

# PRIMEQUEST 2000 Series Converged Network Adapter FCoE Boot Configuration Manual

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## Introduction

This document is a manual of configuring FCoE Boot with Converged Network Adapter.



### Important

To configure the server, refer the following manuals.

<http://www.fujitsu.com/global/products/computing/servers/mission-critical/primequest/documents/manuals/>

## About this manual - for safe use -

This manual contains information to use this product safely. Before use of this product, read and understand this manual well.

We pay attention for users to use our products safely without harming neither users, other people, and their properties. When you use this product, follow the instructions in this manual.

## About this product

This product is designed and manufactured as for general use, such as in an office, personal use, household, and normal industry. Not for applications which are required extremely high safety (hereinafter referred to as "high-safety applications"), such as nuclear power control, aircraft flight control, air traffic control, mass transport operation control, life support, and weapons firing control, which involves serious risk against life unless safety is ensured.

Unless adopting measures for ensuring safety, do not use this product in such high-safety applications.

When you use this product in high-safety applications, before use, consult with our sales representatives.

## Storage of Attached Articles

Since attached articles are needed to operate server with, keep it in a safe place.



## Notation

### ■ Marks for safe use




In this manual we use some pictorial indications.

They are marks for using this product safely and preventing you and other people from suffering dangers nor damages.

Indication and it's meaning of the marks are as following. Please read and understand them well.



 <b>Warning</b>	If you ignore this warning and handle incorrect, there is possibility that causes serious injury or death.
 <b>Caution</b>	If you ignore this caution and handle incorrect, there is possibility that causes economic damages and physical damages.

In order to show type of warning and caution, in addition to the pictorial indicator described above, we use following symbols.

	△ symbol is what to tell that it is a warning or caution. Inside or under the symbol, specific action which is prohibited is shown.
	⊘ symbol is what to tell that it must not to act (prohibited acts). Inside or under the symbol, specific action which is prohibited is shown.
	● symbol is what to tell that it must be followed. Inside or under the symbol, specific instruction is shown.

### ■ Symbols in this manual

The symbols described in this manual has following meanings.

 <b>Important</b>	Note what you have to take care or what you must not do when you use this product. Be sure to read.
 <b>POINT</b>	Note what is associated with operation. Read if necessary.
<a href="#">(→P.nn)</a>	It shows reference page. You can move to the page with clicking here.

### ■ Key Operation and it's Representation

Representations of key operation are not explained with all of the characters described in keyboard. They are explained with the characters just required in the description as follows.

Ex.: 【Ctrl】key, 【Enter】key, 【→】key, etc.

Also, in case of pressing multiple keys at the same time, it is represented by connecting with as follows: "+".

Ex.: 【Ctrl】+【F3】key, 【Shift】+【↑】key, etc.

### ■ Representation of Consecutive Operation

In this manual, procedure of consecutive operations are represented as follow by connecting them with "→".

Ex: Click 「Start」button, then, point 「All Programs」, and then, click 「Accessories」

↓

「Start」button → 「All Programs」→「Accessories」

Click on this order.

## ■ Notation

In this document, these product names are referred to as shown below.

Product Name	Notation
Host Bus Adapter	HBA
Converged Network Adapter	CNA, This Product
Internet Small Computer System Interface	iSCSI
Fibre Channel over Ethernet	FCoE
Storage Area Network	SAN
World Wide Name	WWN
ServerView Installation Manager	SVIM
ServerView Suite	SVS
Preboot eXecution Environment	PXE
Unified Extensible Firmware Interface	UEFI, uEFI

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# 1. FCoE Boot Configuration

To build an FCoE Boot Environment, you are required to configure the Converged Fabric Switch and the FCoE Storage. This manual helps you understand for setup of Converged Fabric Switch and storage device.

In this setup, you should confirm WWN for CA ports of your target storage in FCoE Boot Environment.

We list basic components below which are required in constructing FCoE Boot environment of PRIMEQUEST 2000.

- 1) During FCoE Boot installation, keep out built-in disks from your server. After the installation, equip those disks to your server.

You can add built-in disk to your server to reduce I/O load.

- 2) Download the latest version of driver and firmware of Converged Network Adapter from the following URL and use them.

<http://support.ts.fujitsu.com/download/Index.asp>

## 2. Steps of Configuring FCoE Boot

We explain the steps of configuring FCoE Boot.

### **POINT**

In this document, we explain the steps to build FCoE Boot Environment on PRIMEQUEST 2000 series.

For information for setting and adjustment procedure of FCoE storage device and Converged Fabric Switch, refer to the manuals accompanying to each product.

For information for configuring the server, refer to the manual of the server.

You can get latest version of manual from web site of PRIMEQUEST 2000 series.

### Considerations at Introduction

At the time of the introduction of the system, consider following points.

- Before the introduction of the system, check the considerations about SVIM which are described in the "ServerView Suite Notes".

"ServerView Suite Notes" is posted on the following Web site.

<http://jp.fujitsu.com/platform/server/primequest/software/svs/>

- When you install OS, you have to install only boot disk for OS. To do so, you must have boot disks mounted in servers and keep out the other disks from the server.

According to the same reasons, you need to configure ETERNUS so that OS installer recognizes only the boot disk.

In the case of multi-path configuration, make only a single path (FC cable) connected.

### **Important**

After the installation of the system, if there are some changes of configuration as following, initialize the CNA at first, then reconfigure the CNA, and restart the server.

- In case that you register dump device of SAdump to the CNA.
- In case that you make some configuration change of SAN storage or FCoE switch, e.g. change of LUN mapping, change of host affinity, change of port zoning, etc.
- In case that you change OS boot path due to some configuration change.
- In case that, for expanding, you register the LUN devices to the CNA.

## Notes at System Operation

At the time of system operation, consider the following points.

- Before restart of your server, make sure that SAN storage devices and FCoE switch are ready to use.
- Until the partition is powered on, you can use MMB Web-UI to configure the partition.
- In a case as such a hardware failure occurs, the suspected unit may not be identified by temporary analysis on event logs.
- Record the date and time of replacing the server (including replacing or relocating the CNA).
- If you replaced the CNA with spare part, you have to reconfigure UEFI/extended BIOS on your server. And you have to reconfigure FCoE switch/SAN storage device.
- In SAN boot environment, depending on the quality condition of FCoE transmission path, the OS boot may be fail. In this case, administrator checks the alarm and the status of the system, and identifies the suspected unit in the FCoE switch and SAN storage device. In addition, select [Reset] in [Power Control] screen of the MMB Web-UI, and then restart the server.
- In Linux environment, if you use SAN boot with multi-path configuration, in order to do auto mount the disk of ETERNUS in Rescue Mode, make only one FCoE port enabled(linked), and boot from the port.
- As a multi-path configuration, it may not be able to start up properly.
- In addition, in order to avoid mistake of operation, even if you do not do auto mount, it is recommend that you make only one FCoE port enabled(linked) and boot from the port in Rescue Mode.

## Setting of Connection of ETERNUS

For more information about configuration which is required to connect ETERNUS, refer to the following Web site.

<http://storage-system.fujitsu.com/jp/catalog/manual.html>



### 3. Setting of PXE Boot Parameters

This section describes the modification procedure of CNA Personality setup.

#### POINT

Screen images of the utility might look different with the firmware version of the CNA, although, the items to be set to the utility are the same. Refer the screen images appropriately.

The following example shows Legacy mode.

You can change to Legacy mode from UEFI mode by Boot Maintenance Manager. (refer to 5.1 Section.)

#### 3.1. PXESelect Utility (Legacy mode)

During the system is starting up, if prompt of PXESelect Utility is displayed as shown below, then press <Ctrl> + <P> key.

```
Emulex 40/20/10Gb UNDI, PXE-2.0 BIOS v10.2.405.33
Copyright (C) 2006-2015 Emulex Corporation

<<< Press <Ctrl><P> for PXESelect(TM) Utility >>>

OCe14102-U      Controller#0 Port#0 Base 0xFA840000 at Bus:05 Dev:00 Fun:00
OCe14102-U      Controller#0 Port#1 Base 0xFA800000 at Bus:05 Dev:00 Fun:01
- Initializing ...Done.
```

Figure 3-1

As Controller Configuration screen is displayed, set MultiChannel to DISABLED.



Figure 3-2

Next, set Personality of CNA controller to "FCoE."

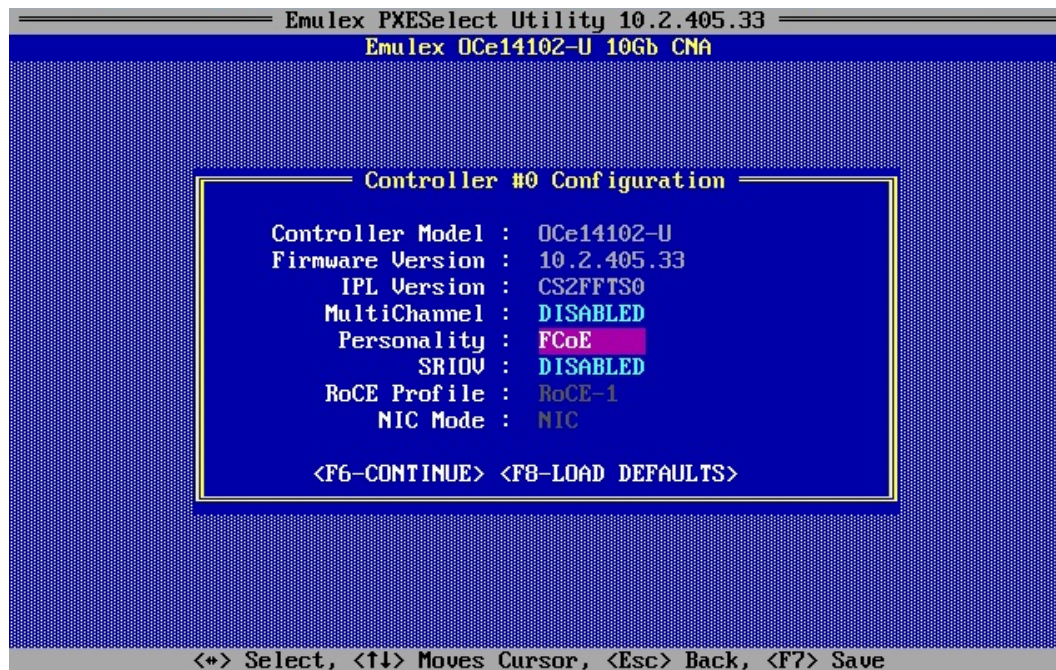


Figure 3-3

To save the settings, press <F7> key. If the screen as shown below is displayed, press <Y> key.

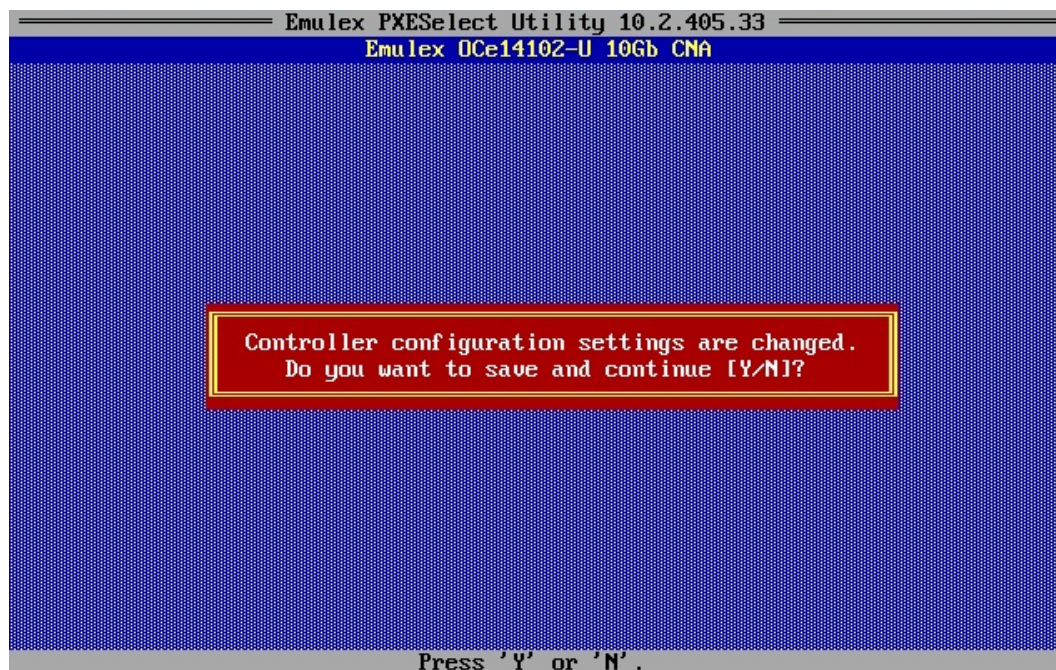


Figure 3-4



If the settings are saved, press [Esc] key to return to the previous screen.



Figure 3-5

As you return to the front screen shown in Figure 3-2, press [Esc] key to terminate PXESelect Utility. After that, the server restarts.

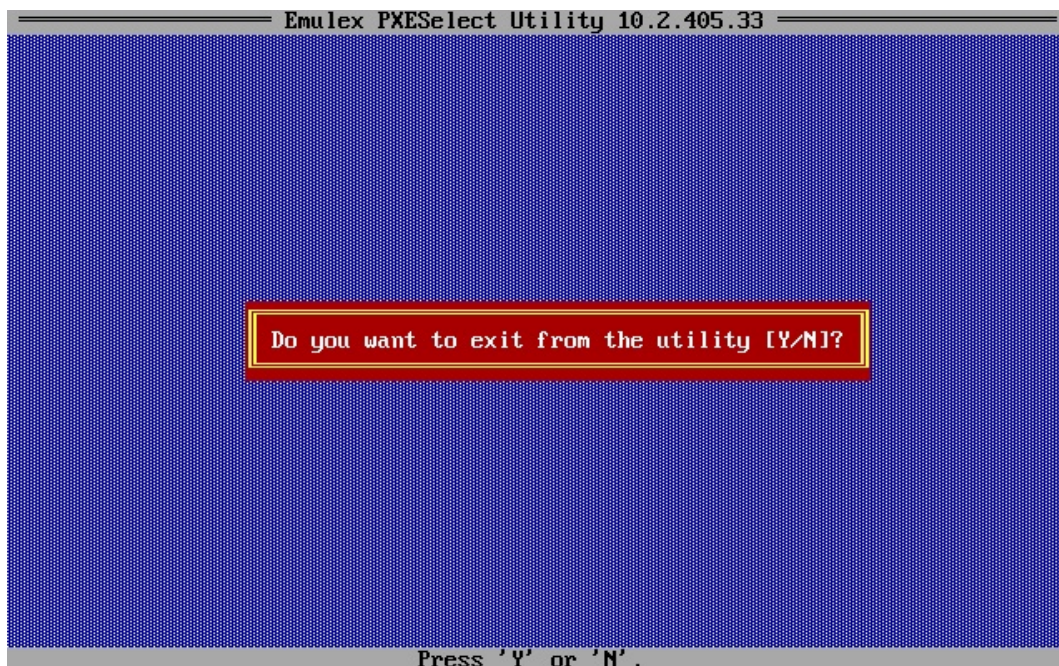
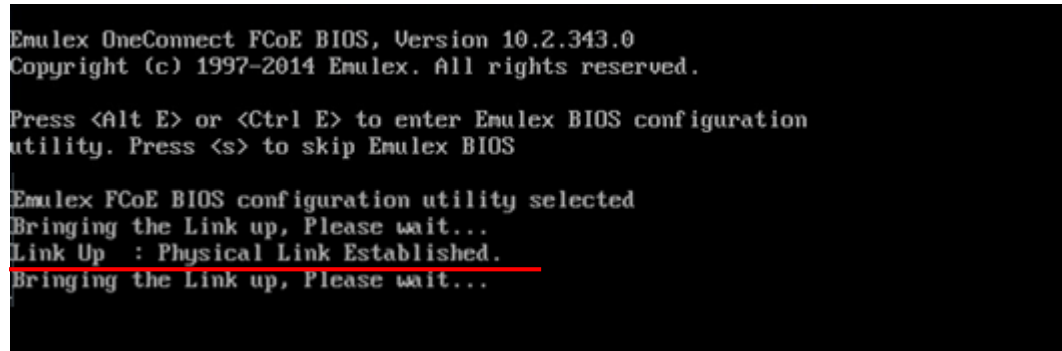


Figure 3-6

If the configurations of FCoE Boot including the configuration of FCoE Switch and the storage device that are described in previous chapters are properly done, during the server starts up, target path is linked up and a message as shown below is displayed in the BIOS startup screen.

Make sure that a message "Link Up: Physical Link Established" as shown below is displayed.

A screenshot of a BIOS startup screen for Emulex OneConnect FCoE BIOS. The text is white on a black background. It shows the version (10.2.343.0), copyright (1997-2014), and instructions to press <Alt E> or <Ctrl E> for configuration or <s> to skip. It then shows the configuration utility selected, the link being brought up, and the message "Link Up : Physical Link Established." which is underlined in red. The screen ends with "Bringing the Link up, Please wait...".

```
Emulex OneConnect FCoE BIOS, Version 10.2.343.0
Copyright (c) 1997-2014 Emulex. All rights reserved.

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

Emulex FCoE BIOS configuration utility selected
Bringing the Link up, Please wait...
Link Up : Physical Link Established.
Bringing the Link up, Please wait...
```

Figure 3-7

## 4. Configuring FCoE Boot (Legacy mode)

This chapter describes that procedure of configuring of FCoE Boot in Legacy BIOS.

### 4.1. Configuring FCoE Boot in Legacy BIOS

To configure FCoE Boot in Legacy BIOS, use BIOS utility.

During the server starts up, if the message "Press <Alt E> or <Ctrl E> to enter Emulex BIOS configuration utility" as shown below is displayed, press <Alt E> key or <Ctrl E> key immediately (Less than 5 seconds).

```
Emulex OneConnect FCoE BIOS, Version 10.2.343.0
Copyright (c) 1997-2014 Emulex. All rights reserved.

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

Emulex FCoE BIOS configuration utility selected
```

Figure 4-1

List of adapters(controllers) which are mounted in the server is displayed as shown below, and then, select subject adapter(controller), and press <Enter> key.

```
Emulex OneConnect FCoE BIOS Utility, NB 10.2.343.0

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. OCe14102-U:      Bus:05 Dev:00 Func:03   WWPN: 10000090FA75C44D
2. OCe14102-U:      Bus:05 Dev:00 Func:02   WWPN: 10000090FA75C445

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

Copyright (c) 1997-2014 Emulex. All rights reserved.
```

Figure 4-2

"Emulex OneConnect FCoE BIOS Utility" screen is displayed to set parameters of FCoE Boot.

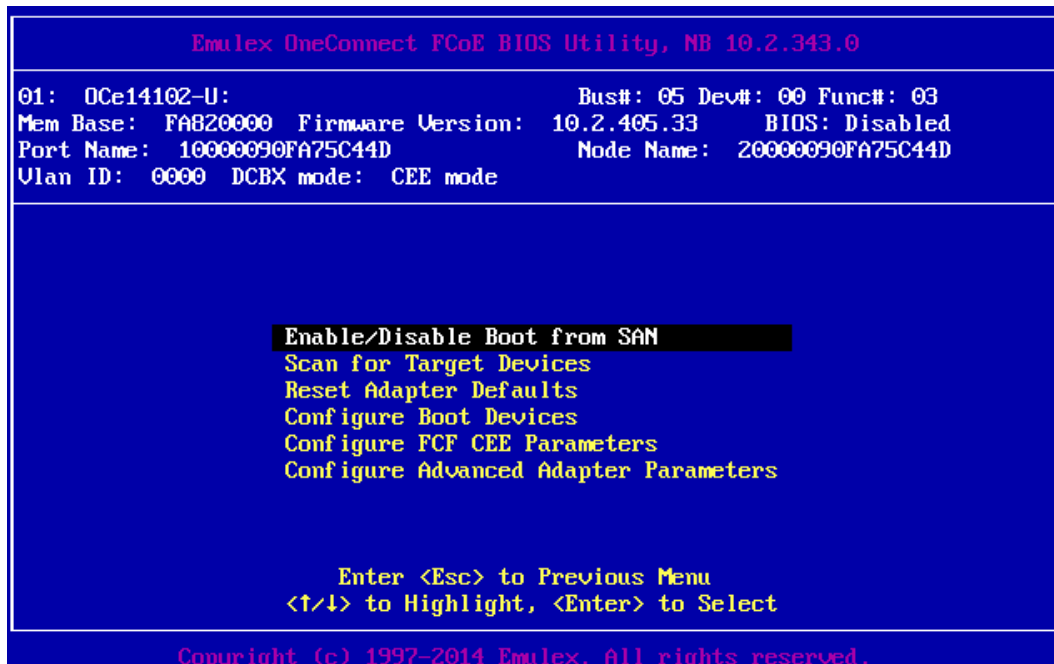


Figure 4-3

## 4.2. Enabling of Boot BIOS of CNA

To enable FCoE Boot of the CNA, select [Enable/Disable Boot from SAN] in main menu of Emulex OneConnect FCoE BIOS Utility screen, and press <Enter> key.

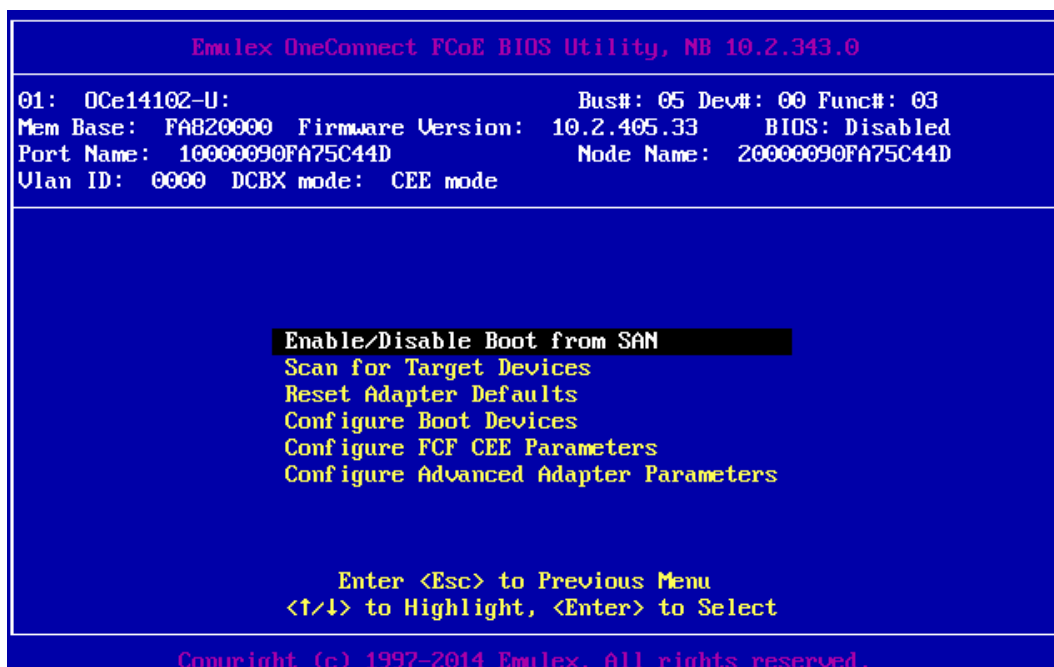


Figure 4-4

In the screen as shown below, select "Enable", and press <Enter> key.  
The default value for the Boot BIOS is "Disable".

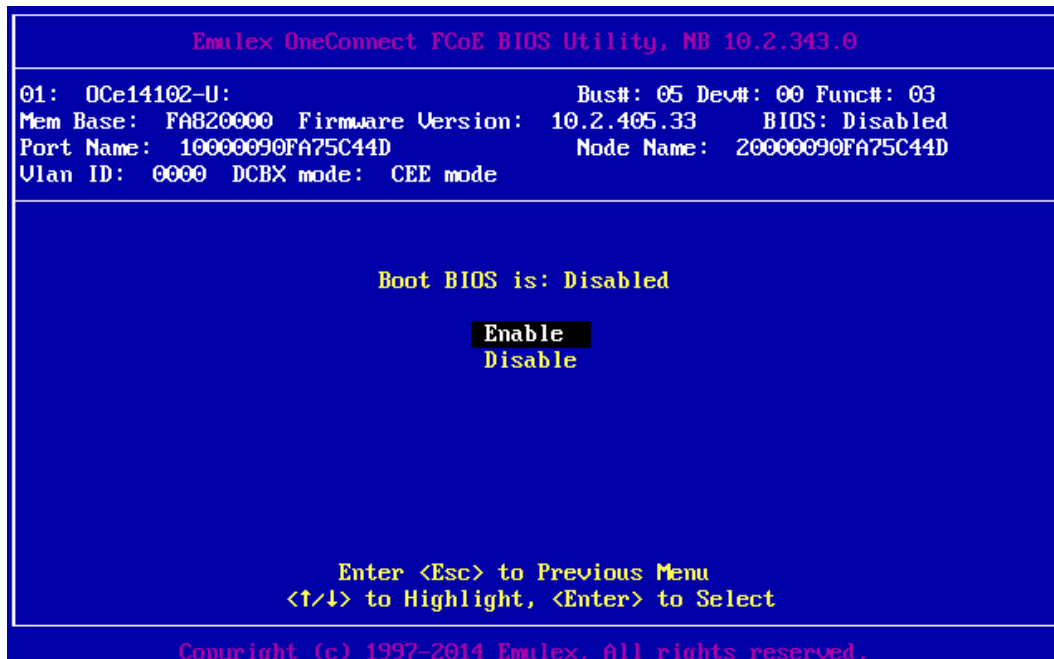


Figure 4-5

To use FCoE Boot function, enable Boot BIOS of at least one CNA.

If you enabled the Boot BIOS, status of Boot BIOS changes as shown below (red line part).

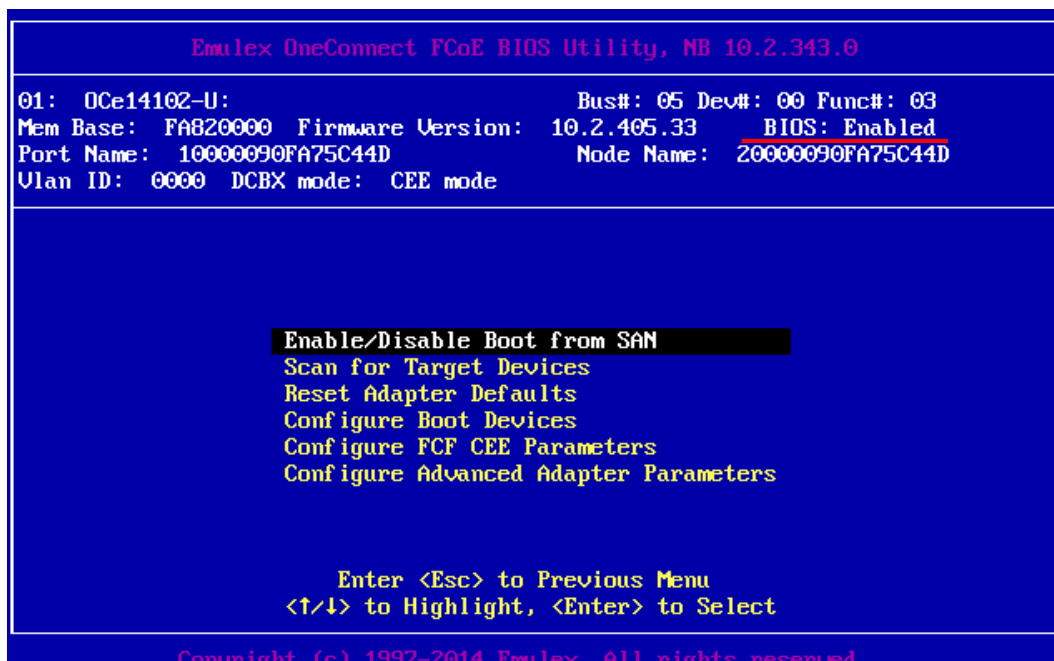


Figure 4-6



### 4.3. Scanning of Target Device

To scan the target device, select [Scan for Target Devices] in menu of Emulex OneConnect FCoE BIOS Utility screen, and press <Enter> key.

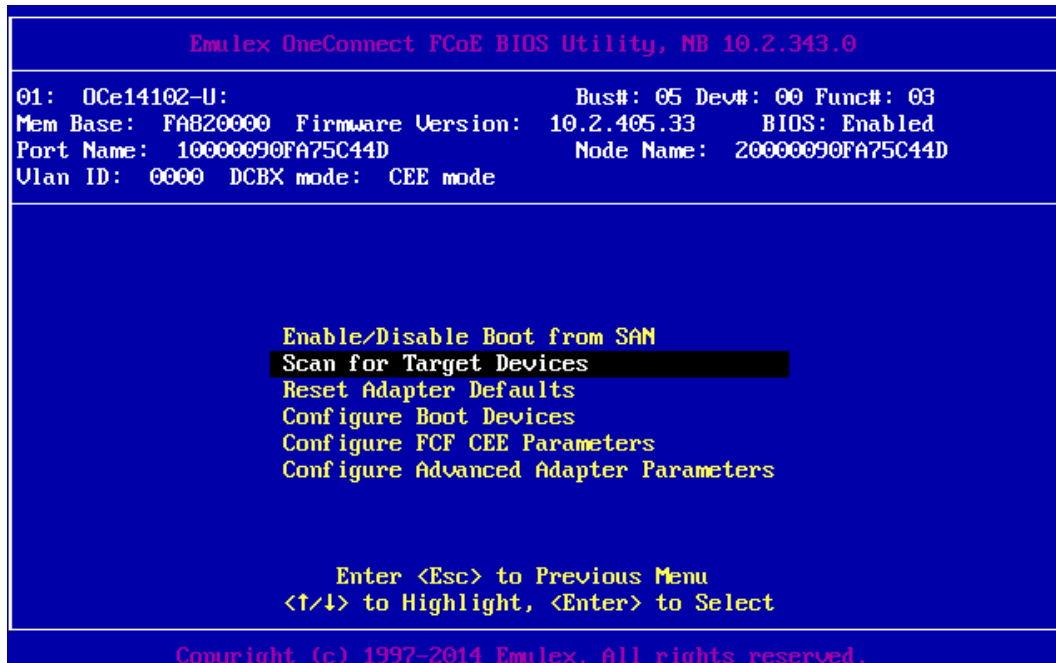


Figure 4-7

Scanning of the target devices is performed, a list of the target devices is displayed as shown in the figure below. In this screen, only the target device which is detected is displayed.



Figure 4-8

Make sure that WWN and LUN of the target storage is displayed correctly.



## 4.4. Configuring of Boot Device

To configure boot device, select [Configure Boot Devices] in menu of Emulex OneConnect FCoE BIOS Utility screen, and press <Enter> key.

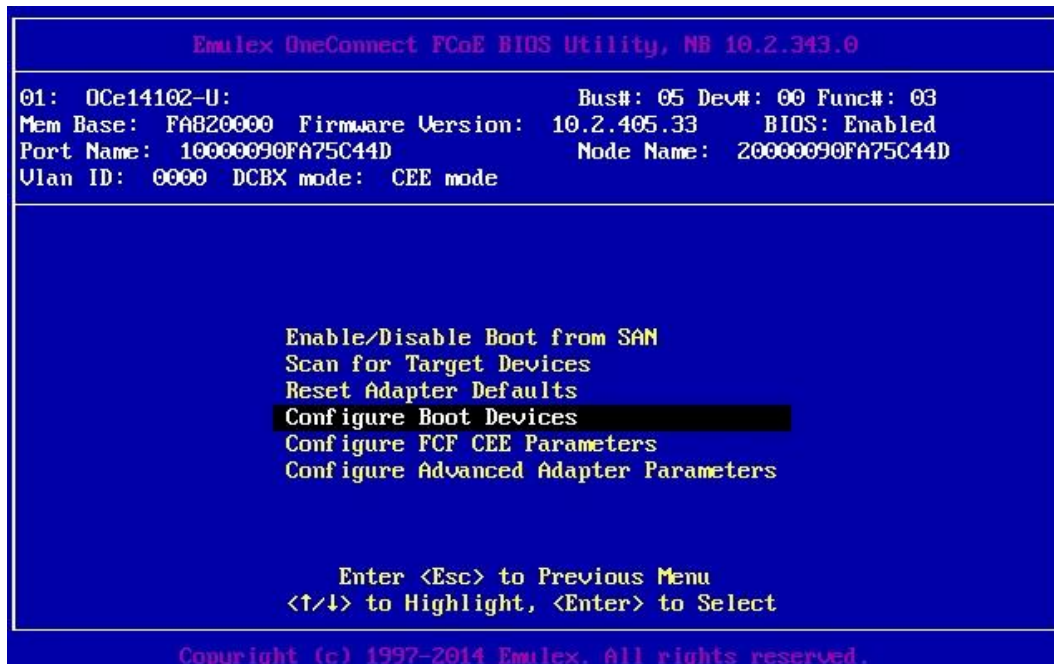


Figure 4-9

8 boot devices are listed. It is recommended that you configure against only devices which can be booted. You should not configure against devices which can't be booted.

Primary Boot Device is a device that is booted first and is displayed being added "Primary Boot" in rightmost column of the line as shown below.

If the system hit a hardware error and failed to boot the first entry, it boots from the next bootable entry.

Select a boot entry, and press <Enter> key.

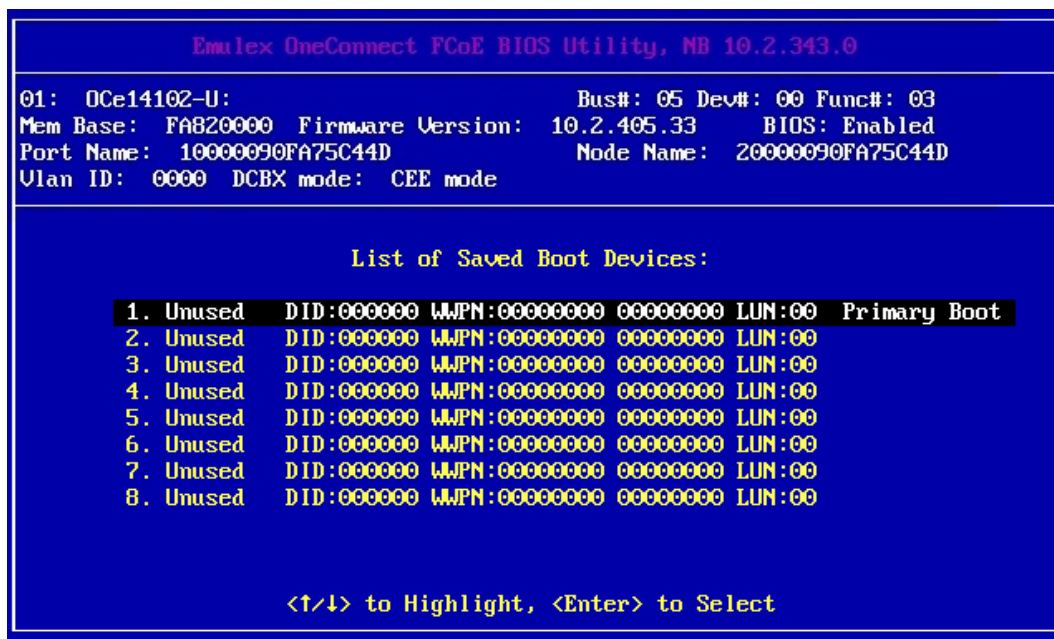


Figure 4-10

Identify the boot device from the list with DID or WWPN, and select it, and press <Enter> key. (Below is an example selecting <01>)

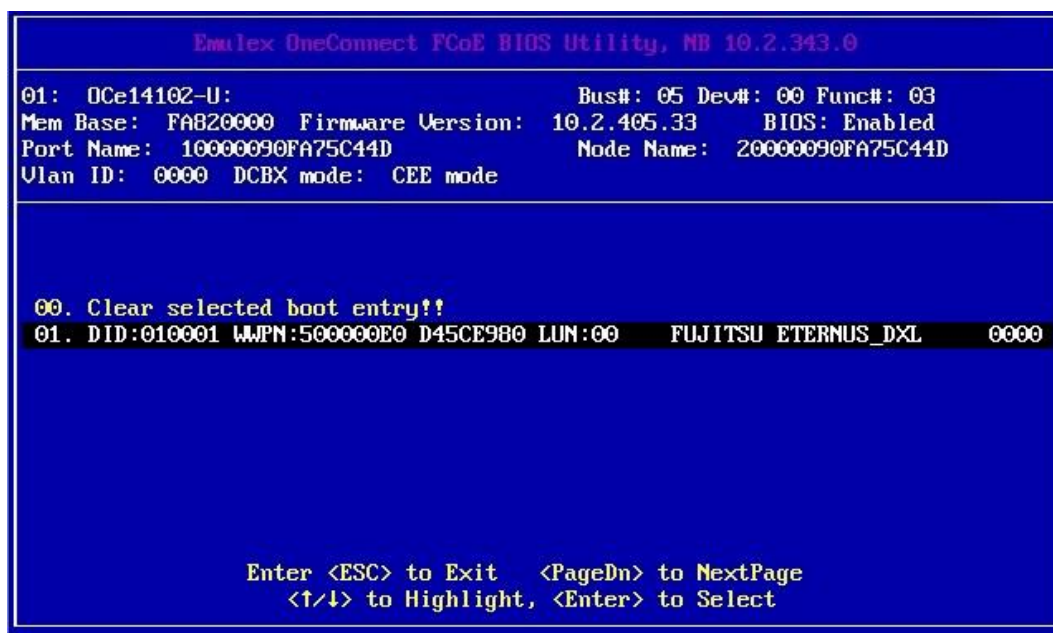


Figure 4-11

Pull-down menu is displayed as shown in the figure below.

#### POINT

There is a need to enter LUN in the form. Using up-arrow or down-arrow, enter the LUN in hexadecimal format, and press <Enter>.

LUN can be from 0 to 255.



Figure 4-12

Press <Enter> key.

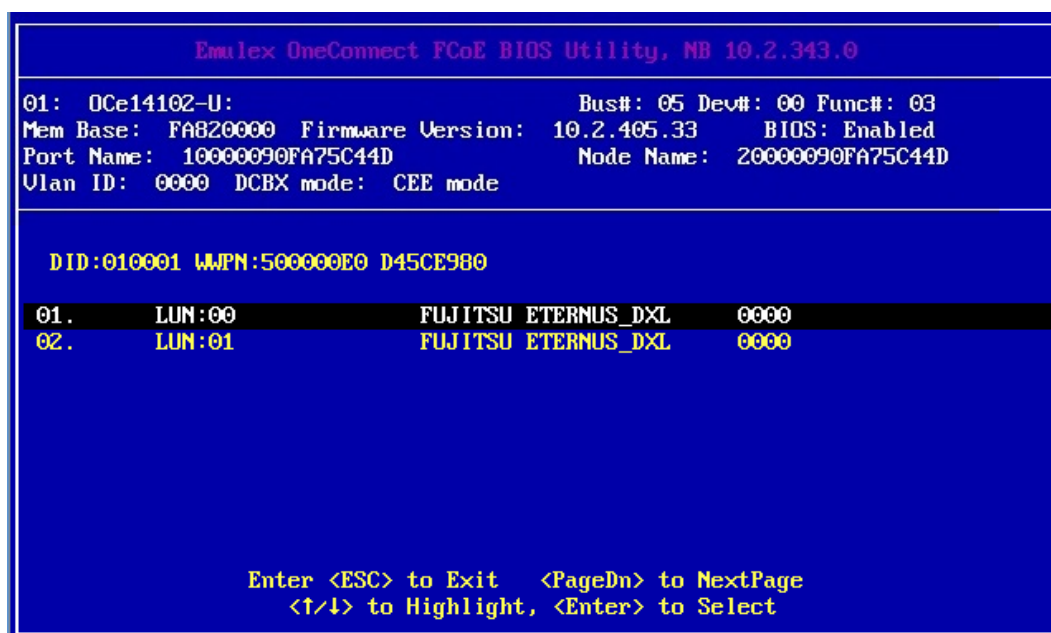


Figure 4-13

Boot device menu is displayed as shown in the figure below.



Figure 4-14

Using up-arrow or down-arrow, select a way to boot. If you select WWPN, The WWPN entry you select is saved in flash memory. If you select DID, The DID entry you select is saved in flash memory.

Press <Enter> key.

Press <Esc> key to return to the previous screen. In the screen, the status of target device is changed to the "Used". Make sure that the status of target device is "Used".

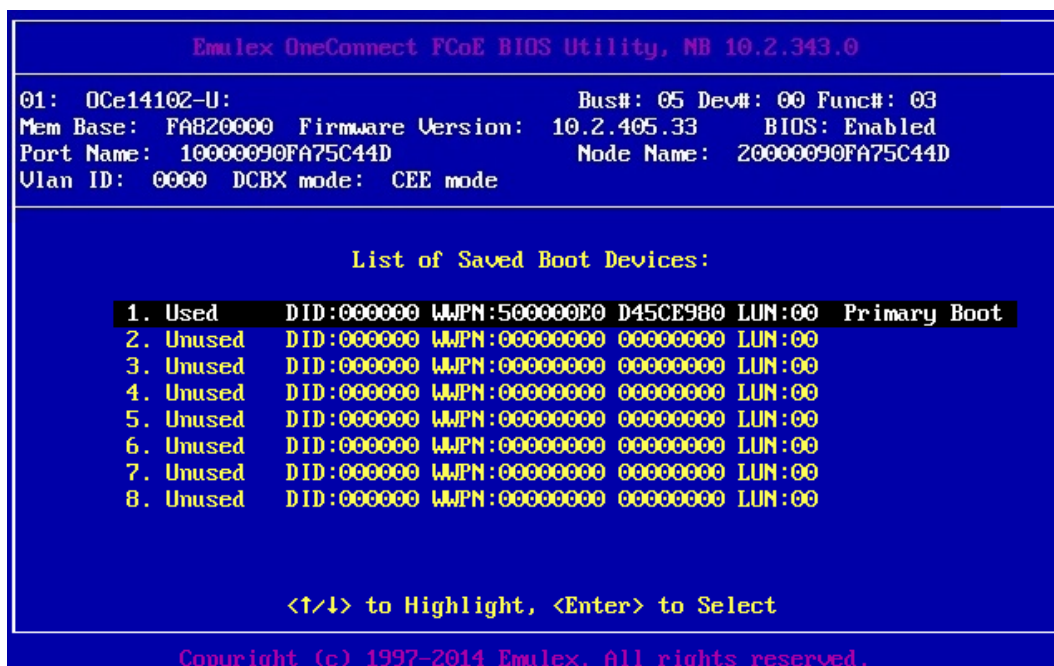


Figure 4-15

## 4.5. Advanced Setting of Adapter's Parameters

To set detailed parameters of the adapter, in main menu of BIOS Utility, select "Configure Advanced Adapter Parameters" as shown below figure and press <Enter> key.

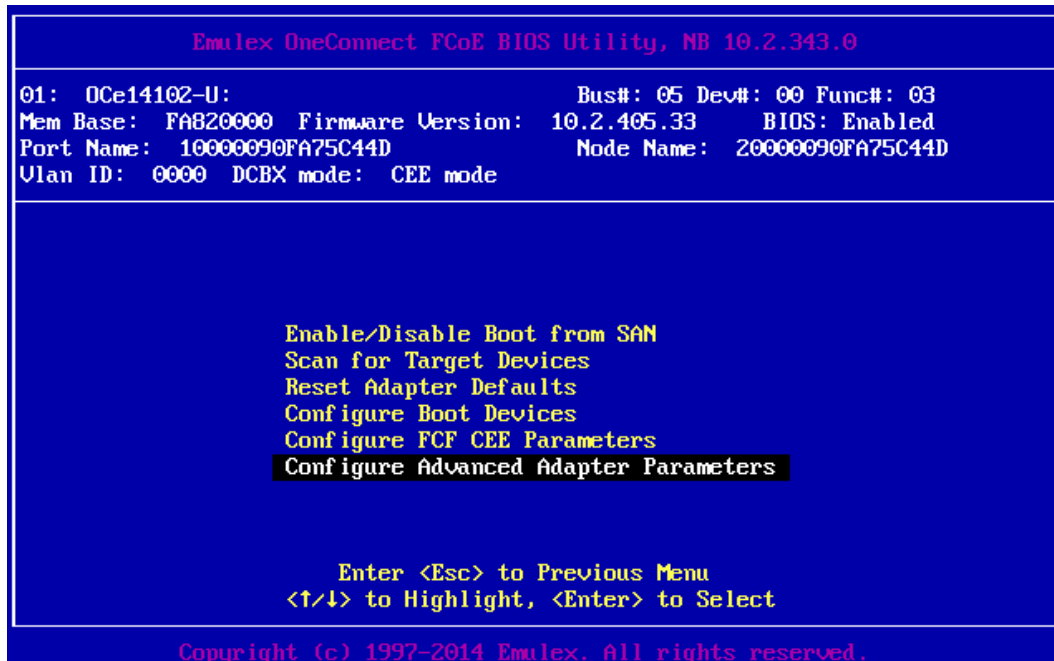


Figure 4-16

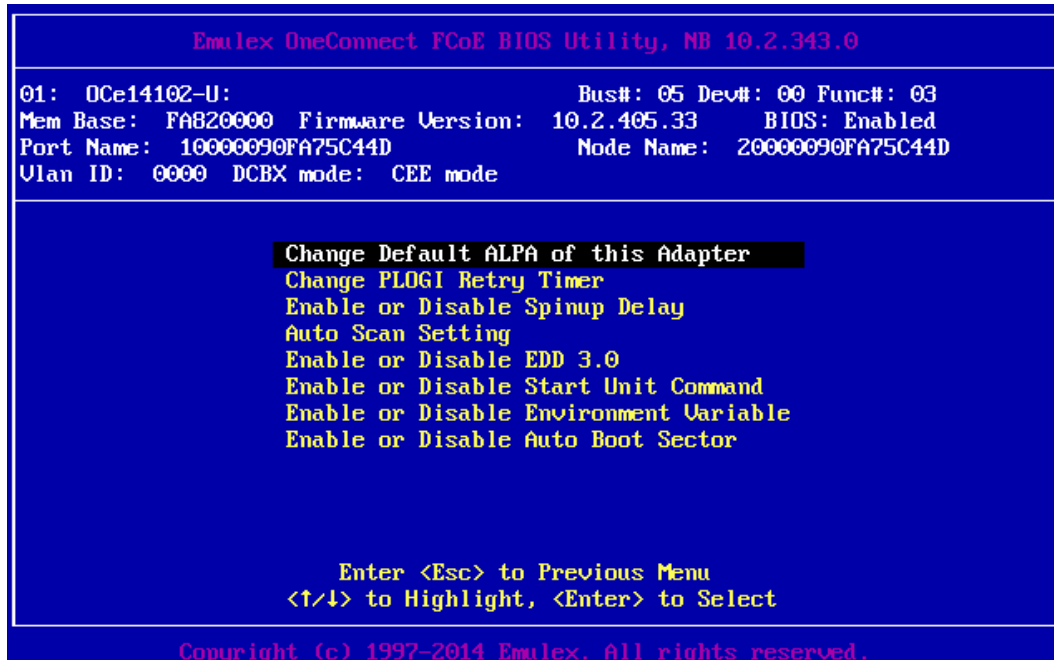


Figure 4-17

### 4.5.1. Changing Default ALPA (Arbitrated Loop Physical Address)

#### Important

This option is applied to Arbitrated Loop (FC-AL) connection.

FCoE protocol does not support FC\_AL connection. So, this parameter is not needed to set.

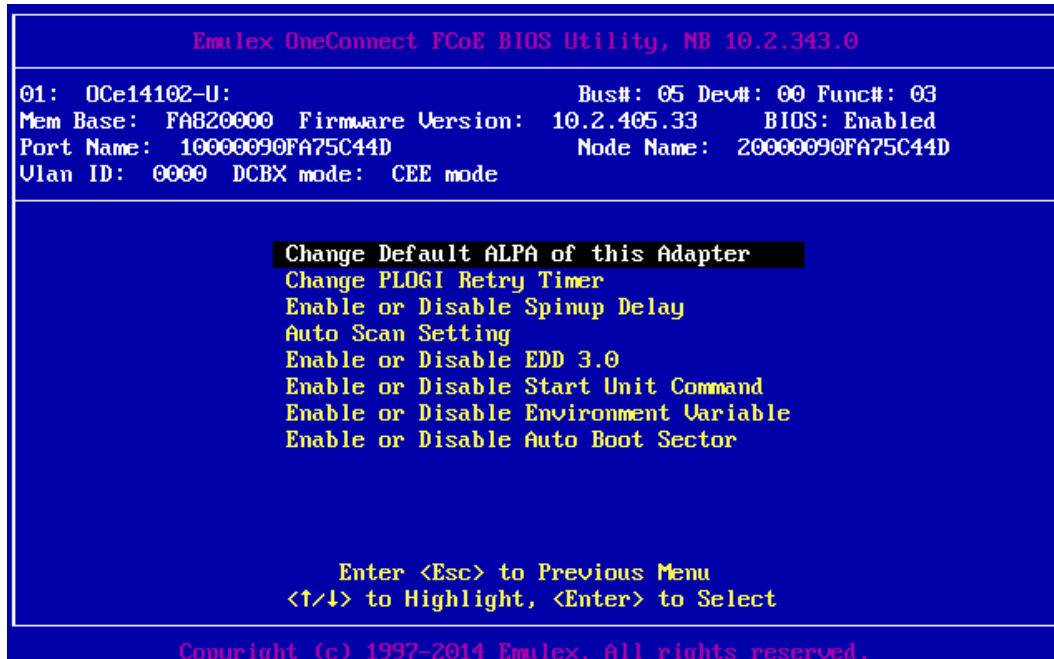


Figure 4-18

#### 4.5.2. Changing PLOGI Retry Timer

When port resumes operating, it scans the loop to detect device. PLOGI (Port Login) Retry Timer is time one PLOGI takes to scan entire of the loop. (Default value is 0 msec.)



Figure 4-19

#### 4.5.3. Enable or Disable Spinup Delay

This option allows to enable or disable the Disk Spin-up Delay.

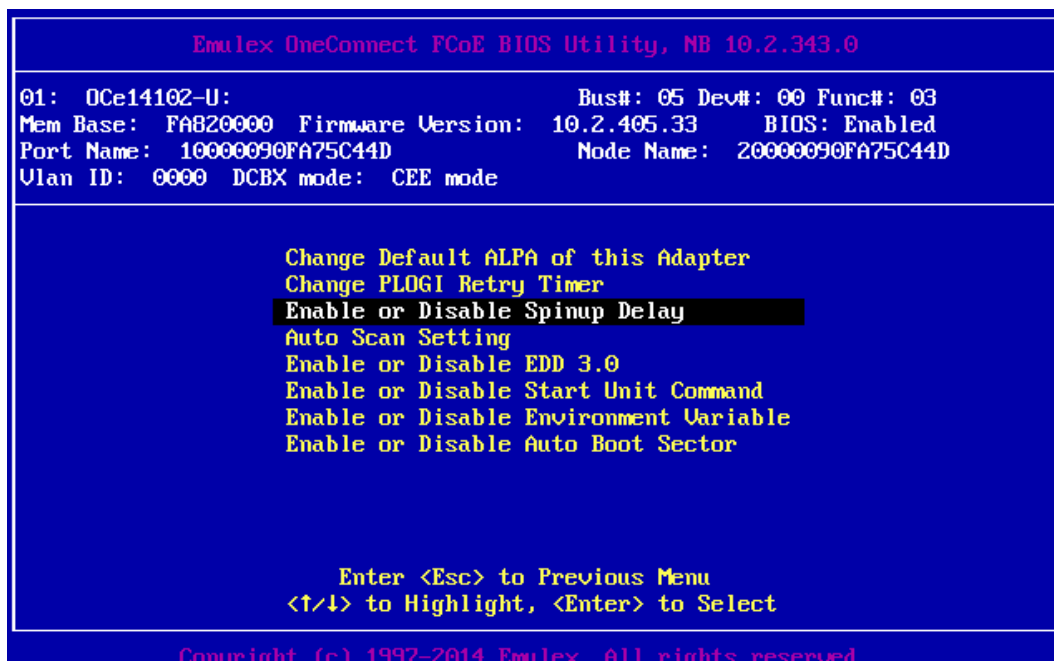


Figure 4-20



#### 4.5.4. Auto Scan Setting

This option, in order to issue query to the name server, allows to enable Auto Scan of LUN device and to enable the first device in the boot entry list.

Select "Auto Scan Setting", and press <Enter> key.



Figure 4-21

Auto Scan Setting menu is displayed.



Figure 4-22



Select 「First LUN 0 device」, and press <Enter> key.



Figure 4-23

#### 4.5.5. To Take Effect of Settings

After you complete settings, as described above, in FCoE BIOS Utility menu, press <Esc> key, and exit this menu.

A message as below in the figure displays, enter <Y> to reboot the system. So the settings you have done are taken effect to the system.

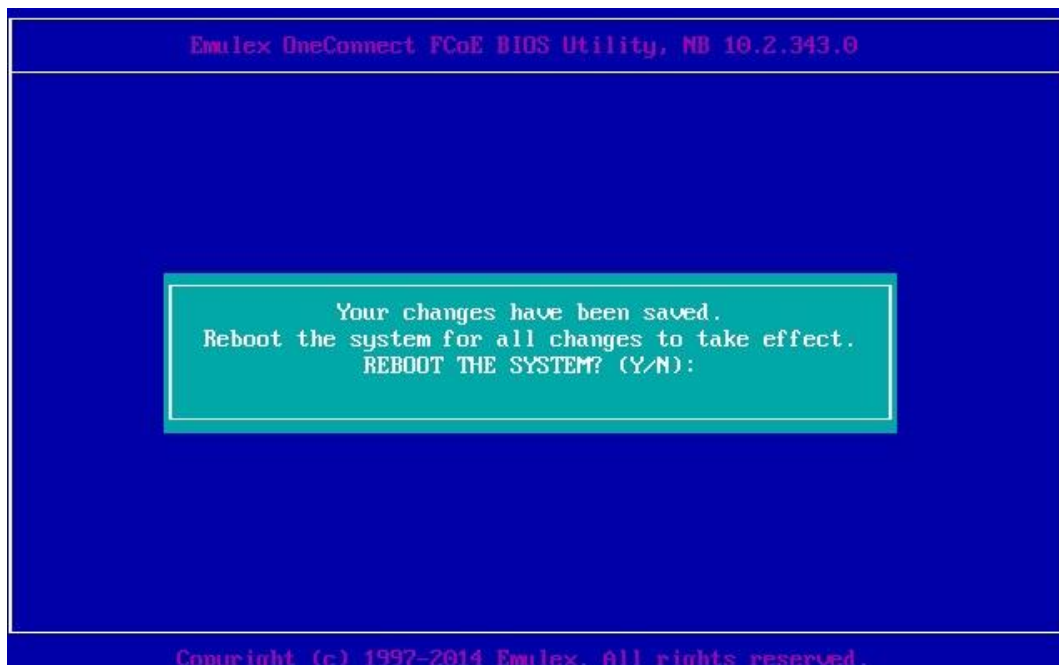


Figure 4-24

If you have done till "4.5.5. To Take Effect of Settings", go to "6. OS Installing".

## 5. Configuring FCoE Boot in UEFI

This chapter describes that procedure of configuring of FCoE Boot in UEFI.

### 5.1. Startup Converged Network Adapter in UEFI mode

To install OS in UEFI mode, startup converged network adapter in UEFI mode.

During the server starts up, if screen as shown below is displayed, press <F1> key immediately.

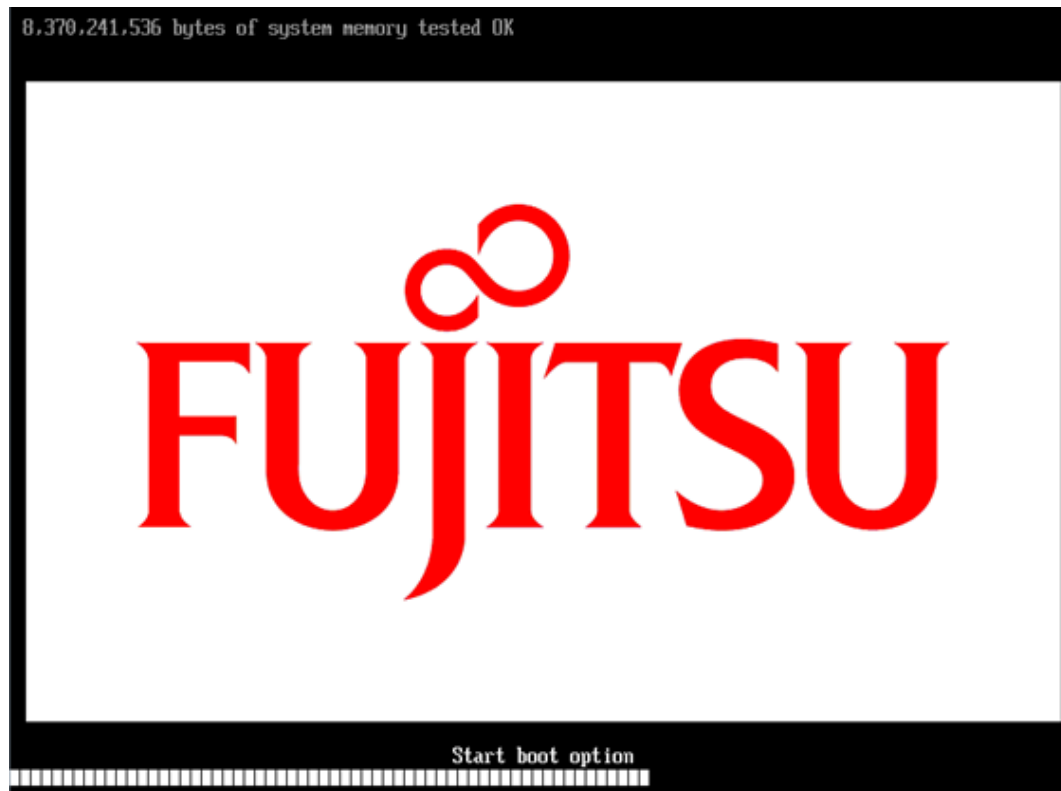


Figure 5-1

UEFI menu as shown below in the figure is displayed. Select [Boot Maintenance Manager], and press <Enter> key.



Figure 5-2

### 5.1.1. Changing Boot Mode

In Boot Maintenance Manager, select [Boot Mode], and press <Enter> key.

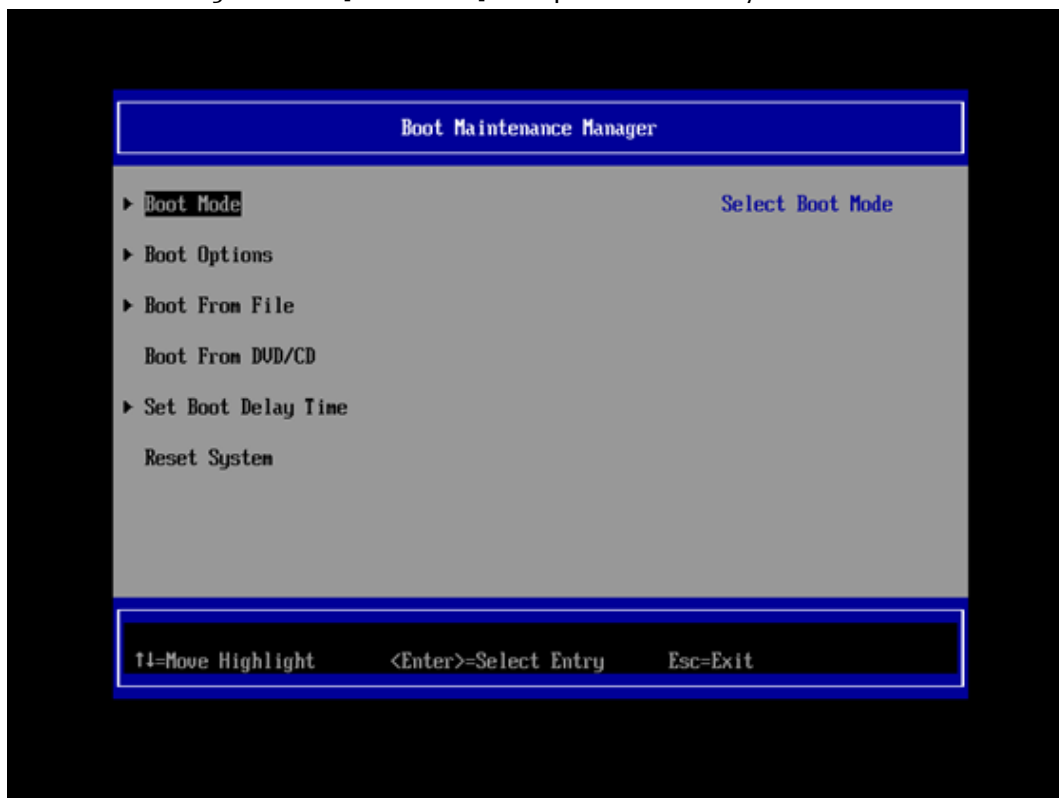


Figure 5-3

As Boot Mode screen is displayed, move cursor onto <UEFI and Legacy>, and press <Enter> key.

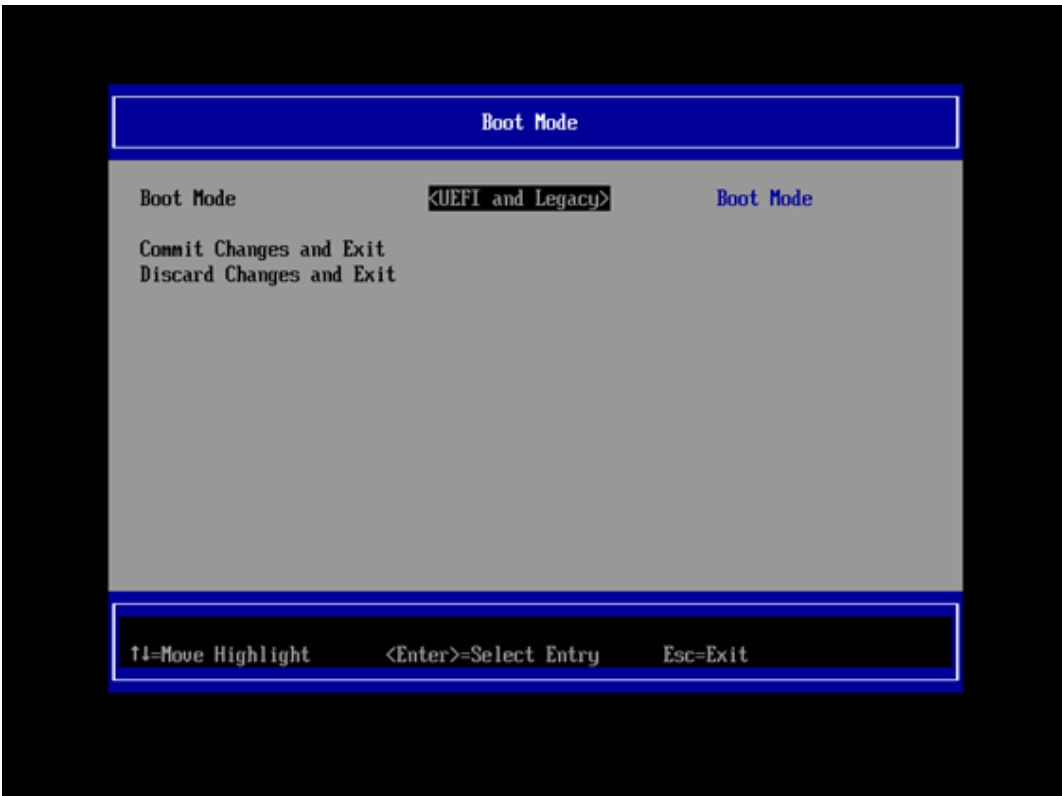


Figure 5-4

When a menu like the following picture is displayed, select [Only UEFI], and press <Enter> key.

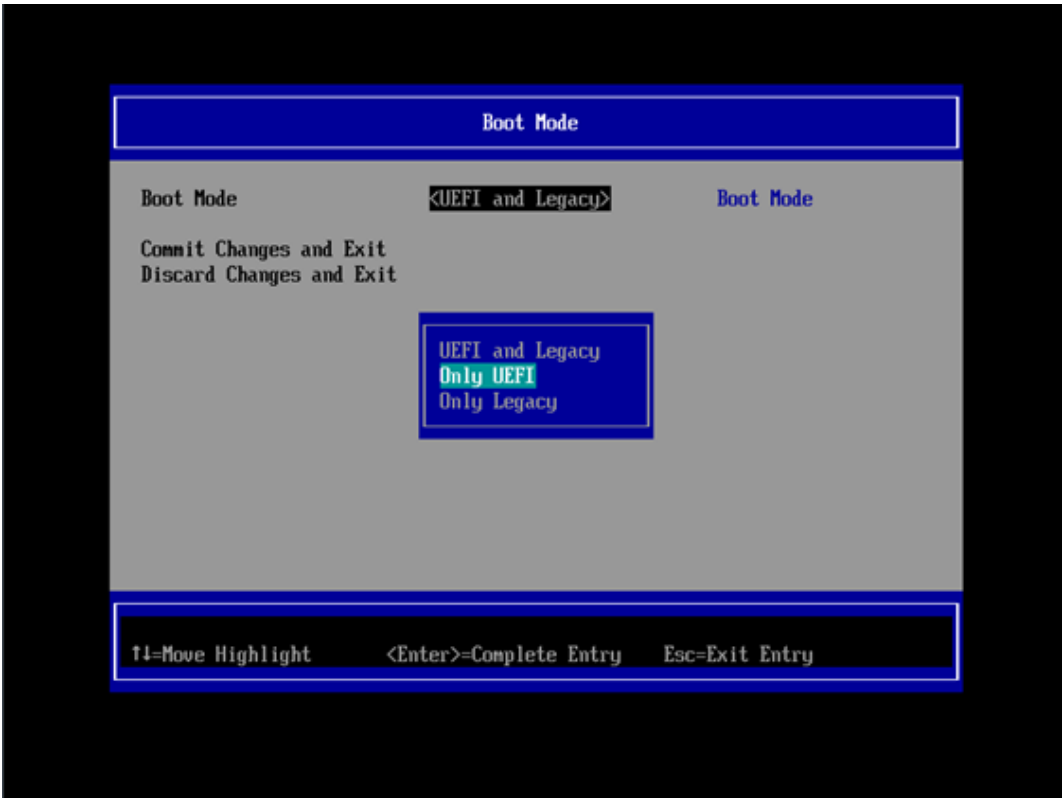


Figure 5-5

To take effect of the settings to the system, move cursor onto [Commit Changes and Exit], and press <Enter> key.

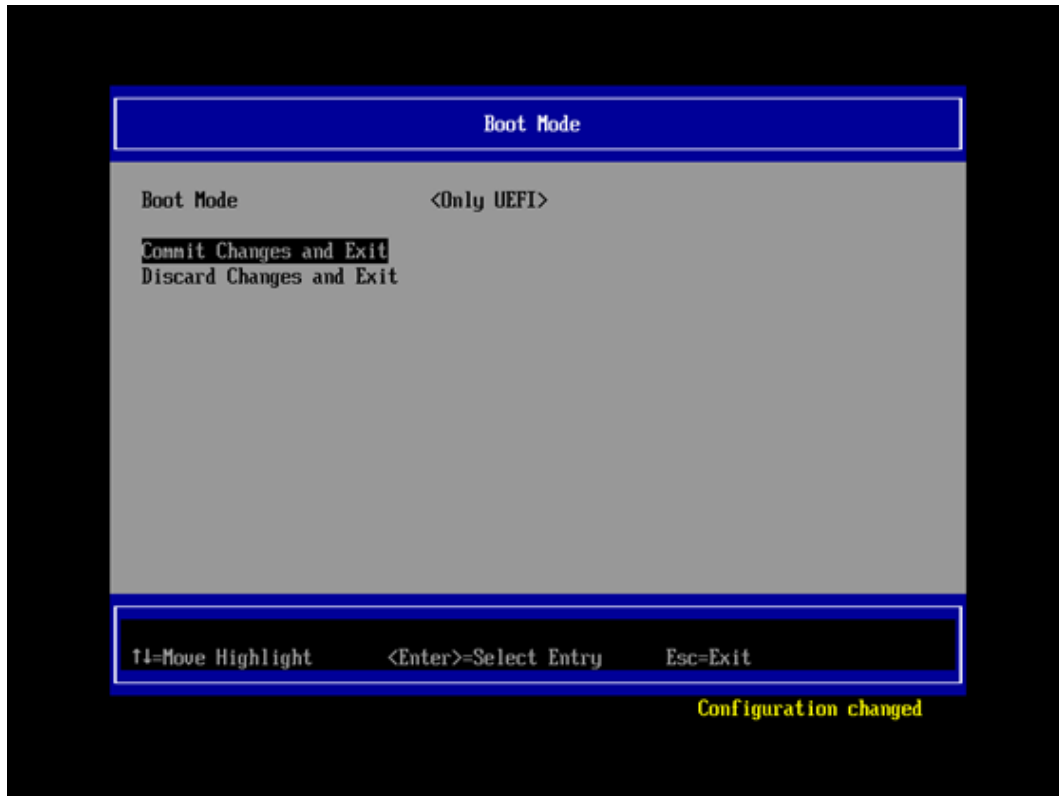


Figure 5-6

### 5.1.2. Changing Setting of PCI ROM Priority

Pressing <ESC> key in Boot Maintenance Manager screen, return to main menu (Figure 5-2), and move cursor onto [Device Manager], and press <Enter> key.



Figure 5-7

As Device Manager screen is displayed, move cursor onto [PCI Subsystem Configuration], press <Enter> key.

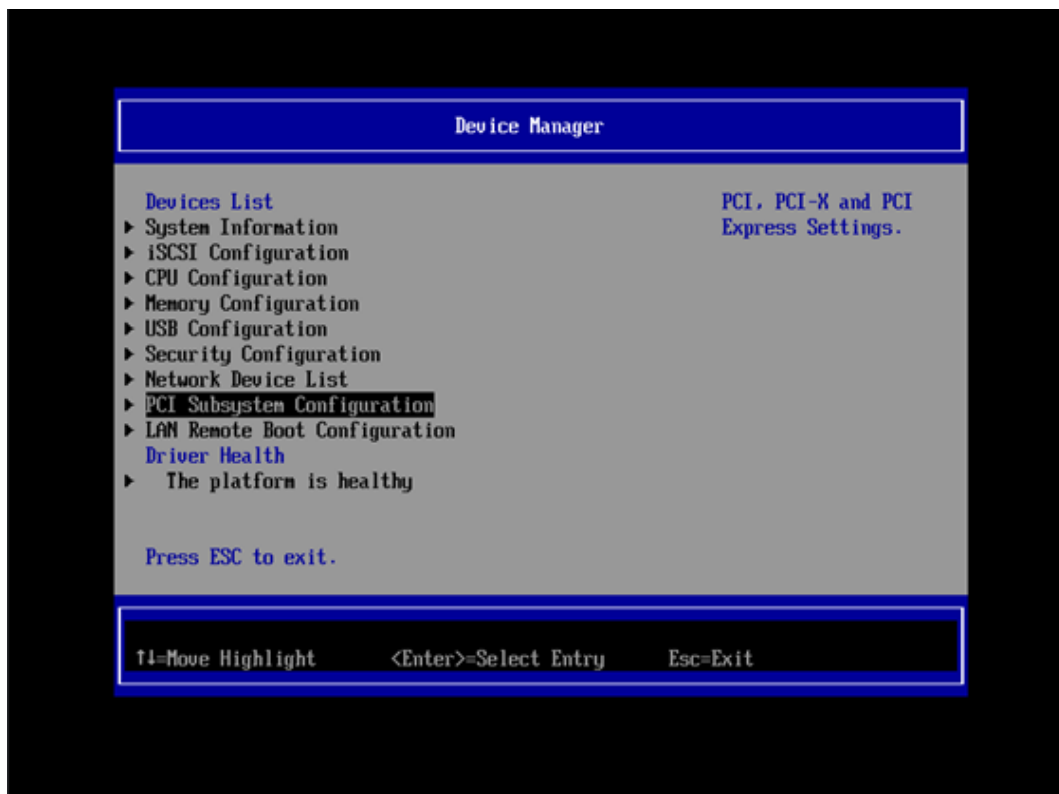


Figure 5-8

As PCI Subsystem Configuration screen is displayed, move cursor onto <Legacy ROM> at PCI ROM Priority, and press <Enter> key.



Figure 5-9

As pull-down menu is displayed as shown in the figure below, move cursor onto [EFI Compatible ROM], press <Enter> key.

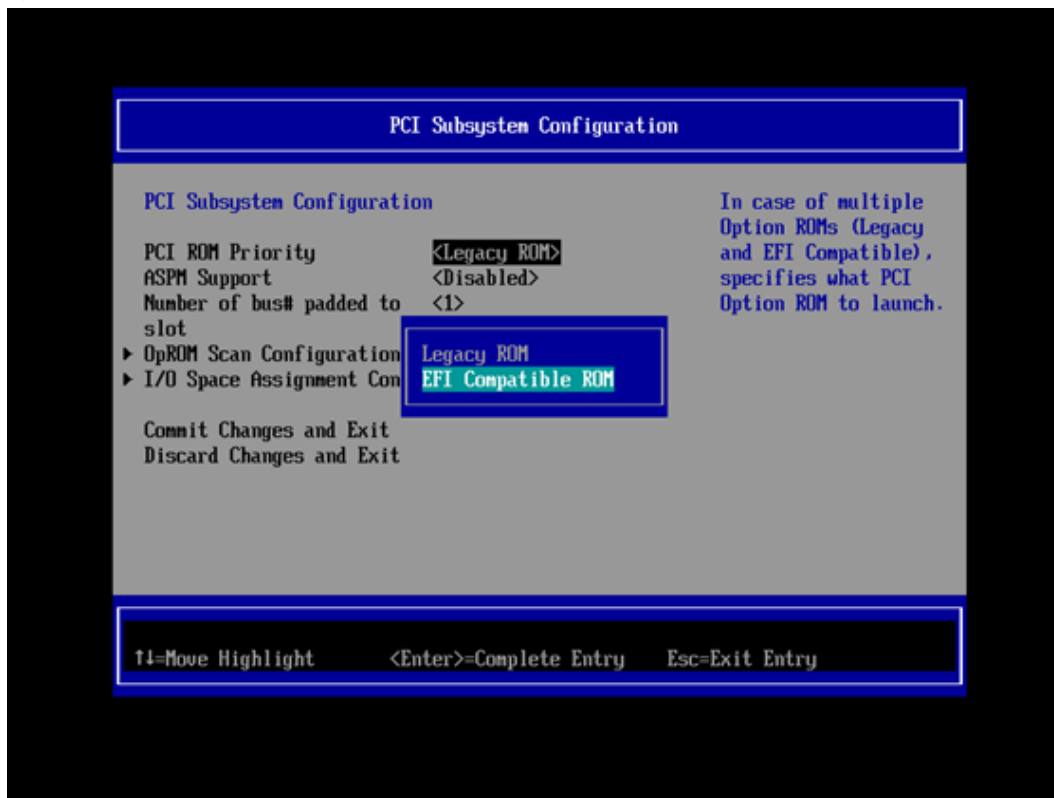


Figure 5-10

To commit the settings, move cursor onto [Commit Changes and Exit], and press <Enter> key.



Figure 5-11

If you have completed the settings described till here, restart the system.

## 【Reference】

We show an example of a procedure to restart the system. In main menu, move cursor onto [Boot Maintenance Manager], and press <Enter> key.



Figure 5-12

In Boot Maintenance Manager menu, move cursor onto [Reset System], and press <Enter> key to restart the system.

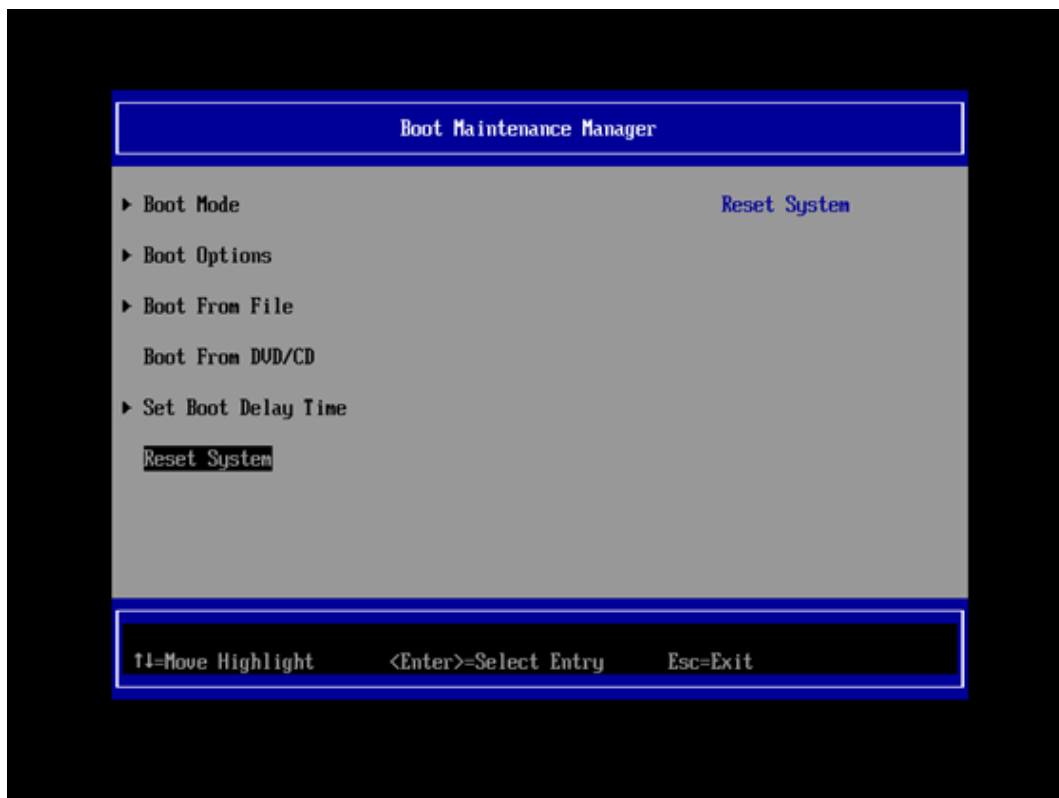


Figure 5-13



## 5.2. Setting in Device Manager

Open UEFI main menu by doing the procedure described in 5.1. Section.

Move cursor onto [Device Manager], and press <Enter> key.



Figure 5-14

If the settings has been set correctly, in Devices List of Device Manager screen, the Converged Network Adapters (e.g. "Emulex OCE14102-U 10Gb CNA - FCoE") are displayed by the amount of the number of ports.

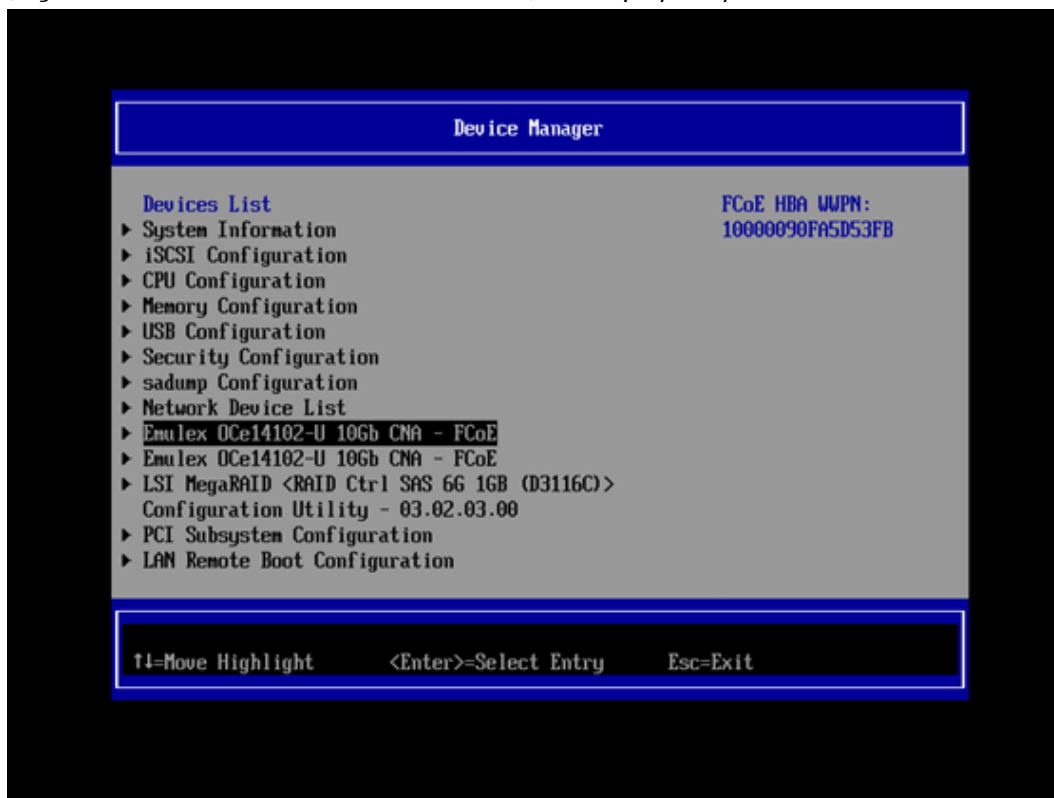


Figure 5-15

### 5.3. Settings of Boot of Converged Network Adapter

Select the Converged Network Adapter (e.g. Emulex OCe14102-U 10Gb CNA - FCoE), and press <Enter> key.

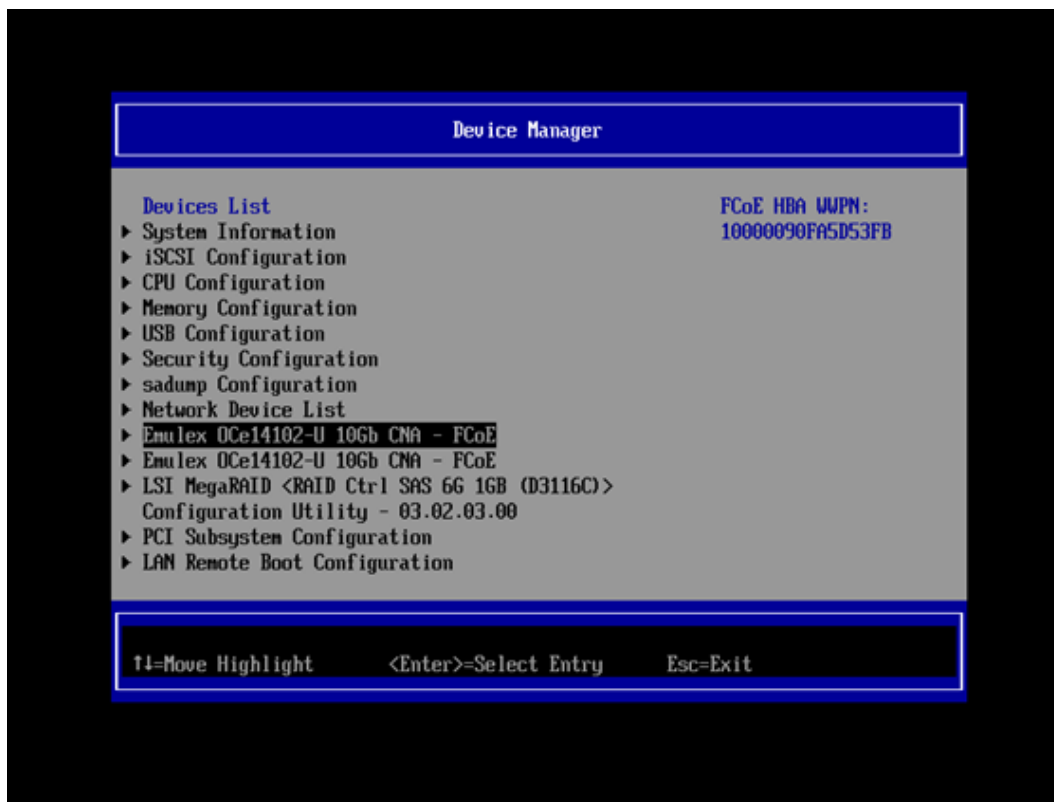


Figure 5-16

As shown in the figure below, move cursor onto the value of Set Boot from SAN, and press <Enter> key.



Figure 5-17

Select "Enable" from the pull-down menu, and press <Enter> key.



Figure 5-18

Make sure that the value of Set Boot from SAN has been changed to <Enable>.



Figure 5-19

### 5.3.1. Additional Settings of Boot Device

To check the disk array which are connected, select [Scan for Fibre Devices], and press <Enter> key.

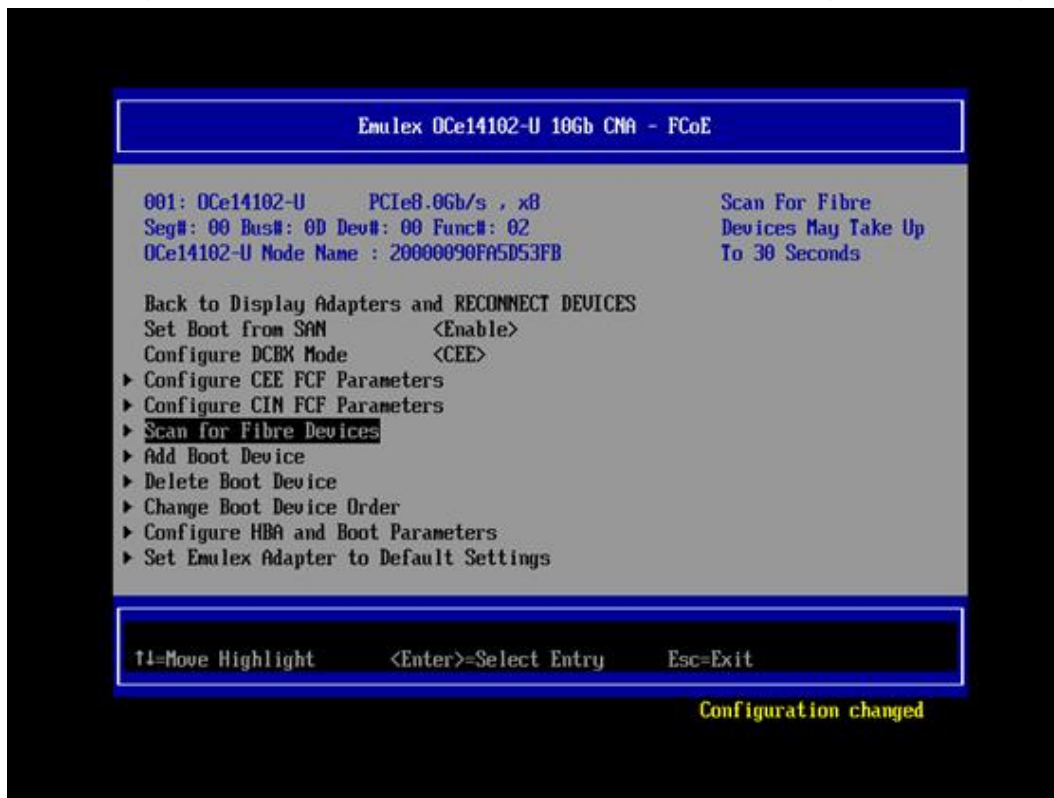


Figure 5-20

In SAN Discovery Target List, confirm the target boot device, move cursor onto [Go to Configuration Main Menu] and press <Enter> key to return to previous screen.

If you cannot find your target boot device in the list, check if converged fabric switch and FCoE storage are correctly set and the cables are correctly connected.



Figure 5-21

Move cursor onto [Add Boot Device] and press <Enter> key to make the setting of the Boot Device.

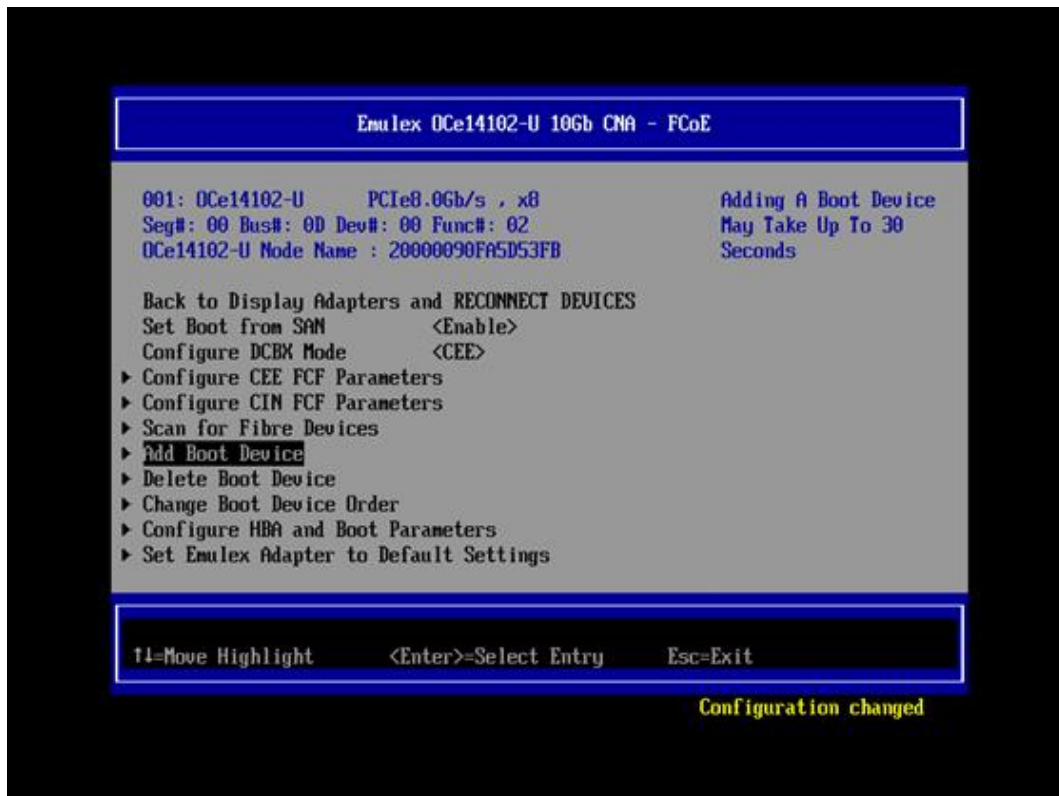


Figure 5-22

Select the target boot device as shown in the figure below, and press <Enter> key.

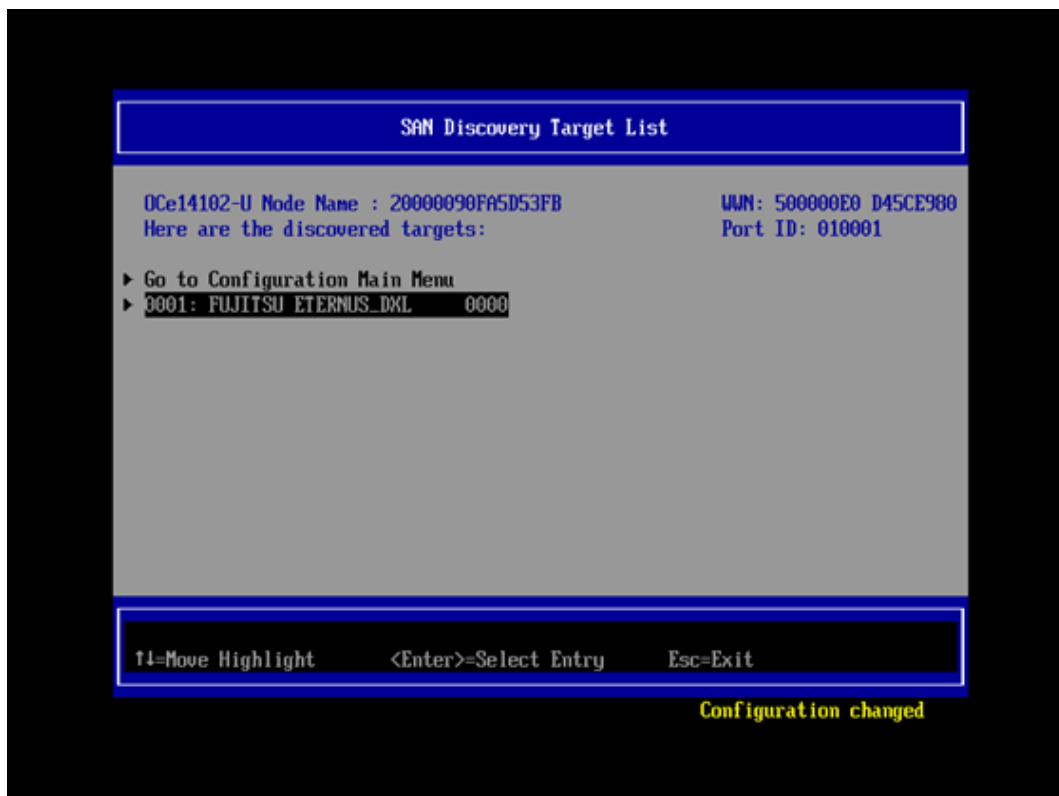


Figure 5-23

Since the LUNs of the target boot device are listed, select one to boot, and press <Enter> key.

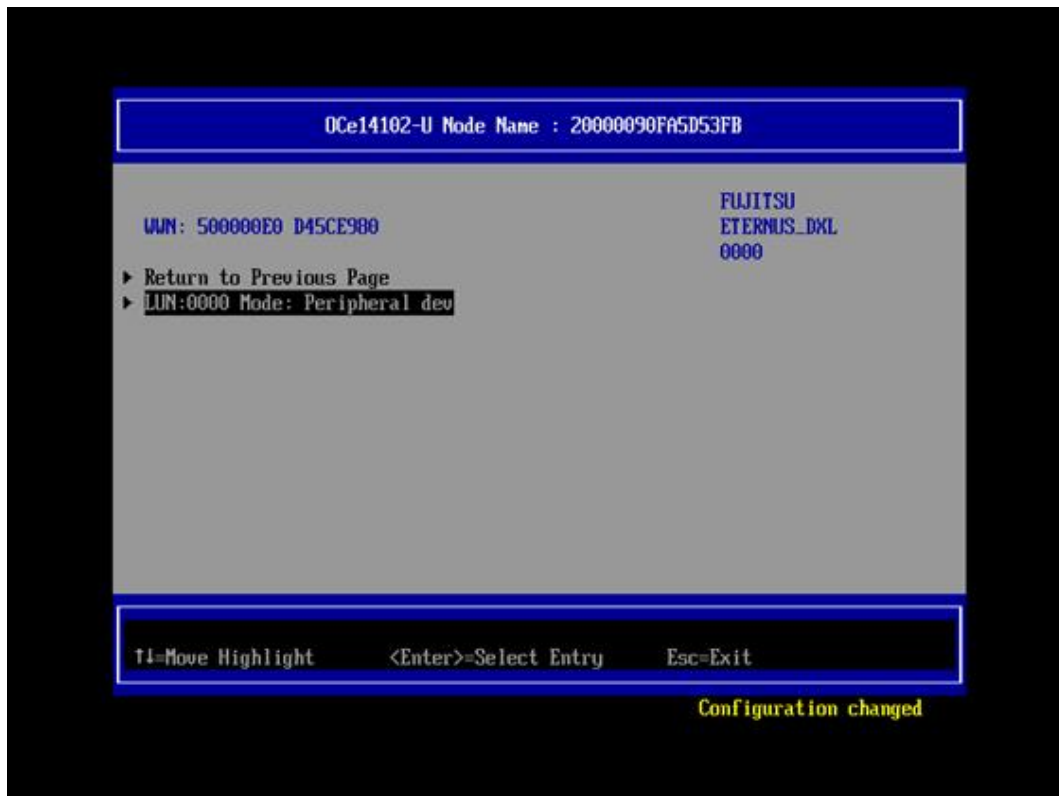


Figure 5-24

To save the settings, move cursor onto [Commit Change] and press <Enter> key.

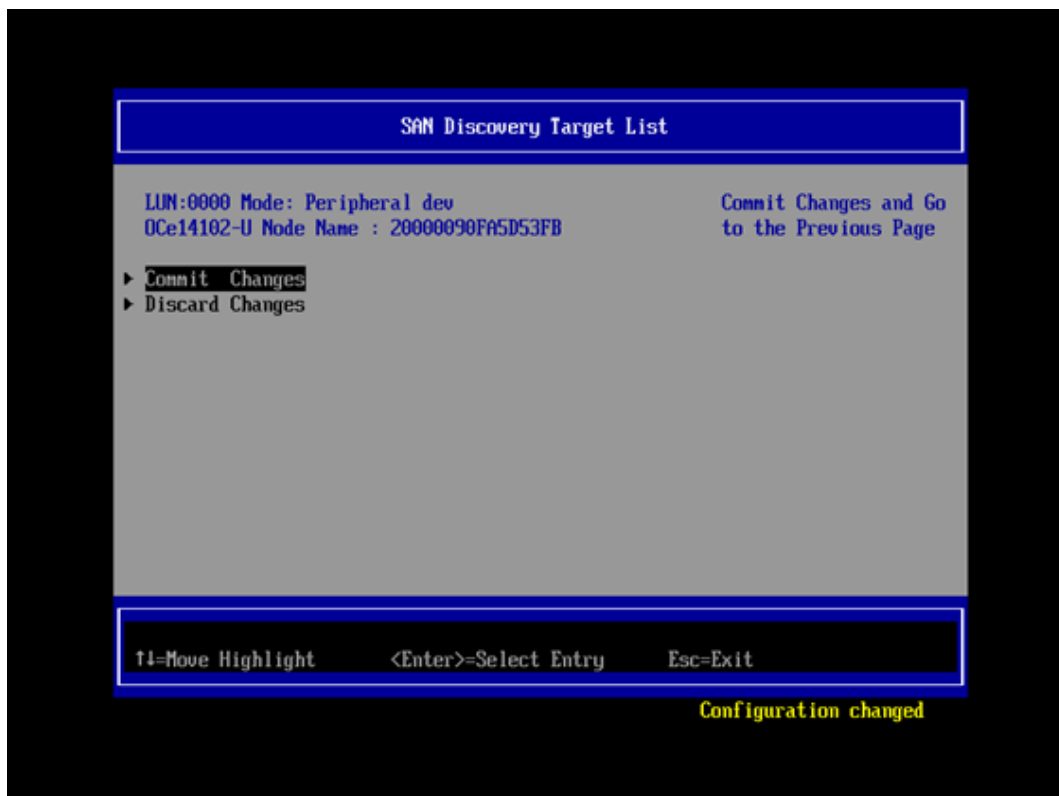


Figure 5-25

To exit the target converged network adapter screen (Emulex OCe14102-U 10Gb CNA - FCoE), press <Esc> key. If a message prompts to save the settings is displayed, press <Y> key to save the settings.

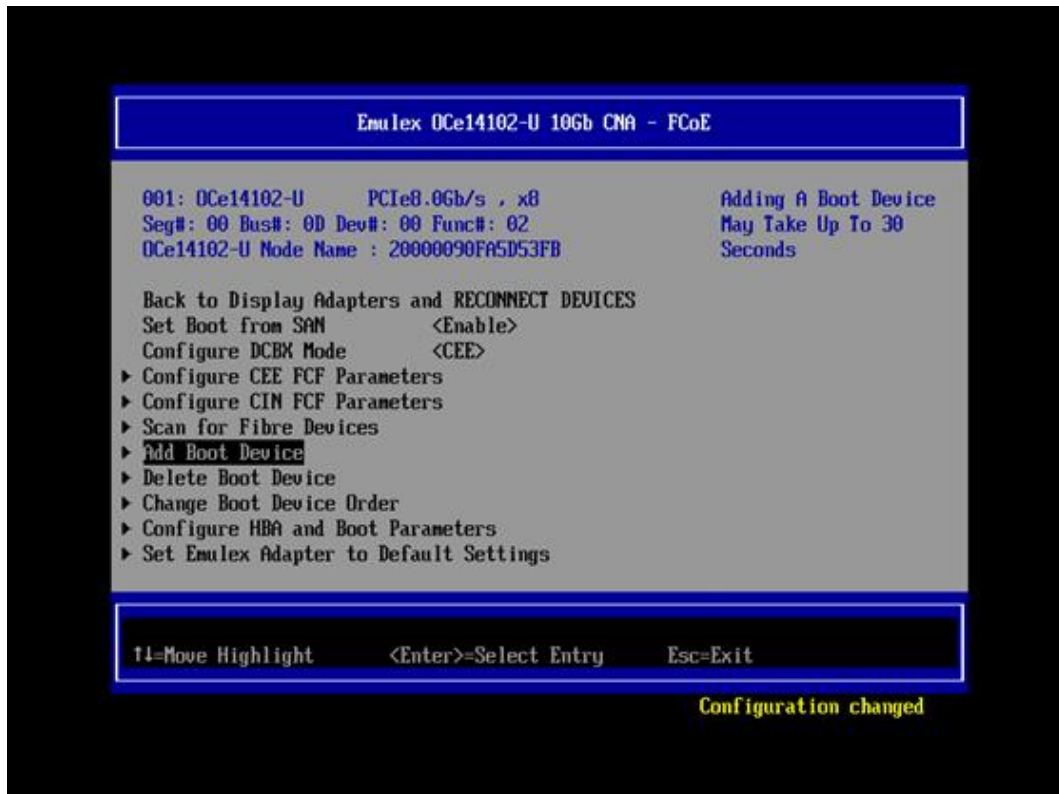


Figure 5-26

Press <Esc> key to exit Device Manager screen.



Figure 5-27

In UEFI main menu, select [Boot Maintenance Manager], and press <Enter> key.



Figure 5-27

In Boot Maintenance Manager screen, select [Reset System] and press <Enter> key to reboot the system.

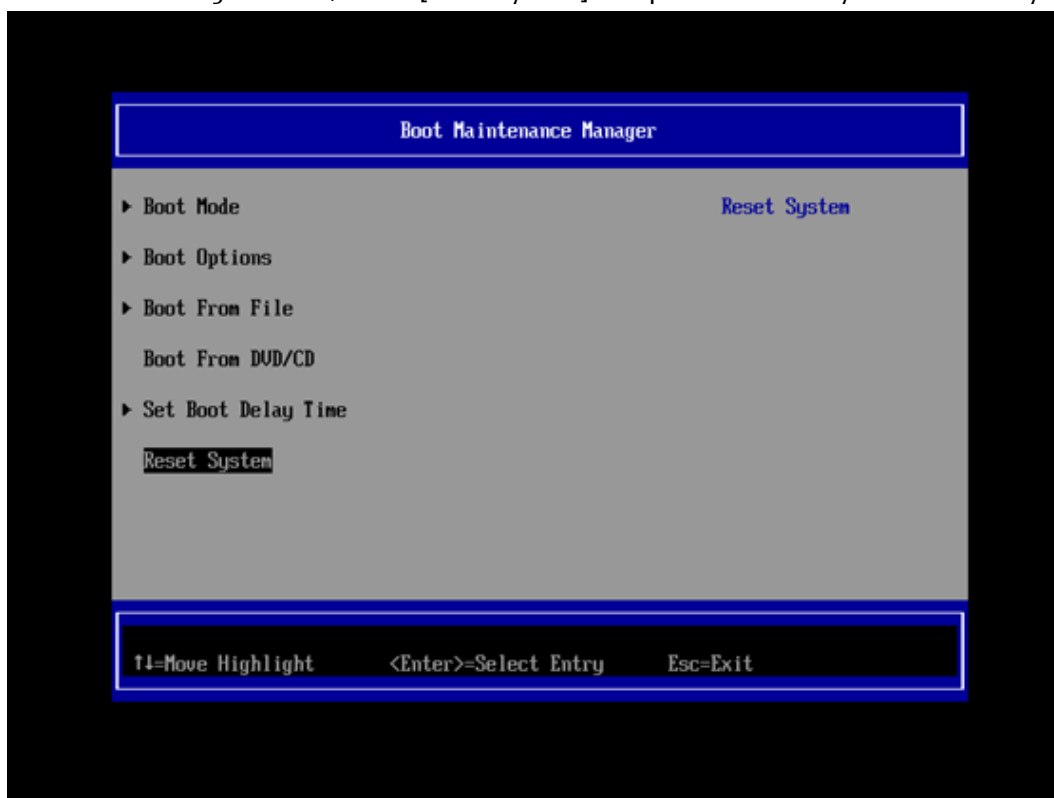


Figure 5-28

If you have done "Additional Settings of Boot Device", go to "OS Installing" in Chapter 6.



## 6. OS Installing

If the configurations of FCoE Boot that are described in previous chapters are properly done, a message notifies that the connection to the target storage is established is displayed as shown in the figure below.

### [Legacy BIOS]

During the server restarts up, WWPN and LUN of the target storage are displayed as shown in the figure below.

```
Emulex OneConnect FCoE BIOS, Version 10.2.343.0
Copyright (c) 1997-2014 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 2

Installing Emulex BIOS .....
Bringing the Link up, Please wait...
Link Up : Physical Link Established.
--Adapter 1 0Ce14102-U: S_ID:010102 PCI Bus, Device, Function (8C,00,02)
DID:010001 WWPN:500000E0D45CE980 LUN:00

Emulex BIOS is installed successfully!!!
```

Figure 6-1

### [UEFI]

In Boot Manager front page, select [Boot Manager] and press <Enter> key. Then select [EFI Internal Shell] and press <Enter> key to launch EFI shell.

If you see "blk0: BlockDevice" as shown in the figure below, the settings are completed.

```
EFI Shell version 2.31 [1.15]
Current running mode 1.1.2
Device mapping table
blk0 :BlockDevice - Alias (null)
PcieRoot (0x0) /Pci (0x2,0x0) /Pci (0x0,0x0) /Pci (0x8,0x0) /Pci (0x0,0x0) /Pci (0x
9,0x0) /Pci (0x0,0x0) /Pci (0x9,0x0) /Pci (0x0,0x0) /Fibre (0x500000E0D415DE25,0x0)

Press ESC in 2 seconds to skip startup.nsh, any other key to continue. _
```

Figure 6-2

Using SVIM (SeverView Install Manager), install OS of purpose.

## Note

If, in the shell screen, you cannot see the device you expect, the configuration of SAN or FCoE storage or FCoE switch, or the physical connection (cable, etc.), may not be correct. Check these points again.



### Important

#### Note about the connection to the storage device

Depending on storage device, there is a case that the settings of parameters of CNA driver are required.

For more information on the storage device, refer to the manual of the storage device.

For more information on the settings of connection to ETERNUS, refer to the manual of ETERNUS.

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PRIMEQUEST 2000 Series  
Converged Network Adapter  
FCoE Boot Configuration Manual  
CA92344-0966-01  
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Published by Fujitsu Limited

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