Otherwise, the connected device will not be normally recognized

1. Select [Force Link Speed <Auto negotiate - Default>], and then press the [Enter] key.
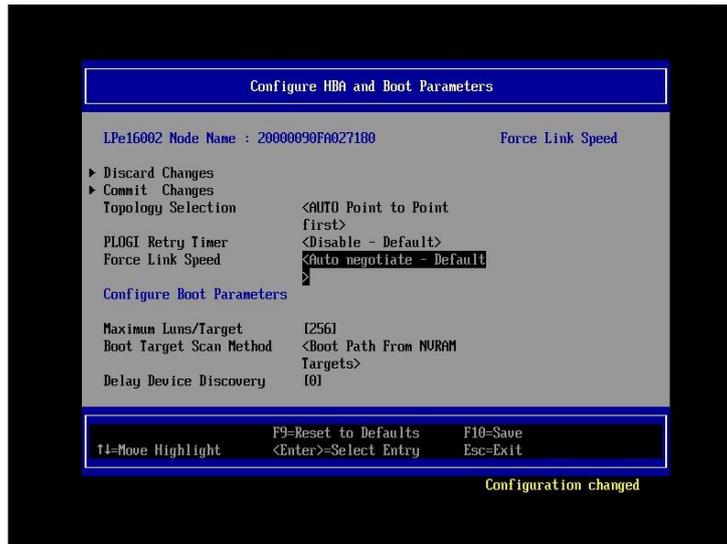
FIGURE 3.15 Static Link Speed setting (1)

2. Select the link speed corresponding to the connection environment (connected FC switch or SAN storage unit), and then press the [Enter] key.
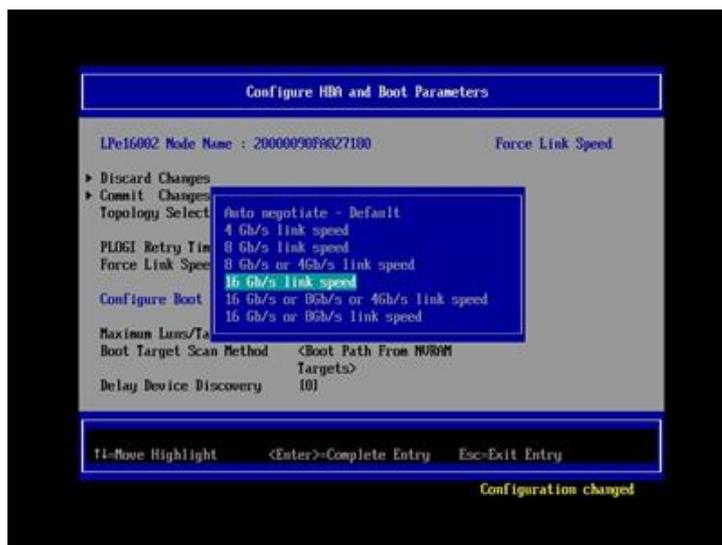
FIGURE 3.16 Static Link Speed setting (2)

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3. Confirm that the specified link speed is displayed for [Force Link speed <xxxxxxx>].
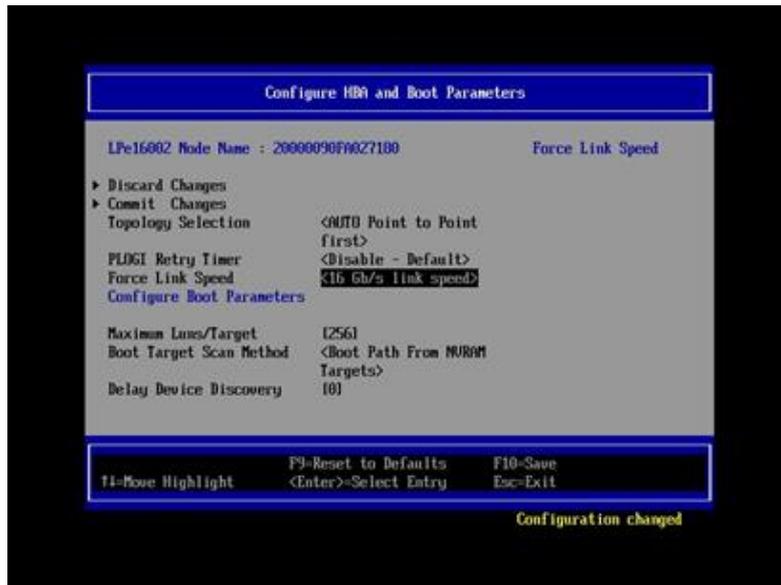
FIGURE 3.17 Static Link Speed setting (3)

4. Select [Commit Changes], and then press the [Enter] key.

FIGURE 3.18 Topology / Link Speed change confirmation (1)

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5. After the completion of the Commit Changes process, you are returned to the [Port 001:Emulex LPe16002B-M6-F 16Gb 2-port PCIe Fibre Chann] screen.
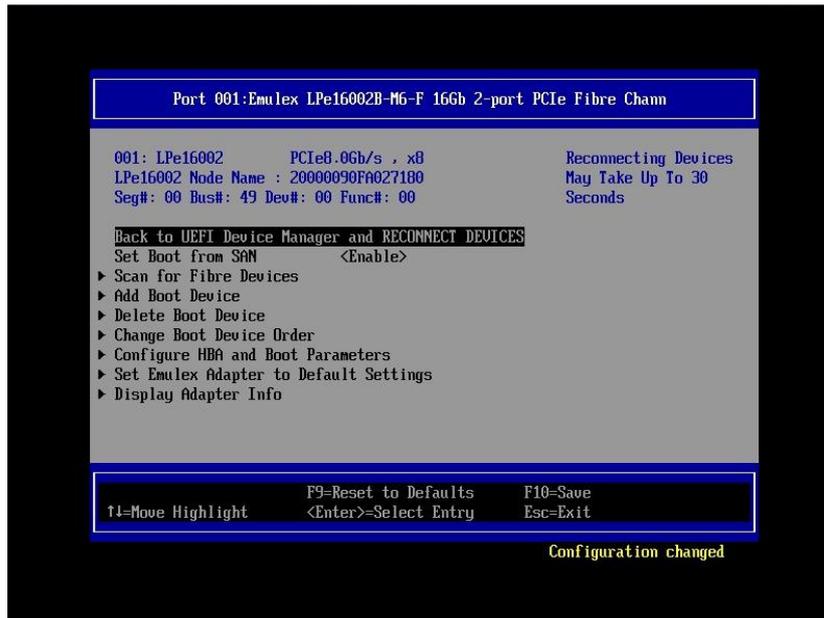
FIGURE 3.19 Topology / Link Speed change confirmation (2)

Remarks

After changing the [Topology Selection] or [Force Link Speed] settings and then selecting [Discard Changes], if you are returned to the screen for changing settings, the changes to the 16Gbps FC Card settings have been discarded. However, you may still see the changed settings displayed by the utility.

If so, select the 16Gbps FC Card again from the menu as described in 3.1.3 Starting the HBA Setup Utility and Selecting an HBA, before proceeding with the work.

Changing the setting of the opposing device

The setting of the opposing Fibre Channel switch and SAN storage unit disk array must also be made static so that it corresponds to the static setting of the 16Gbps FC Card.

For details on the settings required on the ETERNUS when connecting to it, see the ETERNUS manuals at the following website:

http://www.fujitsu.com/global/support/products/computing/storage/disk/manuals/

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3.1.8 Boot device setting

1. Select [Scan for Fibre Devices] from the [Port 001:Emulex LPe16002B-M6-F 16Gb 2-port PCIe Fibre Chann] screen, and then press the [Enter] key.

FIGURE 3.20 Boot device setting (1)

2. Fibre Device information appears when the search process has been successful.
Press the [ESC] key or select [Go to Configuration Main Menu] to return the previous page, and then press the [Enter] key.

FIGURE 3.21 Boot device setting (2)

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Remarks

If the expected Fibre Device is not displayed, there is a possibility that the setting of the SAN storage or the setting or physical connection of the FC switch is incorrect.

Confirm these settings once again.

3. The [Port 001:Emulex LPe16002B-M6-F 16Gb 2-port PCIe Fibre Chann] screen appears. Select [Add Boot Device], and then press the [Enter] key.
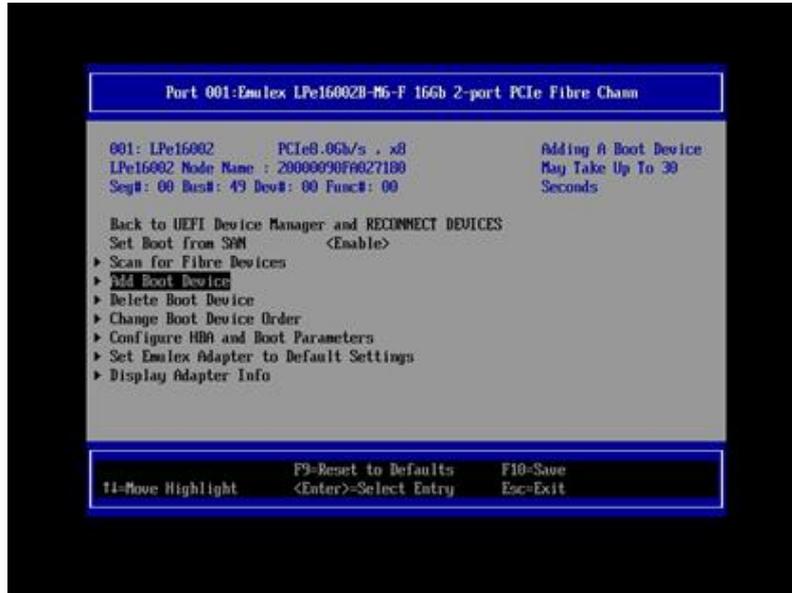
FIGURE 3.22 Boot device setting (3)

4. The [SAN Discovery Target List] screen displays the targets found in the search by [Scan for Fibre Devices]. Select the Fibre Device specifying the boot device, and then press the [Enter] key.

FIGURE 3.23 Boot device setting (4)

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5. The LUN connected to the selected target is displayed. Select the LUN from which the system is to be started. Then, press the [Enter] key. A confirmation screen appears.

FIGURE 3.24 Boot device setting (5)

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6. Select [Commit Changes], and then press the [Enter] key.

FIGURE 3.25 Boot device setting (6)

7. Select [Return to Previous Page], and then press the [Enter] key to return to the higher menu.
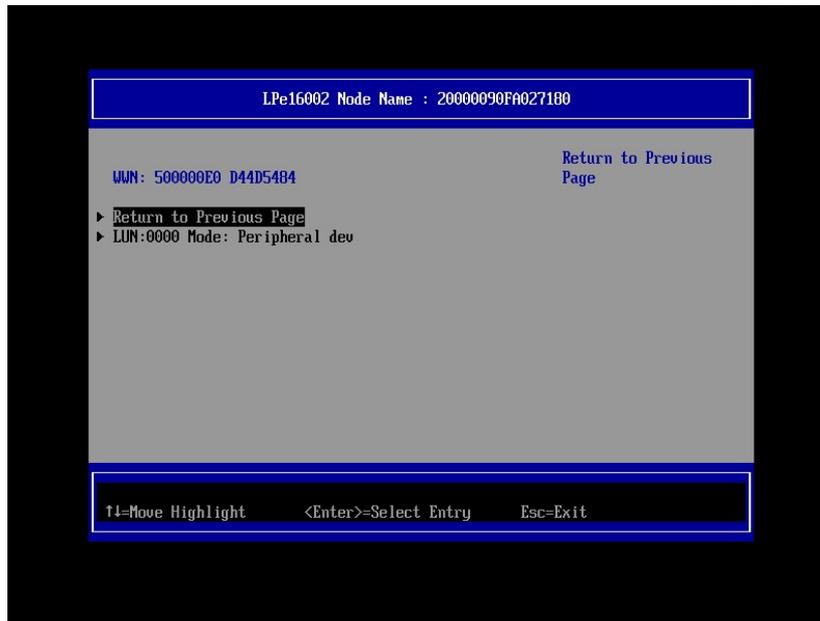
FIGURE 3.26 Boot device setting (7)

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8. Select [Go to Configuration Main Menu], and then press the [Enter] key to return to the higher menu.

FIGURE 3.27 Boot device setting (8)

9. To register the dump device of sadump, procedure 3 is repeated. Please advance to step 10 when you do not register the dump device.

10. Select [Delete Boot Device] from the [Emulex Adapter Configuration Main Menu] screen, and then press the [Enter] key. (Here, confirm only the registration status of the boot device that was set with [Commit Changes].)
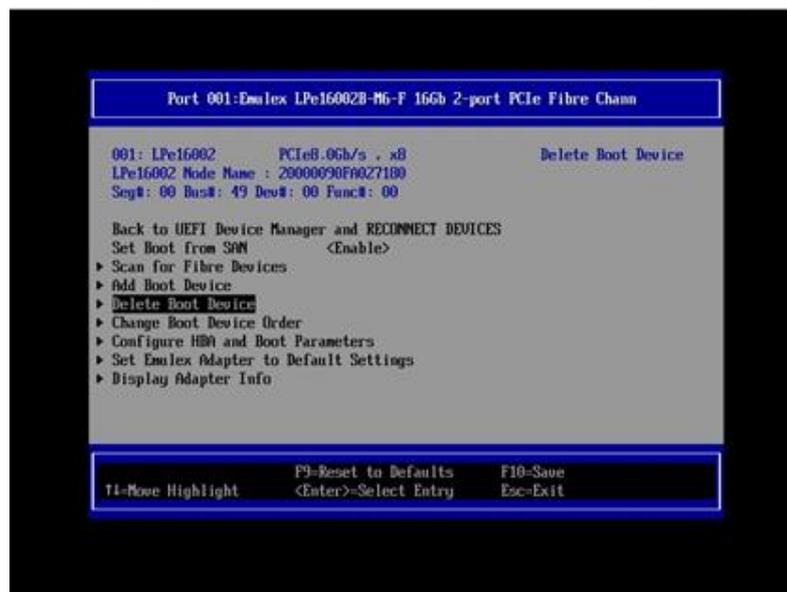
FIGURE 3.28 Boot device setting (9)

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11. Confirm the registration of the boot device that was set with [Commit Changes].

In the following example, LUN 0000 is confirmed connected with the target WWW: 500000E0D44D5484.

FIGURE 3.29 Boot device setting (10)

12. Select [Discard Changes], and then press the [Enter] key to return to the higher menu.
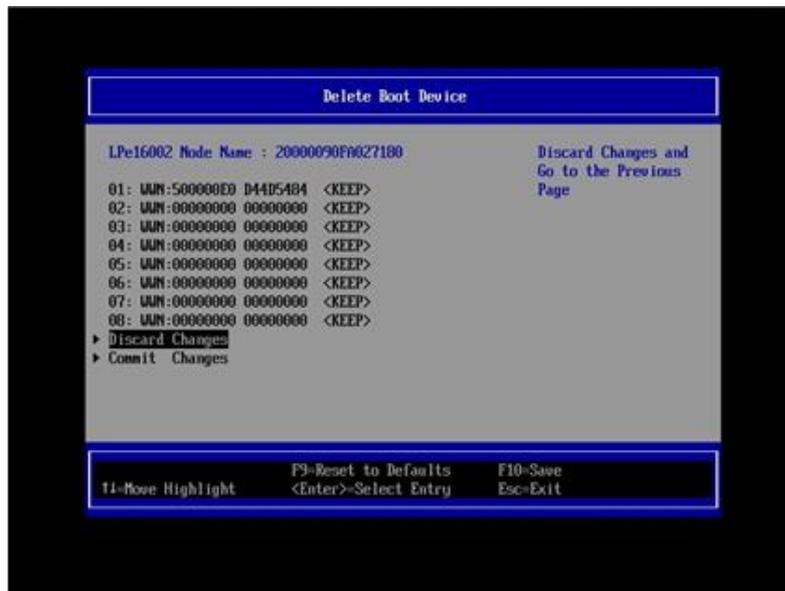
FIGURE 3.30 Boot device setting (11)

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13. Select [Back to Display Adapters and RECONNECT DEVICES], and then press the [Enter] key to return to the higher menu.
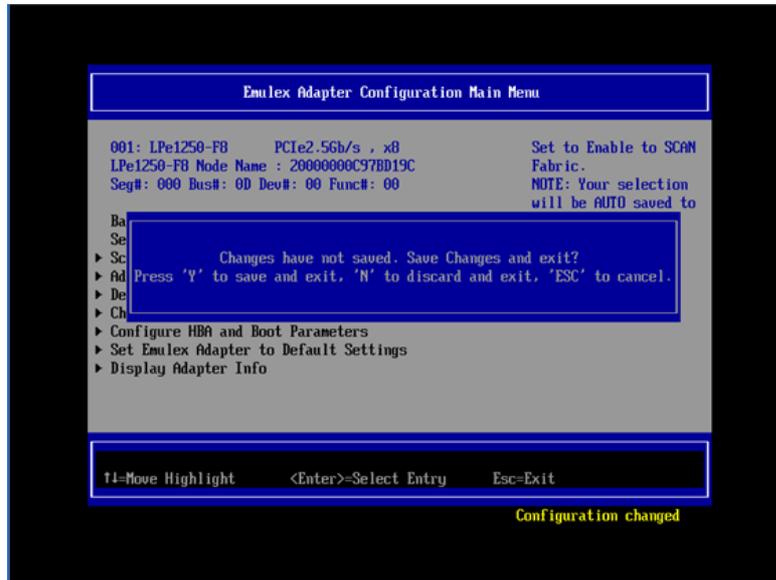
FIGURE 3.31 Boot device setting (12)

Important) Do not select [Back to Display Adapters and RECONNECT DEVICES] to return to the higher menu, If select, your system will hung up. If your system hung up and is not operated for three minutes and over, reset the system and restart setting procedures.
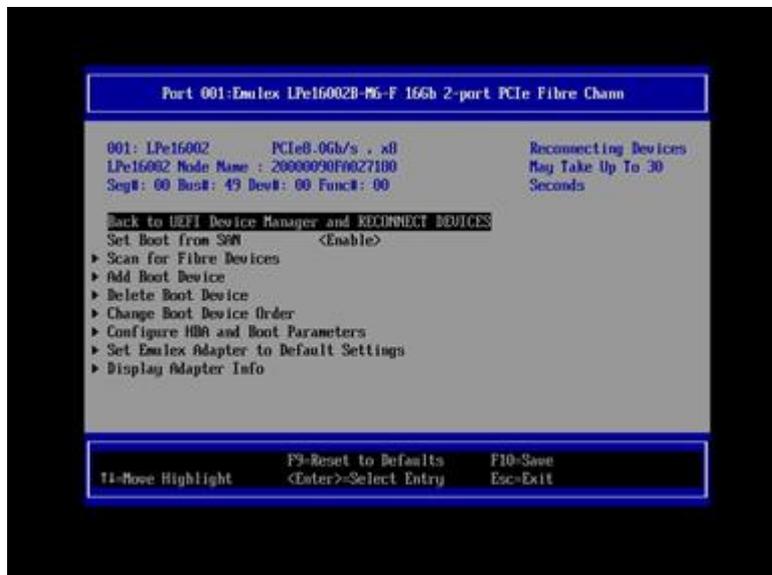
FIGURE 3.32 Boot device setting (13)

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14. For a multipath configuration, make the settings described in the sections from 3.1.3 Starting the HBA setup utility to 3.1.7 Speed and Topology settings for all the HBAs connected to the SAN storage unit LUN from which the system is started. Also, after installing the operating system and multipath driver, perform the operation described in 3.1.8 Boot device setting for all the HBAs used to start the system.

After finishing all the settings, select [Exit Emulex HBA Configuration Utility], and then press the [Enter] key to return to the Device Manager menu.

Note

If following message appears following the operations below, press the [N] key or [ESC] key.

> Changes have not saved. Save Changes and exit?
>
> Press 'Y' save and exit, 'N' to discard and exit, 'ESC' to cancel.

You need not perform another operation here because the [Commit Changes] or [Discard Changes] operation from the menu completes the task of changing or discarding settings.

Select the relevant item from the [Delete Boot Device] or [Change Boot Device Order] menu.

↓

Select [Commit Changes] or [Discard Changes].

↓

Go back to the [Delete Boot Device] or [Change Boot Device Order] menu.

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3.1.9 Applying settings

Restart the system to apply the changes in the settings.

To restart the system, use the following procedure, or select [Reset] from the [Power Control] window of the MMB Web-UI.

1. Press the [Esc] key to go to the Boot Manager Front Page.

FIGURE 3.33 Restarting the system (1)

2. Select [Boot Maintenance Manager], and then press the [Enter] key to go to the [Boot Maintenance Manager] screen.

FIGURE 3.34 Restarting the system (2)

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3. Select [Reset System], and then press the [Enter] key. The system is restarted.
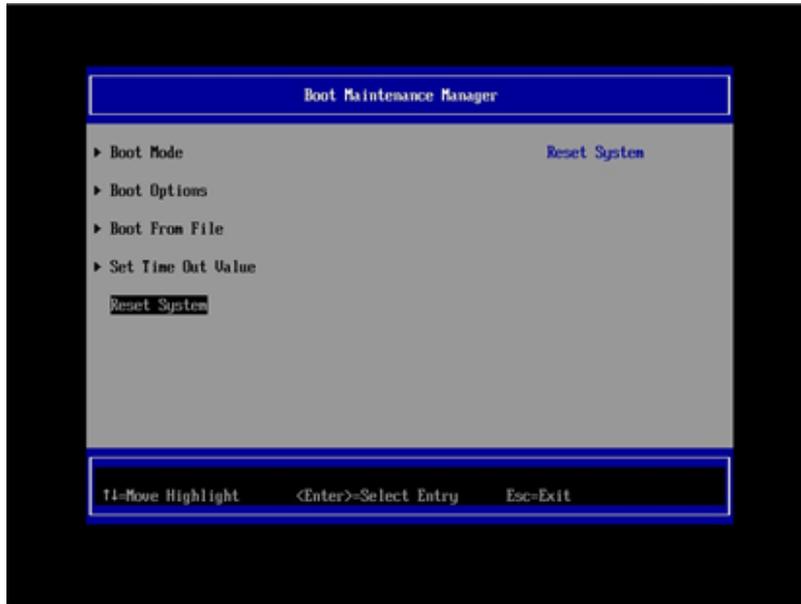
FIGURE 3.32 Restarting the system (3)

4. Please push either of key (space key) while the FUJITSU logo is displayed. 'Enter' is excluded.

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3.1.10 Recording the WWN of the FC port

According to the design drawing of the SAN boot environment, write down the WWN (World Wide Name), specific address information assigned to the FC port of the 16Gbps FC Card of each server.

FIGURE 3.36 [Adapter Selection] menu

Remarks

If you are updating 16Gbps FC Card firmware (e.g., Boot BIOS), check the WWN after the firmware update.

To clearly identify the mounting location of the 16Gbps FC Card, record the host name (the one that identifies the PRIMEQUEST 2000 series server), mounted card, mounting slot location, BUS number, and DEV number. For the BUS number and slot number, check the BUS number and slot number of the target HBA from the [IOU] menu and [PCI_Box] menu of the MMB Web-UI.

The BUS number appears as the middle number of the three numbers delimited by slash in the [Seg/Bus/Dev] item.
The following example shows how the WWNs are recorded.

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TABLE 2.1 WWN recording example

Host name (to identify a server)	Mounted card (type)	PCI	FC port
		BUS-DEV	WWN
Server #1	MC-0JFC21	0x - 00	10 00 00 00 C9 **
		0x - 00	10 00 00 00 C9 **
Server #2	MC-0JFC21	0x - 00	10 00 00 00 C9 **
		0x - 00	10 00 00 00 C9 **
:	:	:	:
:	:	:	:

Notes

- Always keep the WWN information up to date, and share and manage it together with the SAN boot system administrator and maintenance personnel.
- If the WWN information is wrong, connection to the SAN storage is disabled and problems such as being unable to start the operating system occur.
- When a 16Gbps FC Card is moved or hardware is replaced for maintenance purposes, the WWN may be changed.

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3.2   Procedure for Setting Legacy BIOS Driver Version 6.02x6 or Later on the 16Gbps FC Card

This section describes the procedure for setting Legacy BIOS driver version 6.02x6 or later.

Confirm the setting to boot by using Legacy BIOS mode by referring to the procedures in 2.2.1 and 2.2.2.

3.2.1   Starting the HBA Setup Utility

1.   Press [Alt]+ [E] or [Ctrl]+ [E] key during the following massage appears.

```
Emulex LightPulse FC x86 BIOS, Version 6.02x6
Copyright (c) 1997-2013 Emulex. All rights reserved.

Press <Alt E> or <Ctrl E> to enter Emulex BIOS configuration
utility. Press <s> to skip Emulex BIOS
Emulex BIOS is Disabled on Adapter   01

Installing Emulex BIOS ......
Bringing the Link up, Please wait...
_
```

FIGURE 3.37 Starting Legacy BIOS HBA Setup

2.   Start LightPluse BIOS Utility.

FC ports of Fibre Channel Card appear in HBA Listing screen. Select a FC port to set up and press [Enter] key.

```
        Emulex LightPulse FC BIOS Utility, KA 6.02x6

        This utility displays and saves changes when selected.
     You will be prompted to reboot for all changes to take effect.

              Emulex FC Ports in the System:

    1. LPe16002-M6:     Bus:05 Dev:00 Func:01   WWPN: 10000090FA020A77
    2. LPe16002-M6:     Bus:05 Dev:00 Func:00   WWPN: 10000090FA020A76




            Enter <Esc> to exit  <PageDn> to Next Page
              <↑/↓> to Highlight, <Enter> to Select

        Copyright (c) 1997-2013 Emulex. All rights reserved.
```

FIGURE 3.38 Emulex LightPlus BIOS Utility Screen (1)

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3. Menu for the FC port selected in the previous screen appears. Memory Address (Mem Base), Firmware Version, WWPN (Port Name), WWNN (Node Name), and Topology for the FC port also appear.

```
          Emulex LightPulse FC BIOS Utility, KA 6.02x6

02:  LPe16002-M6:                    Bus#: 05 Dev#: 00 Func#: 00
Mem Base:  FA018000  Firmware Version:  1.1.43.202     BIOS: Enabled
Port Name:  10000090FA020A76           Node Name:  20000090FA020A76
                                       Link Status:  Link Down




                    Enable/Disable Boot from SAN
                    Scan for Target Devices
                    Reset Adapter Defaults
                    Configure Boot Devices
                    Configure Advanced Adapter Parameters



                    Enter <Esc> to Previous Menu
                    <↑/↓> to Highlight, <Enter> to Select

          Copyright (c) 1997-2013 Emulex. All rights reserved.
```

FIGURE 3.39 Emulex LightPlus BIOS Utility Screen (2)

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3.2.2   Enabling BIOS

Enable the HBA BIOS so that the HBA can recognize the LUNs of the SAN storage unit and to enable the system to be started from one of them.

1.   Select [Enable/Disable Boot from SAN], and then press the [Enter] key.

```
        Emulex LightPulse FC BIOS Utility, KA 6.02x6

02:  LPe16002-M6:                    Bus#: 05 Dev#: 00 Func#: 00
Mem Base:  FA018000  Firmware Version:  1.1.43.202    BIOS: Disabled
Port Name:  10000090FA020A76         Node Name:  20000090FA020A76
                                     Link Status:  Link Down




              Enable/Disable Boot from SAN
              Scan for Target Devices
              Reset Adapter Defaults
              Configure Boot Devices
              Configure Advanced Adapter Parameters



              Enter <Esc> to Previous Menu
              <↑/↓> to Highlight, <Enter> to Select

        Copyright (c) 1997-2013 Emulex. All rights reserved.
```

FIGURE 3.40 Enable/Disable Boot form SAN Setup Screen (1)

2.   Set [Boot BIOS] is "Enabled," and then press the [Enter] key.

```
        Emulex LightPulse FC BIOS Utility, KA 6.02x6

02:  LPe16002-M6:                    Bus#: 05 Dev#: 00 Func#: 00
Mem Base:  FA018000  Firmware Version:  1.1.43.202    BIOS: Enabled
Port Name:  10000090FA020A76         Node Name:  20000090FA020A76
                                     Link Status:  Link Down



              Boot BIOS is: Enabled
                     Enable
                     Disable






              Enter <Esc> to Previous Menu
              <↑/↓> to Highlight, <Enter> to Select

        Copyright (c) 1997-2013 Emulex. All rights reserved.
```
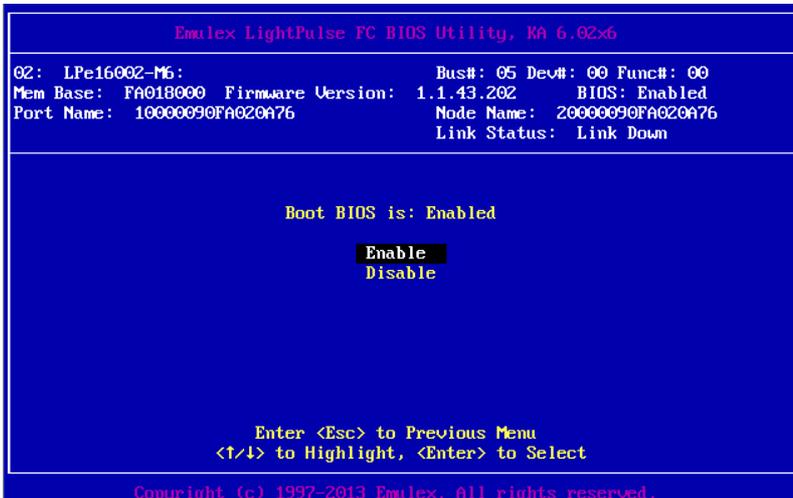
FIGURE 3.41 Enable/Disable Boot form SAN Setup Screen (2)

Note

Confirm that [Boot BIOS] is "Enabled."

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3.2.3 Link Speed and Topology Settings

The following describes how to make the Speed and Topology settings.

■Topology Setting

1. Select [Configure Advance Adapter Parameters] form the Main menu, and then press the [Enter] key.
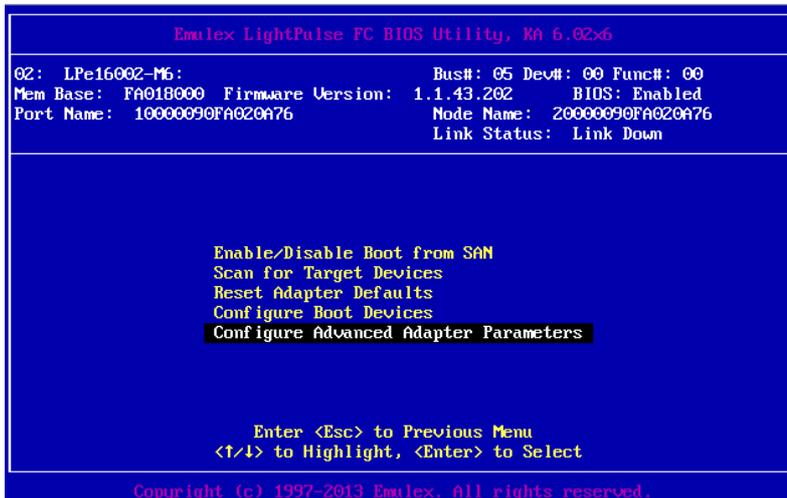
FIGURE 3.42 Topology Selection Setting (1)

2. Select [Topology Selection], and then press the [Enter] key.
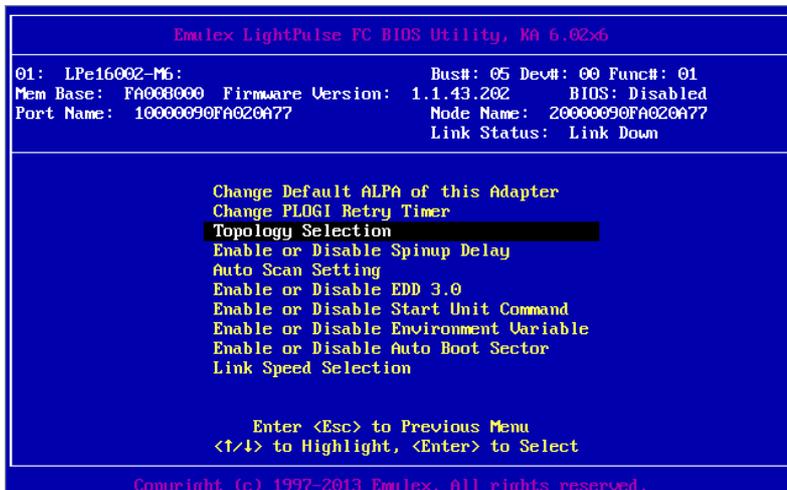
FIGURE 3.43 Topology Selection Setting (2)

3. When you connect 16Gbps FC Card to the storage supporting 16 Gbps, you have to connect via FC switch. Note that conventional FCAL connection is not supported in above case. Confirm SAN connection configuration and select the appropriate setting, and then press the [Enter] key. Change the setting from [Auto Topology: Loop first] (Default) by referring to the connection setting in the following screen.

    Fabric Connection: Fabric Point to Point

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FIGURE 3.44 Fabric Point to Point Setting Screen

■Link Speed setting

Note

Make the following setting that corresponds to the connection kink speed (2 Gbps/ 4 Gbps/ 8 Gbps).

Do not set [Auto select (Default)].

1.   Select [Configure Advance Adapter Parameters] from the Main menu and press the [Enter] key.
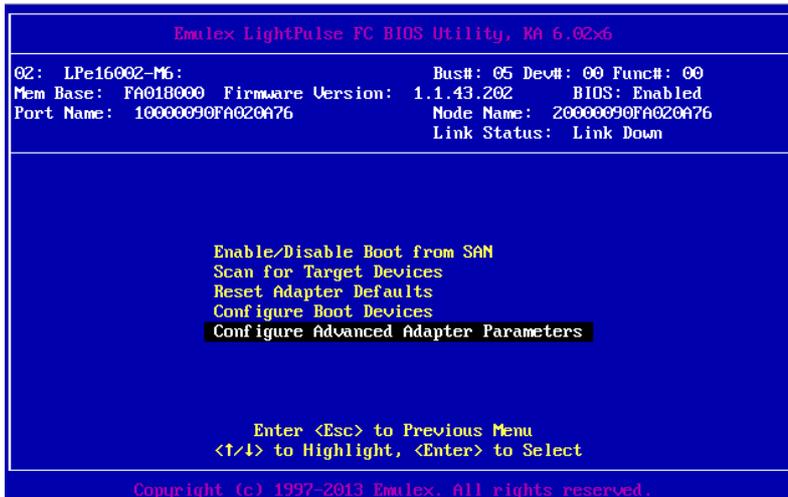
FIGURE 3.45 Configure Advanced Adapter Parameters Setting Screen

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2. Select [Link Speed Selection] in the following screen, and then press [Enter] key.
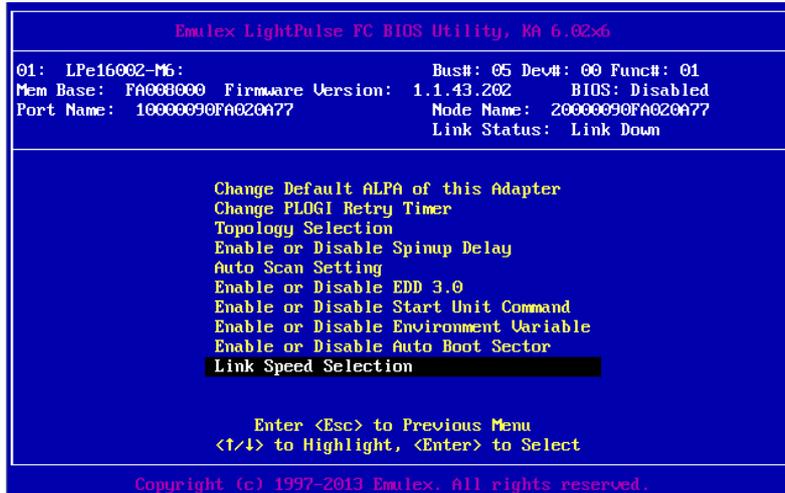
FIGURE 3.46 Link Speed Selection Setting Screen

3. Select the link speed corresponding to the connection environment (connected FC switch or SAN storage unit), and then press the [Enter] key.

FIGURE 3.47 Link Speed Setting Screen

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4. Press the [ESC] key three times to return LightPlus BIOS Utility.
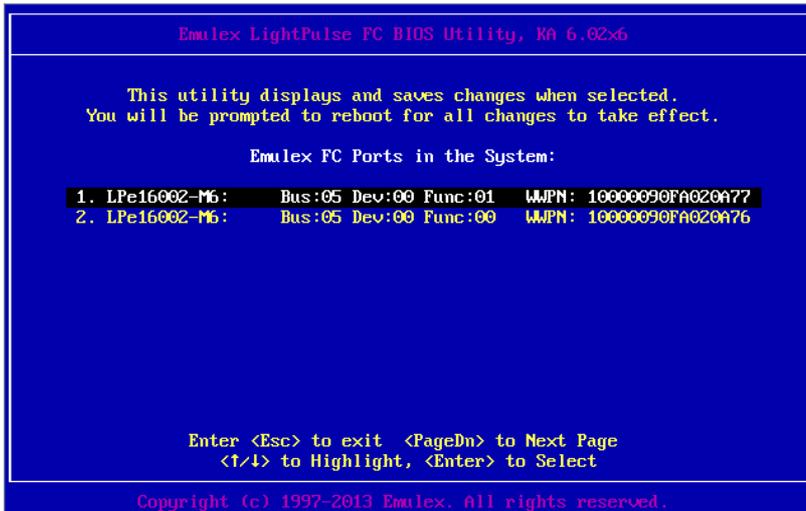
FIGURE 3.48 Emulex LightPluse BIOS Utility Screen

5. Press the [ESC] key again. Press [Y] to reboot the system and save changes.
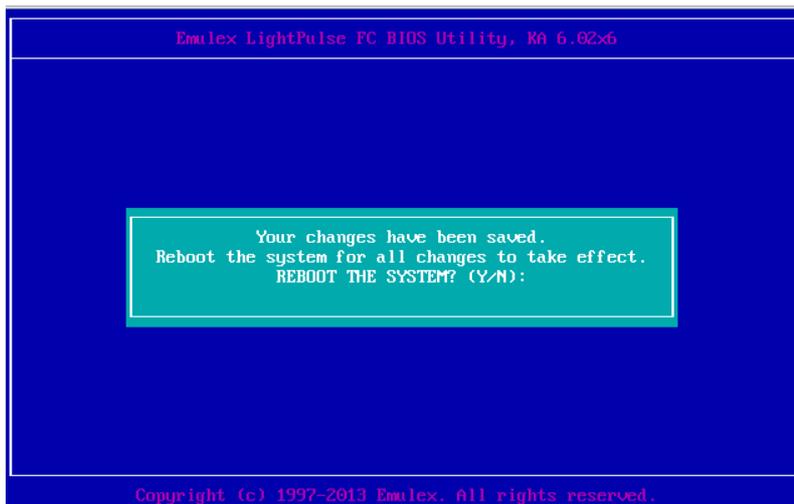
FIGURE 3.49 Saving Emulex LightPluse BIOS Settings

Changing the setting of the opposing device

The setting of the opposing Fibre Channel switch and SAN storage unit disk array must also be made static so that it corresponds to the static setting of the 16Gbps FC Card.

For details on the settings required on the ETERNUS when connecting to it, see the ETERNUS manuals at the following website:

http://www.fujitsu.com/global/support/products/computing/storage/disk/manuals/

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3.2.4 Boot device setting

The device that boot from SAN setting. Please do not set two or more devices.

1. Select connect boot device from the FC port, and then press the [Enter] key.

```
        Emulex LightPulse FC BIOS Utility, KA 6.02x6

        This utility displays and saves changes when selected.
      You will be prompted to reboot for all changes to take effect.

              Emulex FC Ports in the System:

    1. LPe16002:        Bus:8C Dev:00 Func:00   WWPN: 10000090FA0270C8
    2. LPe16002:        Bus:8C Dev:00 Func:01   WWPN: 10000090FA0270C9




        Enter <Esc> to exit  <PageDn> to Next Page
          <↑/↓> to Highlight, <Enter> to Select
      Copyright (c) 1997-2013 Emulex. All rights reserved.
```

FIGURE 3.50 Boot device setting (1)

2. Select [Configure Boot Devices] form the Main menu, and then press the [Enter] key.

```
        Emulex LightPulse FC BIOS Utility, KA 6.02x6
01:  LPe16002:                  Bus#: 8C Dev#: 00 Func#: 00
Mem Base:  90010000  Firmware Version:  1.1.43.202    BIOS: Enabled
Port Name:  10000090FA0270C8          Node Name:  20000090FA0270C8
                                      Link Status:  Link UP



              Enable/Disable Boot from SAN
              Scan for Target Devices
              Reset Adapter Defaults
              Configure Boot Devices
              Configure Advanced Adapter Parameters



            Enter <Esc> to Previous Menu
          <↑/↓> to Highlight, <Enter> to Select
      Copyright (c) 1997-2013 Emulex. All rights reserved.
```

FIGURE 3.51 Boot device setting (2)

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3. Select [Primary Boot], and then press the [Enter] key.

```
          Emulex LightPulse FC BIOS Utility, KA 6.02x6

01:  LPe16002:                         Bus#: 8C Dev#: 00 Func#: 00
Mem Base:  90010000  Firmware Version:  1.1.43.202     BIOS: Enabled
Port Name:  10000090FA0270C8           Node Name:  20000090FA0270C8
                                       Link Status:  Link UP


             List of Saved Boot Devices:

     1. Unused   DID:000000 WWPN:00000000 00000000 LUN:00   Primary Boot
     2. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
     3. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
     4. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
     5. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
     6. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
     7. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
     8. Unused   DID:000000 WWPN:00000000 00000000 LUN:00



          <↑/↓> to Highlight, <Enter> to Select

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```

FIGURE 3.52 Boot device setting (3)

4. Select the Boot device (FUJITSU ETERNUS_DXL), and then press the [Enter] key.

```
          Emulex LightPulse FC BIOS Utility, KA 6.02x6

01:  LPe16002:                         Bus#: 8C Dev#: 00 Func#: 00
Mem Base:  90010000  Firmware Version:  1.1.43.202     BIOS: Enabled
Port Name:  10000090FA0270C8           Node Name:  20000090FA0270C8
                                       Link Status:  Link UP




  00. Clear selected boot entry!!                                      00
  01. DID:010400 WWPN:500000E0 D44D5490 LUN:00     FUJITSU ETERNUS_DXL  0000






          Enter <ESC> to Exit    <PageDn> to NextPage
              <↑/↓> to Highlight, <Enter> to Select

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```

FIGURE 3.53 Boot device setting (4)

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5.	Device information is displayed, and then press the [Enter] key.
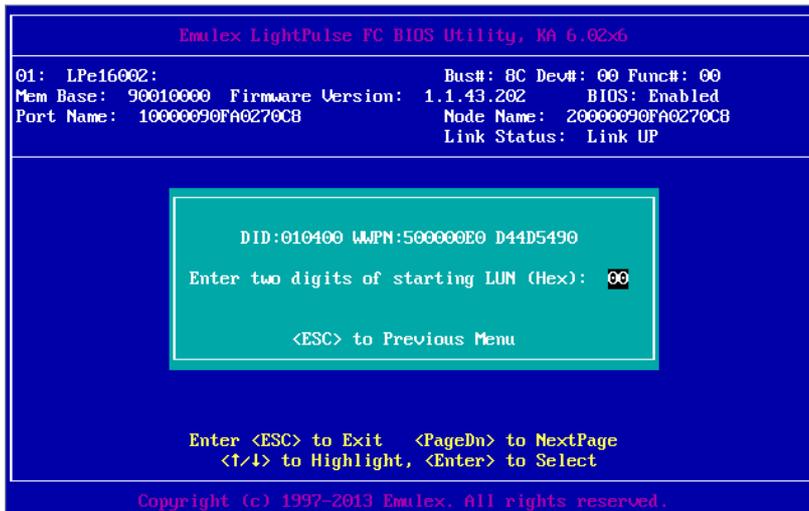
FIGURE 3.54 Boot device setting (5)

6.	Select the device that registers.

FIGURE 3.55 Boot device setting (6)

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7.   Select [Boot this device via WWPN], and then press the [Enter] key.

```
          Emulex LightPulse FC BIOS Utility, KA 6.02x6

01:  LPe16002:                        Bus#: 8C Dev#: 00 Func#: 00
Mem Base:  90010000  Firmware Version:  1.1.43.202     BIOS: Enabled
Port Name:  10000090FA0270C8          Node Name:  20000090FA0270C8
                                       Link Status:  Link UP


        DID:010400 WWPN:500000E0 D44D5490 LUN:00

        Boot this device via WWPN
        Boot this device via DID


              <ESC> to Previous Menu
          <↑/↓> to Highlight, <Enter> to Select



       Enter <ESC> to Exit   <PageDn> to NextPage
           <↑/↓> to Highlight, <Enter> to Select

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```

FIGURE 3.56 Boot device setting (7)

8.   The boot device is added.

```
          Emulex LightPulse FC BIOS Utility, KA 6.02x6

01:  LPe16002:                        Bus#: 8C Dev#: 00 Func#: 00
Mem Base:  90010000  Firmware Version:  1.1.43.202     BIOS: Enabled
Port Name:  10000090FA0270C8          Node Name:  20000090FA0270C8
                                       Link Status:  Link UP


            List of Saved Boot Devices:

      1. Used     DID:000000 WWPN:500000E0 D44D5490 LUN:00  Primary Boot
      2. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
      3. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
      4. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
      5. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
      6. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
      7. Unused   DID:000000 WWPN:00000000 00000000 LUN:00
      8. Unused   DID:000000 WWPN:00000000 00000000 LUN:00



          <↑/↓> to Highlight, <Enter> to Select

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```

FIGURE 3.57 Boot device setting (8)

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9. Press the [Enter] key, then Select [Scan for Target Devices] form the Main menu, and then press the [Enter] key.

```
Emulex LightPulse FC BIOS Utility, KA 6.02x6

01: LPe16002:                        Bus#: 8C Dev#: 00 Func#: 00
Mem Base:  90010000  Firmware Version: 1.1.43.202     BIOS: Enabled
Port Name:  10000090FA0270C8          Node Name:  20000090FA0270C8
                                      Link Status:  Link UP




              Enable/Disable Boot from SAN
              Scan for Target Devices
              Reset Adapter Defaults
              Configure Boot Devices
              Configure Advanced Adapter Parameters



              Enter <Esc> to Previous Menu
           <↑/↓> to Highlight, <Enter> to Select

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```
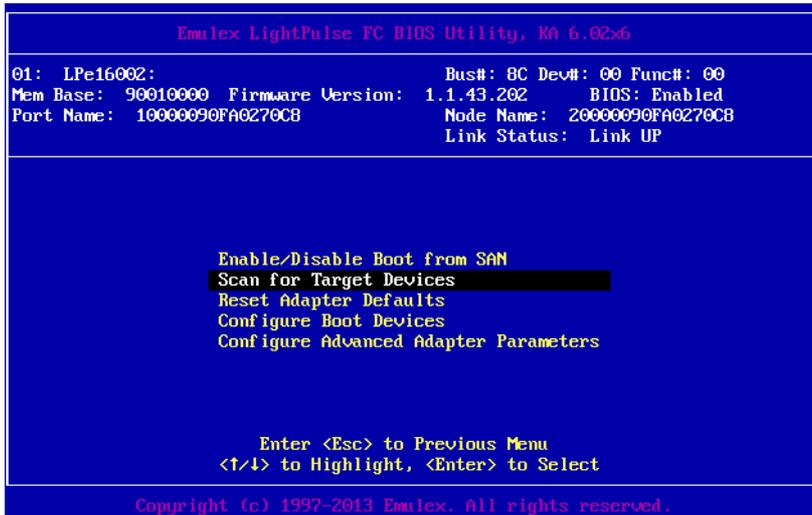
FIGURE 3.58 Boot device setting (9)

10. The search result of the boot device is displayed.

```
Emulex LightPulse FC BIOS Utility, KA 6.02x6

01: LPe16002:                        Bus#: 8C Dev#: 00 Func#: 00
Mem Base:  90010000  Firmware Version: 1.1.43.202     BIOS: Enabled
Port Name:  10000090FA0270C8          Node Name:  20000090FA0270C8
                                      Link Status:  Link UP

          Devices Present on This Adapter:

  01. DID:010400 WWPN:500000E0 D44D5490 LUN:00    FUJITSU ETERNUS_DXL    0000








              Enter <Esc> to Previous Menu

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```
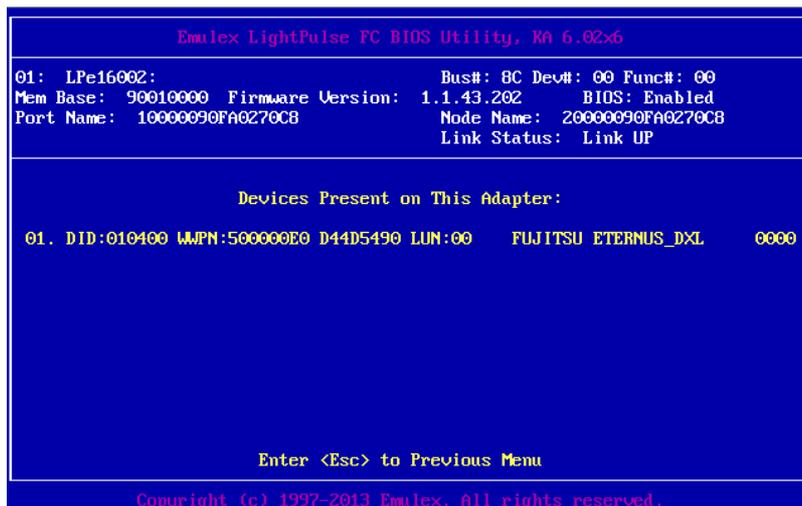
FIGURE 3.59 Boot device setting (10)

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11. Press the [ESC] key, then returns to the Main menu.
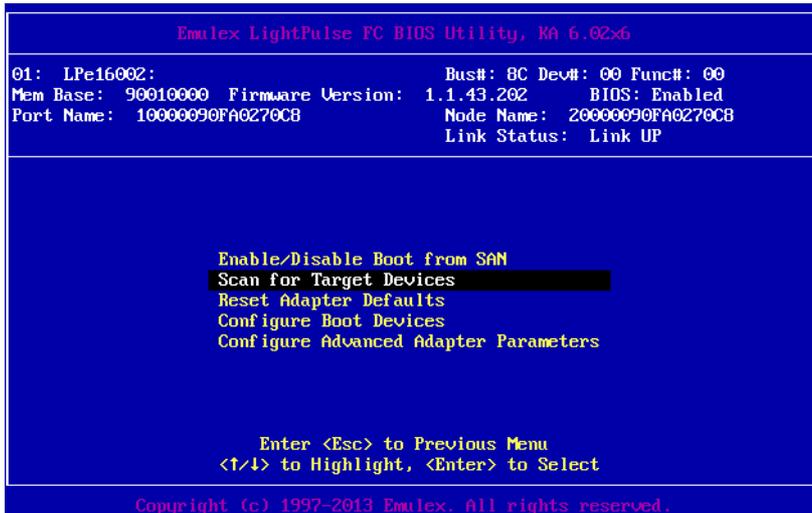
FIGURE 3.60 Boot device setting (11)

Remarks

If the expected Fibre Device is not displayed, there is a possibility that the setting of the SAN storage or the setting or physical connection of the FC switch is incorrect.

Confirm these settings once again.

12. Press the [ESC] key, then message to save the setting is displayed. then, returns to the [Device Manager].

13. For a multipath configuration, make the settings described in the sections from 3.2.1 Starting the HBA setup utility to 3.2.3 Speed and Topology settings for all the HBAs connected to the SAN storage unit LUN from which the system is started. Also, after installing the operating system and multipath driver, perform the operation described in 3.2.4 Boot device setting for all the HBAs used to start the system.

After finishing all the settings, select [Exit Emulex HBA Configuration Utility], and then press the [Enter] key to return to the Device Manager menu.

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CHAPTER 4 Consideration of Windows Installation

This section describes how to install Windows in the FC SAN boot environment.

4.1   Windows Server OS install

Refer to OS installation manual for the installation of Windows Server OS.

4.1.1   Preparing for Windows Server OS installation

Make settings for installation in advance.

For details on this advance setup, see 4.4.1 Advance setup in the *PRIMEQUEST 2000 Series Installation Manual* (C92344-0536).

For a multipath configuration, disconnect the secondary cable connected to the server.

Specifically, use a single path configuration (connection with only one FC cable) until you complete the installation of the operating system and multipath driver.

If the server is in a multipath connection state, the operating system cannot be installed correctly. Manually disconnect the secondary FC path beforehand (more specifically, disconnect the secondary cable of each server).

4.1.2　Installing the OS and bundled software

The boot order can be changed according to the following procedure.

1.　After powering on the partition, press any key ([Space] key, for example) other than the [Enter] key while the FUJITSU logo is displayed, to display the Boot Manager Front Page.

2.　Select the following items from the menu in the following order, on the Boot Manager Front Page:
[Boot Maintenance Manager] - [Boot Options] - [Change Boot Order] - [Change the order]

3.　Specify it as follows for the highest-priority device to boot from remote storage.
　　Case installed in UEFI BIOS mode : UEFI: Fujitsu Virtual CDROM0 1.00
　　Case installed in Legacy BIOS mode : Fujitsu Virtual CDROM0 1.00

```
                          Change Boot Order

  Change the order       <Fujitsu Virtual CDROM0    Change the order
                         1.00>
                         <(Bus 02 Dev 00)PCI RAID
                         Adapter>
                         <Windows Boot Manager>
                         <RHEL6.4>
                         <EFI Internal Shell>
                         <EFI: Fujitsu Virtual
                         CDROM0 1.00>
                         <EFI: Fujitsu Virtual
                         CDROM1 1.00>
                         <EFI USB Device 2>
                         <EFI USB Device 3>
                         <EFI USB Device 4>
                         <EFI USB Device 5>
                                                         ↓

  ↑↓=Move Highlight      <Enter>=Select Entry     Esc=Exit
```
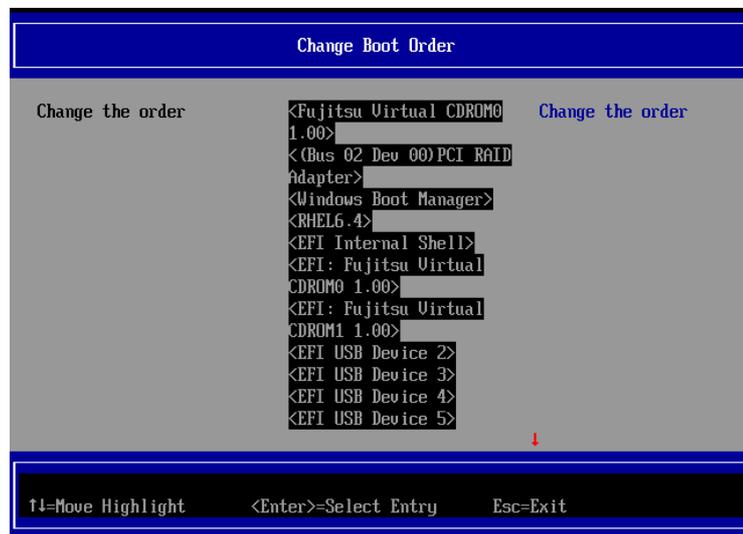
FIGURE 4.1 [Change Boot Order] menu　PRIMEQUEST 2000

4.　Specify [Commit Changes and Exit] - [Reset System] to reboot the partition.

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4.1.3 Various post-installation settings

Make various settings by referring to CHAPTER 5 Work after Operating System Installation (PRIMEQUEST 2000) or CHAPTER 6 Work after Operating System Installation (PRIMEQUEST 2000) in the *PRIMEQUEST 2000 Series Installation Manual* (C92344-0536).

4.1.4 Install OCManager

1. Install OCManager.
2. The installation of OCManager can be confirmed by the existence of [Emulex] - [OCManager], which is displayed by selecting [Programs] from the [Start] menu.
3. Refer to install procedure of OEM Driver Installation about how to install OCManager

   Remarks
   At this time, leave the secondary FC path cable disconnected.

4.1.5 Install multi-path driver

The multi-pass driver that uses it is installed.
Refer to the manual of the multi-pass driver that uses it for the installation procedure.

4.1.6 Restore the multi-pats connection

Restore the multipath connection.
OS is shutdown, the cable of the FC passing cut according to procedure 1 is reconnected after the power supply of the partition is cut, and OS is started. After it shuts down after the start by the multi-pass is confirmed, internal HDD into is added when internal HDD into is used.
Then, proceed to 4.2 Changing and Checking the Setting of Detailed FC Card Information.

4.2 Changing and Checking the Setting of Detailed FC Card Information

To increase the stability of connectivity with the ETERNUS series machine, adjust some of the driver parameters after installing the operating system and driver.

4.2.1 Setting driver parameters (for OCManager)

1. Click the [Start] button to select [Programs] or [All programs], and then select [Emulex] - [OCManager].
   OCManager starts.
   The local server and the HBAs under its control are displayed in the left side of the window. Select the local server and then click the [Driver Parameters] tab in the right side of the window.

Note

Driver parameters can be set not for the local server but for each HBA. If driver parameters are set for each HBA, the HBA may be changed due to replacement for maintenance purposes or server switching. In such a case, the driver parameters are set to the default setting values. As a rule, select the local server and then set the driver parameters.

2. Set the following driver parameters.
   - Topology
   - Queue Depth
   - Queue Target
   - Link Speed

For details on the settings required on the ETERNUS when connecting to it, see the ETERNUS manuals at the following website:
http://www.fujitsu.com/global/support/products/computing/storage/disk/manuals/

3. Confirm the settings made so far.
   After finishing all the settings, from the [File] menu, select [Exit] to quit OCManager.
   Then, proceed to 4.3 Checking Registry Information.

4.3 Note concerning connection with storage device

The setting change of the FC card might be necessary according to the connected storage.
Please refer to the manual of the storage device for details.
For details on the settings required on the ETERNUS when connecting to it, see the ETERNUS manuals at the following website:
http://www.fujitsu.com/global/support/products/computing/storage/disk/manuals/

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CHAPTER 5   Consideration of Linux Installation

This chapter describes how to install Red Hat Enterprise Linux on the PRIMEQUEST 2000 series server.

5.1   Linux Server OS Install

Refer to OS installation manual for the installation of Linux OS.

5.1.1   Preparing for Linux installation

Make settings for installation in advance.

For details on this advance setup, see 4.4.1 Advance setup in the *PRIMEQUEST 2000 Series Installation Manual* (C92344-0536).

For a multipath configuration, disconnect the secondary cable connected to the server.

Specifically, use a single path configuration (connection with only one FC cable) until you complete the installation of the operating

system and multipath driver.

If the server is in a multipath connection state, the operating system cannot be installed correctly. Manually disconnect the secondary FC

path beforehand (more specifically, disconnect the secondary cable of each server).

5.1.2   Installing the OS and bundled software

Remarks

If the operating system supports UEFI mode, you can install it in UEFI mode by using the following procedure to change the boot order.

1.   After powering on the partition, press any key ([Space] key, for example) other than the [Enter] key while the FUJITSU logo is displayed, to display the Boot Manager Front Page.

2.   Select the following items from the menu in the following order, on the Boot Manager Front Page:

   [Boot Maintenance Manager] - [Boot Options] - [Change Boot Order] - [Change the order]

3.   Specify it as follows for the highest-priority device to boot from remote storage.

   Case installed in UEFI BIOS mode : UEFI: Fujitsu Virtual CDROM0 1.00

   Case installed in Legacy BIOS mode : Fujitsu Virtual CDROM0 1.00

```
                          Change Boot Order

   Change the order         <Fujitsu Virtual CDROM0      Change the order
                            1.00>
                            <(Bus 02 Dev 00)PCI RAID
                            Adapter>
                            <Windows Boot Manager>
                            <RHEL6.4>
                            <EFI Internal Shell>
                            <EFI: Fujitsu Virtual
                            CDROM0 1.00>
                            <EFI: Fujitsu Virtual
                            CDROM1 1.00>
                            <EFI USB Device 2>
                            <EFI USB Device 3>
                            <EFI USB Device 4>
                            <EFI USB Device 5>
                                                          ↓

   ↑↓=Move Highlight       <Enter>=Select Entry     Esc=Exit
```
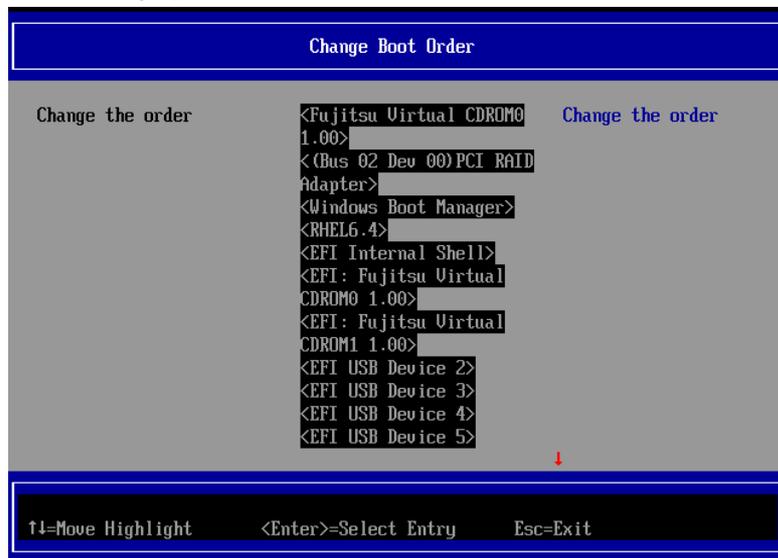
FIGURE 5.1 [Change Boot Order] menu   PRIMEQUEST 2000

4.   Specify [Commit Changes and Exit] - [Reset System] to reboot the partition.

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5.1.3 Advanced settings of driver parameters

Make various settings by referring to CHAPTER 5 Work after Operating System Installation (PRIMEQUEST 2000) or CHAPTER 6
Work after Operating System Installation (PRIMEQUEST 2000) in the *PRIMEQUEST 2000 Series Installation Manual* (C92344-0536).

5.1.4 Install OCManager

1. Install OCManager.
2. If you install OCManager, you will need lib pakeage. Install libnl pakeage.
    Get FC card driver/Utility and install "OCManager". OCManager includes Libnl pakeage.
3. Copy the binary files on the PRIMEQUEST 2000 series optional directory
4. Refer to install procedure of OEM Driver Installation about how to install OCManager
5.

    Remarks

    One side FC cable is still take off the connector at this point.

5.1.5 Install multi-path driver

Install Multi-path driver the multi-pass driver that uses it is installed.
Refer to the manual of the multi-pass driver that uses it for the installation procedure.

5.1.6 Restore the multi-path connection

Recover multi-pass connection.
OS is shutdown, the cable of the FC passing cut according to procedure 1 is reconnected after the power supply of the partition is cut, and OS is started. After it shuts down after the start by the multi-pass is confirmed, internal HDD into is added when internal HDD into is used.

Remarks

Confirm multi-pass status with the following process.

1. Set UEFI driver on HBA system.
    (Refer to Chapter 2 Fibre channel setting (8Gbps FC card) and Chapter 2 Fibre channel setting (16Gbps FC card))
2. Run Boot Manager front page and [Boot Maintenance Manger] - [Boot Options] - [Set Legacy HardDiskDriverOrder]
3. Confirm the following screen.

If plural HDDs are not appeared, confirm how to recover multi-pass connection.

```
              Set Legacy HardDisk Drive Order

Change the order                          Change the order
0C00 FC 0000000000A80481.000
0D00 FC 0000000000A80481.000

Commit Changes and Exit
Discard Changes and Exit




↑↓=Move Highlight      <Enter>=Select Entry    Esc=Exit without Save
```
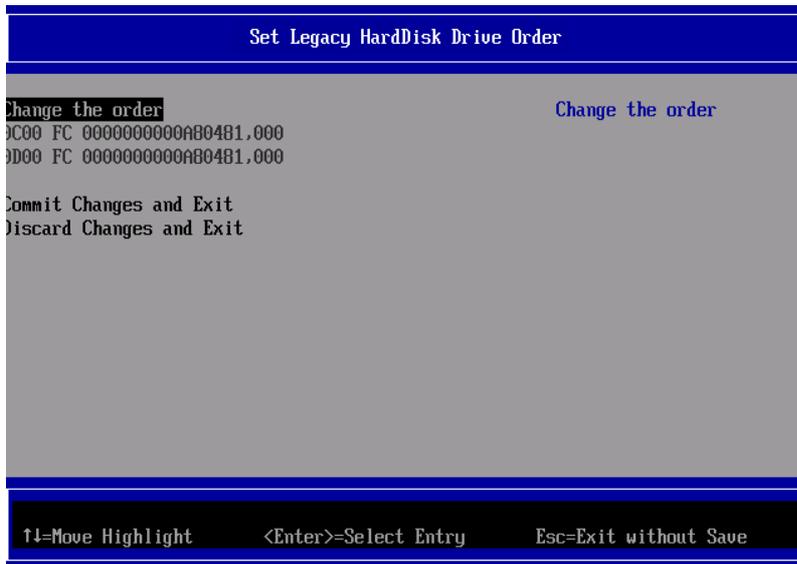
FIGURE 5.2 [Set Legacy HardDiskDriver Order] menu(Multi-pass)

4. If you confirm the plural HDDs, reboot Operation System.

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5.2 Using built-in disk with Linux

To use the built-in disk, you need make a setting in the UEFI so that the following disk is recognized first as the start disk: disk with which the SAN boot environment is configured on the SAN storage unit machine.

Therefore, after installing the operating system, perform the following additional steps to use the built-in disk.

Note: All screenshots appearing below are display examples whose contents vary depending on the system configuration, etc.

5.2.1 Checking the disk connection state before mounting the built-in disk

Execute the following command while the partition is operating to check the current disk connection state.

```
# ls -l /dev/disk/by-id
```

5.2.2 Mounting the built-in disk

Use the following command to shut down the partition.

```
# shutdown -h now
```

After powering off the partition, mount the built-in disk.

5.2.3 Configuring the RAID of the built-in disk (when using the SAS array disk unit)

Initialize the built-in disk inside a RAID configuration, for example, since the built-in disk will be recognized at the next startup. For details on building a RAID configuration with the built-in hard disk, see the MegaRAID SAS User's Guide and the MegaRAID SAS Device Driver Installation User Guide.

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5.2.4 Configuring the UEFI

Start the Boot Manager front page. Select [Boot Maintenance Manager] - [Boot Options]- [Change Legacy HDD Boot Priority]. Then, assign the boot disk that was built on the SAN storage unit to the top position.

The procedure for making this setting is as follows.

Starting the Boot Manager front page

1. Power on the target partition.
2. After one or two minutes, the window shown below appears. Press any key ([Space] key, for example) other than the [Enter] key while the FUJITSU logo is displayed.

FIGURE 5.3 Logo at startup

3. The Boot Manager front page appears. Use the down arrow key to select [Boot Maintenance Manager], which is the option at the bottom. Press the [Enter] key.

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FIGURE 5.4 [Boot Manager front page] screen

4. The [Boot Maintenance Manager] screen appears. Select [Boot Options]. Press the [Enter] key.
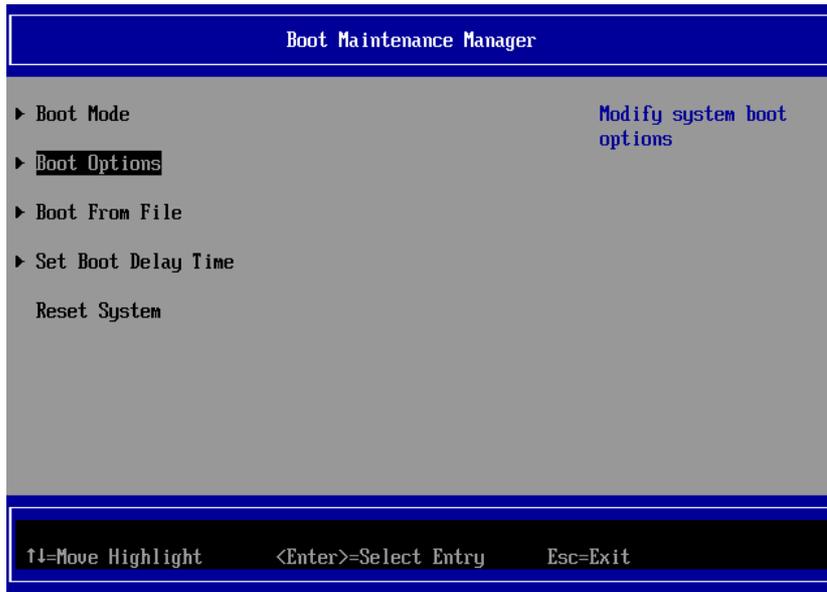
FIGURE 5.5 [Boot Maintenance Manager] screen

Setting the order of devices

1. The [Boot Options] screen appears. Select [Set Legacy HardDisk Driver Order]. Press the [Enter] key.

```
┌─────────────────────────────────────────────────────────────────────┐
│                           Boot Options                              │
├─────────────────────────────────────────────────────────────────────┤
│                                                                     │
│  ▶ Go Back To Main Page                    Set Legacy HardDisk       │
│  ▶ Add Boot Option                         Drive Order               │
│  ▶ Delete Boot Option                                               │
│  ▶ Change Boot Order                                                │
│                                                                     │
│  ▶ Set Legacy Floppy Drive Order                                    │
│  ▶ Set Legacy HardDisk Drive Order                                  │
│  ▶ Set Legacy DVD/CD-ROM Drive Order                                │
│  ▶ Set Legacy NET Drive Order                                       │
│                                                                     │
│                                                                     │
│                                                                     │
│                                                                     │
│                                                                     │
│                                                                     │
├─────────────────────────────────────────────────────────────────────┤
│  ↑↓=Move Highlight      <Enter>=Select Entry      Esc=Exit          │
└─────────────────────────────────────────────────────────────────────┘
```
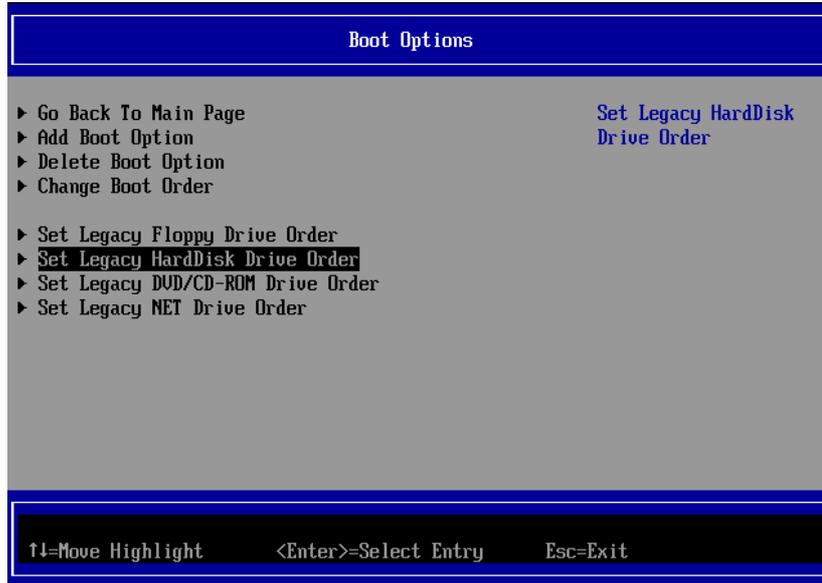
FIGURE 5.6 [Boot Options] screen (for setting the order of devices)

2. The [Set Legacy HardDisk Driver Order] screen appears.Select [Change Boot Order] . Press the [Enter] key.

```
┌─────────────────────────────────────────────────────────────────────┐
│                   Set Legacy HardDisk Drive Order                  │
├─────────────────────────────────────────────────────────────────────┤
│                                                                     │
│  Change the order                          Change the order          │
│  0E00 FC 000000005D6A0510.000                                       │
│  0800 SCSI 00.00                                                    │
│                                                                     │
│  Commit Changes and Exit                                            │
│  Discard Changes and Exit                                           │
│                                                                     │
│                                                                     │
│                                                                     │
│                                                                     │
│                                                                     │
│                                                                     │
│                                                                     │
│                                                                     │
├─────────────────────────────────────────────────────────────────────┤
│  ↑↓=Move Highlight      <Enter>=Select Entry      Esc=Exit without Save │
└─────────────────────────────────────────────────────────────────────┘
```
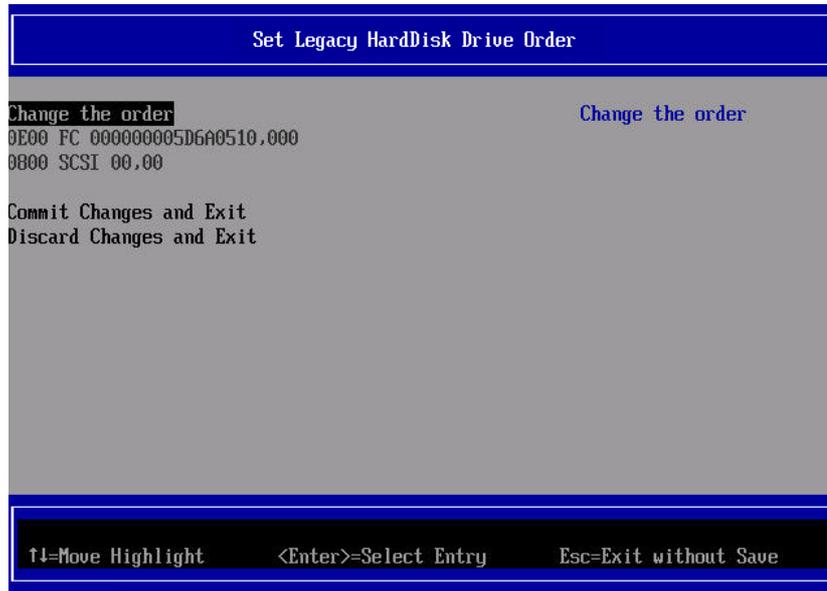
FIGURE 5.7 [Change the order] screen (for setting the order of devices)

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3. The following popup appears. Use the [+] key and [-] key to move FC to the top. Press the [Enter] key.
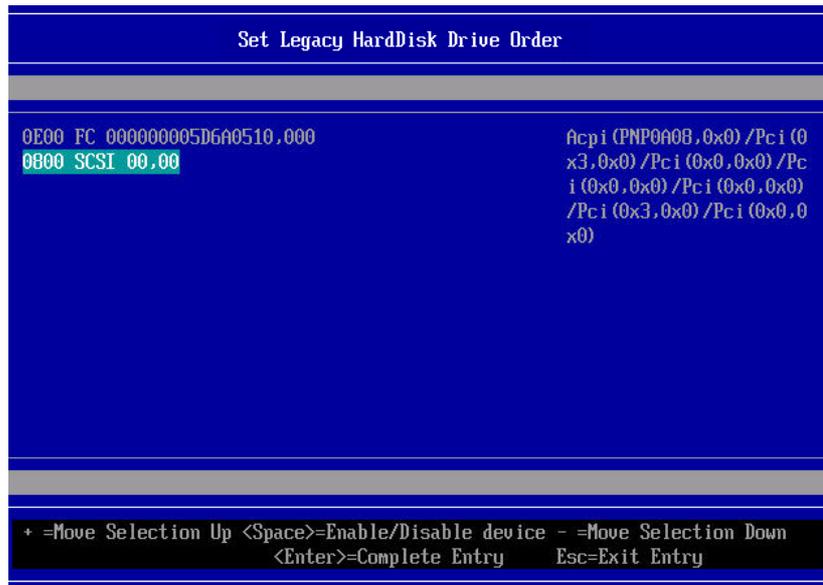
FIGURE 5.8 [Set Legacy HardDisk Driver Order] screen (for setting the order of devices)

4. Press the [Enter] key to return [Set Legacy HardDisk Driver Order] screen. Select [Commit Change and Exit], and then press the [Enter] key. Press the [ESC] key to return [Boot Manager] screen

Configuring an SAS disk as a non-boot device

1. Open the [Set Legacy HardDisk Drive Order] menu.
2. Select the HardDisk Drive #N that you want to disable. Press the [Space] key
3. Confirm that [//] appears on the front disabled SAS disk.

    Set the HardDisk Drive #N to disable.
    If there are multiple SAS disks, repeat the above setting for every SAS disk.
4. Press the [Enter] key to return from the popup screen.
5. Execute [Commit Changes and Exit] to exit.
6. Open [Set Legacy HarDisk Drive Order] again for confirmation.
7. Confirm the following:
    All HardDisk Drive set to SAS disk are disabled.

```
                  Set Legacy HardDisk Drive Order

Change the order                          Change the order
)C00 FC 0000000000A80481.000
)D00 FC 0000000000A80481.000
// 0B00 SCSI 01.00

Commit Changes and Exit
Discard Changes and Exit




↑↓=Move Highlight      <Enter>=Select Entry      Esc=Exit without Save
```

FIGURE 5.9 [Set Legacy HardDisk Driver Order] screen (Confirm SAS boot)

Starting the partition and confirming the built-in disk

After completing the UEFI setting, start the partition.

After starting the partition, execute the following command to confirm the difference between the current state and the state in which the built-in disk had not been mounted yet.

```
# ls –l /dev/disk/by-id
```

The disk that was confirmed not to exist before the addition of the built-in disk is the added built-in disk.

Creating partitions of the built-in disk

Create disk partitions in the built-in disk, and create a swap file system and other necessary files.

Remarks

Fujitsu recommends you to place the swap partition in the built-in hard disk. For details, contact your sales representative or a field engineer.

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5.2.5 Using a LUN of a non-boot disk

To use a LUN of a non-boot disk such as a data disk, you need to change settings on the ETERNUS side after operating system installation.
For details on the settings required on the ETERNUS when connecting to it, see the ETERNUS manuals at the following website:
http://www.fujitsu.com/global/support/products/computing/storage/disk/manuals/

5.2.6 Using other disks

To use the system while USB memory or another device recognized as a hard disk is mounted, the disk must be configured as a non-bootable device. Devices that are recognized as hard disks are added to the [Set Legacy HardDisk Drive Order] menu.

CHAPTER 6 Installing VMware attention

Refer to OS installation manual for the installation of VMware OS.

Regarding to how to install ESX, Carry out the procedure with install guide after getting install media

Required software

For details on the operating systems that support the SAN boot, the FC card/driver/firmware, and the FC card/firmware version, visit the following website. Also, the latest driver and firmware can be obtained from the following website. For a multipath configuration, the ETERNUS multipath driver is required.

- Driver/firmware website

http://support.ts.fujitsu.com/Download/

**Acquire the drivers and utilities for the FC card from the above website. For a multipath configuration, the ETERNUS multipath driver is required

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