

Подготовка сервера для загрузки к СХД (FC SAN Boot)

Леонтьев Алексей
Системный инженер
E-Mail: aleontev@ocs.ru

tel. +7 (495) 995-2575 ext. 5556

tel. +7 (343) 379-4991 ext. 5556

The logo for Dell EMC, featuring the word "DELL" in blue with a stylized "E" and "EMC" in grey.

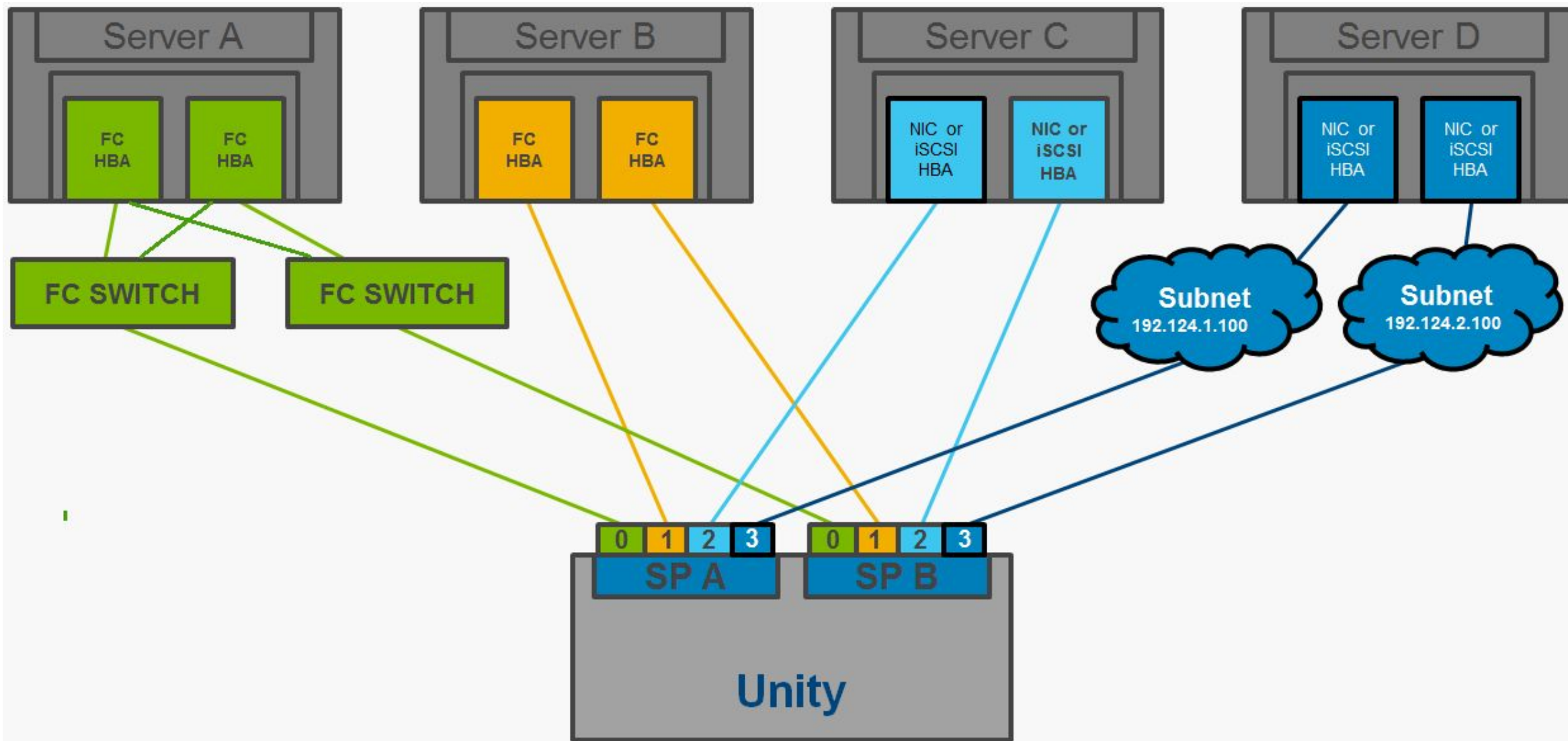
Екатеринбург, 27 сентября 2017

The logo for OCS DISTRIBUTION, featuring the letters "OCS" in grey with a stylized orange "O" and the word "DISTRIBUTION" in orange below it.

Конфигурирование сервера и СХД

Подготовка сервера для загрузки к СХД

к СХД



Подготовка сервера для загрузки к СХД

Загружаем сервер

Заходим в Bios HBA используя клавиши **CTRL+Q** или **ALT+Q** (Qlogic), **CTRL+E** или **ALT+E** (Emulex).

```
Proc 1: Quad-Core Intel(R) Xeon(TM) Processor (1.60 GHz/1066 MHz, 2x4MB L2)
Proc 2: Quad-Core Intel(R) Xeon(TM) Processor (1.60 GHz/1066 MHz, 2x4MB L2)
Power Regulator Mode: OS Control

Advanced Memory Protection Mode: Advanced ECC Support
Redundant ROM Detected - This system contains a valid backup system ROM.

Integrated Lights-Out 2 Advanced
iLO 2 v2.25 Apr 14 2014 10.10.10.24

QMh2462 PCI3.0 Fibre Channel ROM BIOS VERSION 3.12 Subsystem Vendor ID 103C
Copyright (C) QLogic Corporation 1993-2012. All rights reserved.
www.qlogic.com

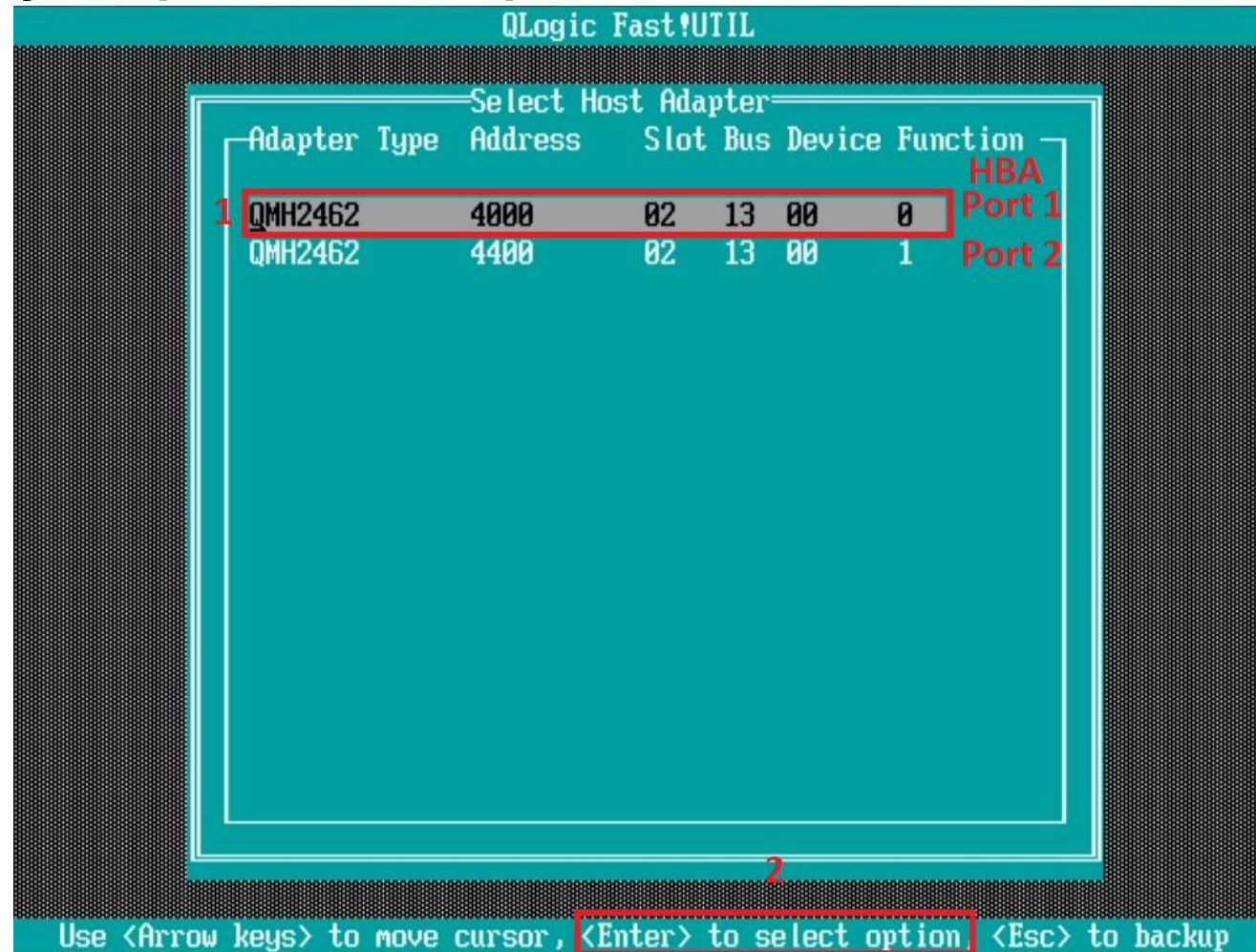
Press <CTRL-Q> or <ALT-Q> for Fast!UTIL ←
Firmware Version 5.03.15

<F9 = Setup>
Checking Adapter 0 Loop ID 02
<Alt-Q> Detected, Initialization in progress, Please wait... ←
Checking Adapter 1 Loop ID 02
```

Подготовка сервера для загрузки к СХД

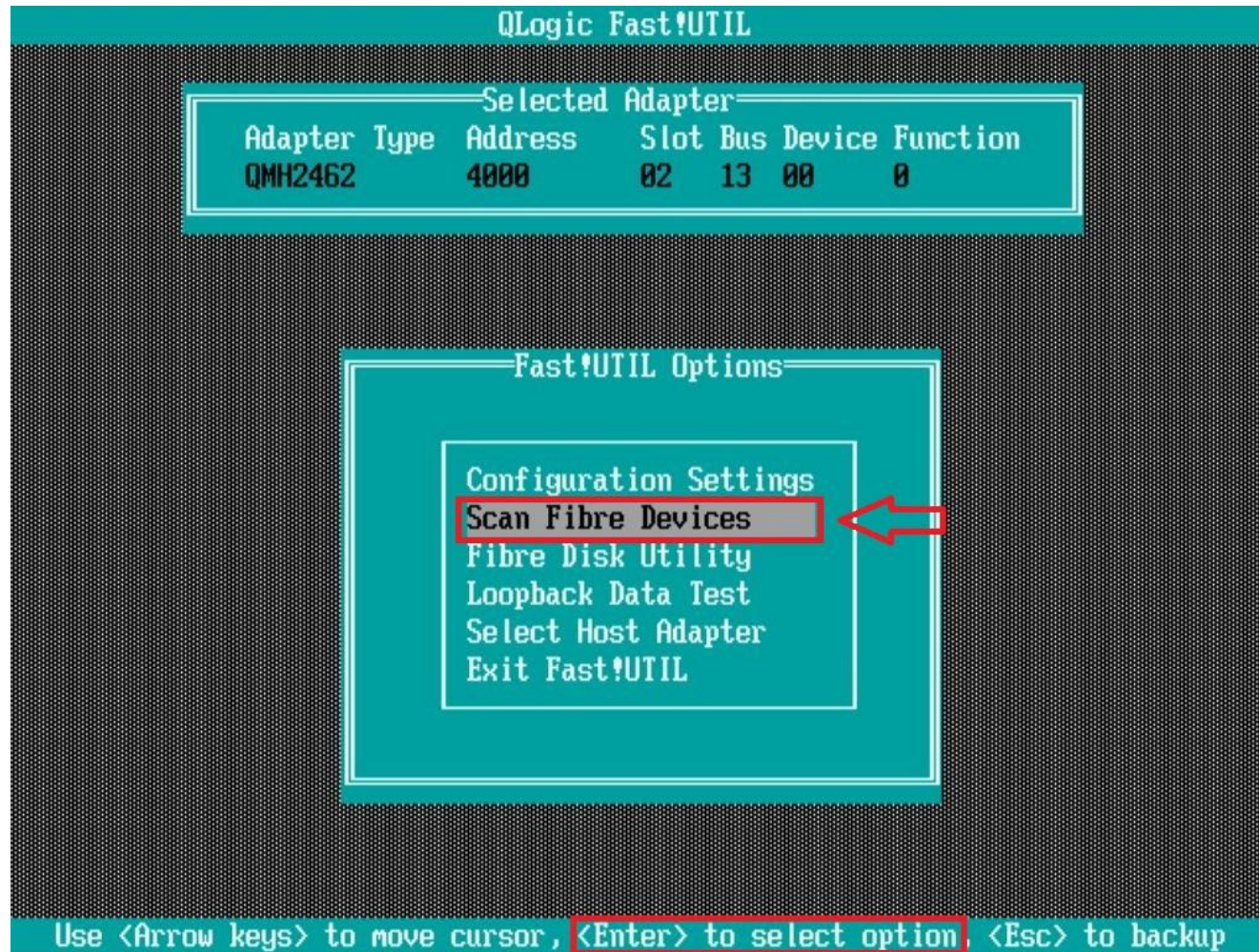
Выбор первого порта HBA

Каждый порт двух-портовой HBA представлен, как самостоятельное устройство.



Подготовка сервера для загрузки к СХД

Выполнение сканирования сети для обнаружения устройств



Подготовка сервера для загрузки к СХД

устройства

Port Name в данном случае показывает **wwn** – портов СХД

QLogic Fast!UTIL

Scan Fibre Channel Loop

| ID | Vendor | Product | Rev | Port Name | Port ID |
|----|-------------------|---------|------|------------------|---------|
| 0 | DGC | LUNZ | 4000 | 5006016247E01068 | 0B1400 |
| 1 | DGC | LUNZ | 4000 | 5006016A47E01068 | 0B1600 |
| 2 | No device present | | | | |
| 3 | No device present | | | | |
| 4 | No device present | | | | |
| 5 | No device present | | | | |
| 6 | No device present | | | | |
| 7 | No device present | | | | |
| 8 | No device present | | | | |
| 9 | No device present | | | | |
| 10 | No device present | | | | |
| 11 | No device present | | | | |
| 12 | No device present | | | | |
| 13 | No device present | | | | |
| 14 | No device present | | | | |
| 15 | No device present | | | | |

Вендор DGC
LUNZ
Port Name - это wwn портов СХД

Use <PageUp/PageDown> keys to display more devices, <ESC> to exit

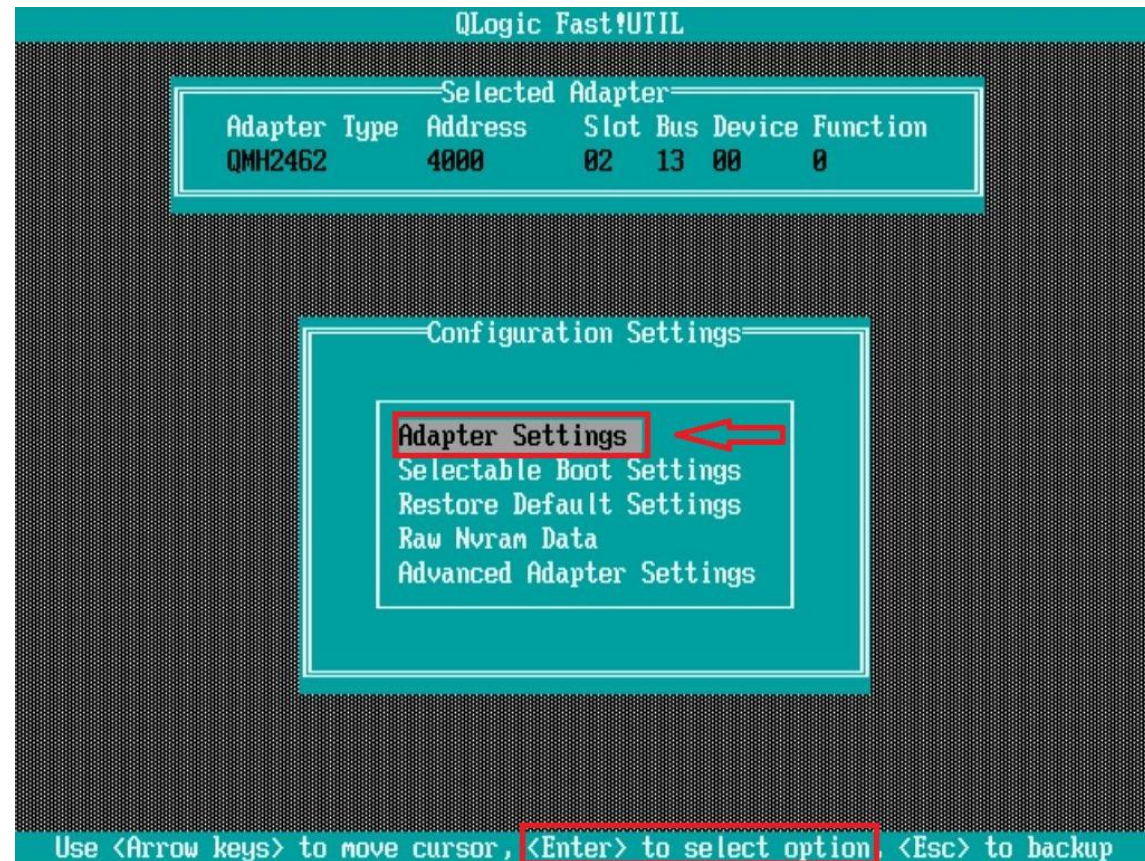
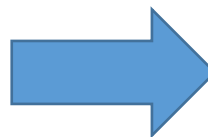
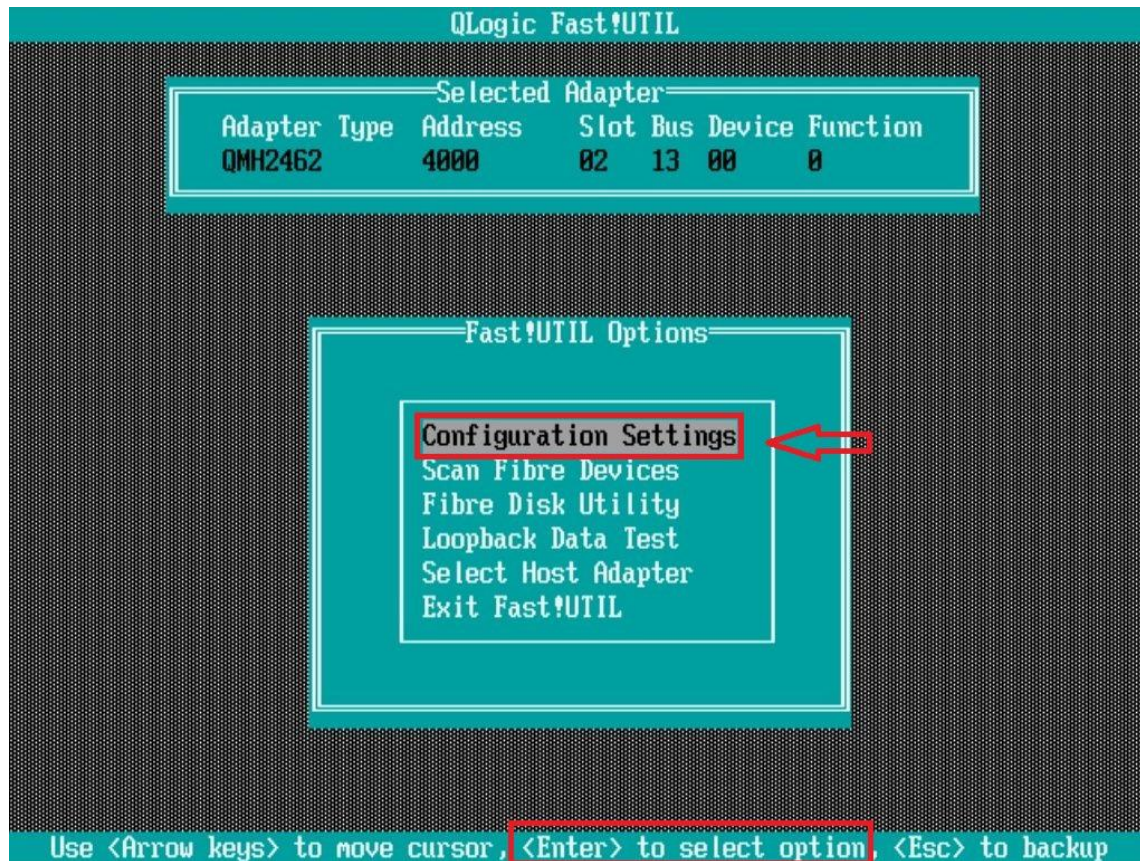
Подготовка сервера для загрузки к СХД

Unity

The screenshot displays the EMC Unisphere web interface. On the left, a navigation sidebar includes sections for DASHBOARD, SYSTEM (with 'System View' highlighted), STORAGE, ACCESS, DATA PROTECTION, and EVENTS. The main content area is titled 'Enclosures' and shows a dropdown menu for 'Enclosure: DPE 2'. Below this is a 3D perspective view of a server rack with a red box highlighting a specific port on the front panel, labeled with a red '4'. Above the rack view are view controls for 'Front', 'Rear', and 'Top', with 'Rear' selected and labeled with a red '3'. To the right, a detailed view of 'SP B FC Port 4' is shown, indicating it is 'OK' and 'operating normally'. The port's WWN is listed as '60:06:01:60:C7:E0:10:68' and '60:06:01:6A:47:E0:10:68', with a red arrow pointing to the second WWN value, which is also enclosed in a red box.

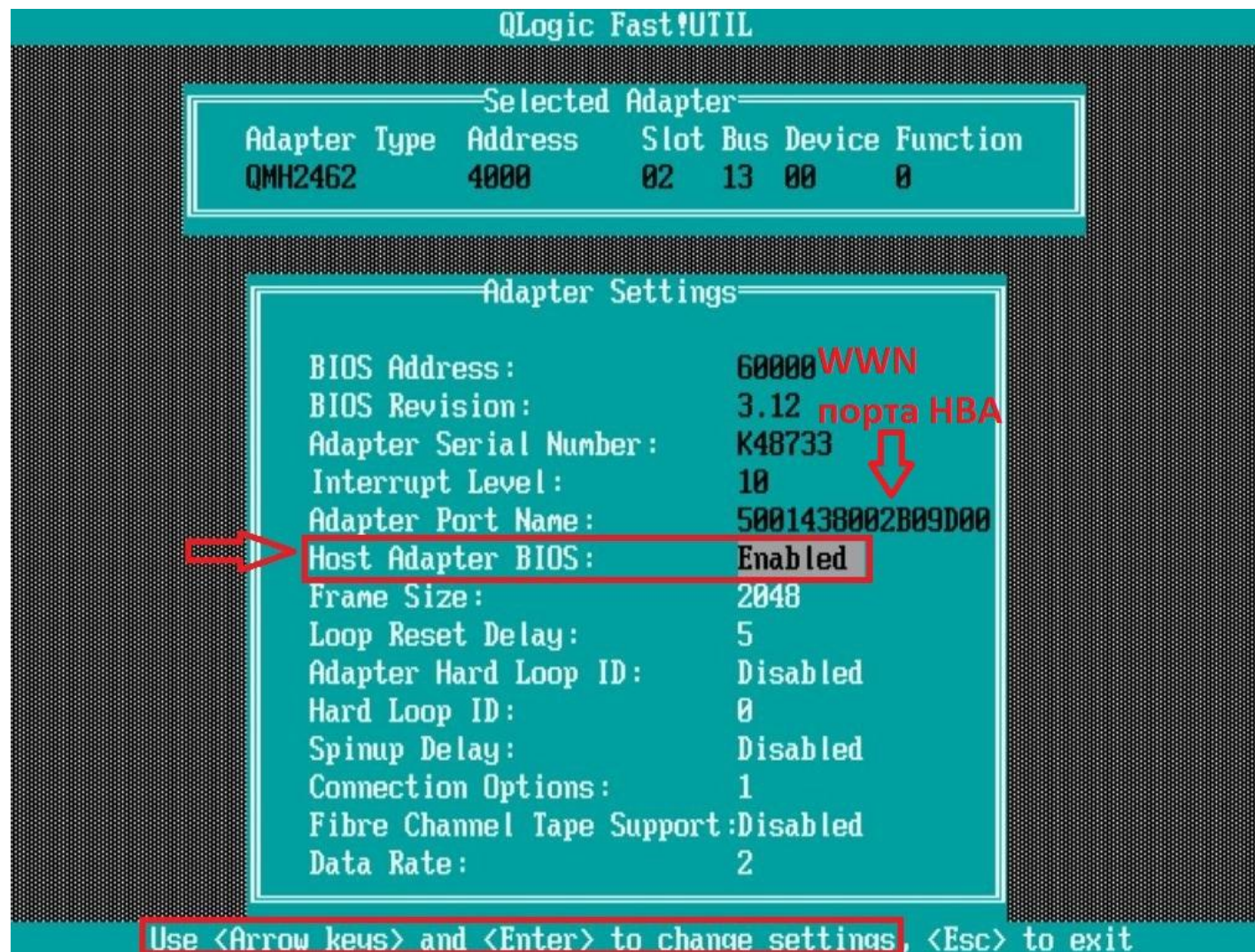
Подготовка сервера для загрузки к СХД

конфигурированию НВА



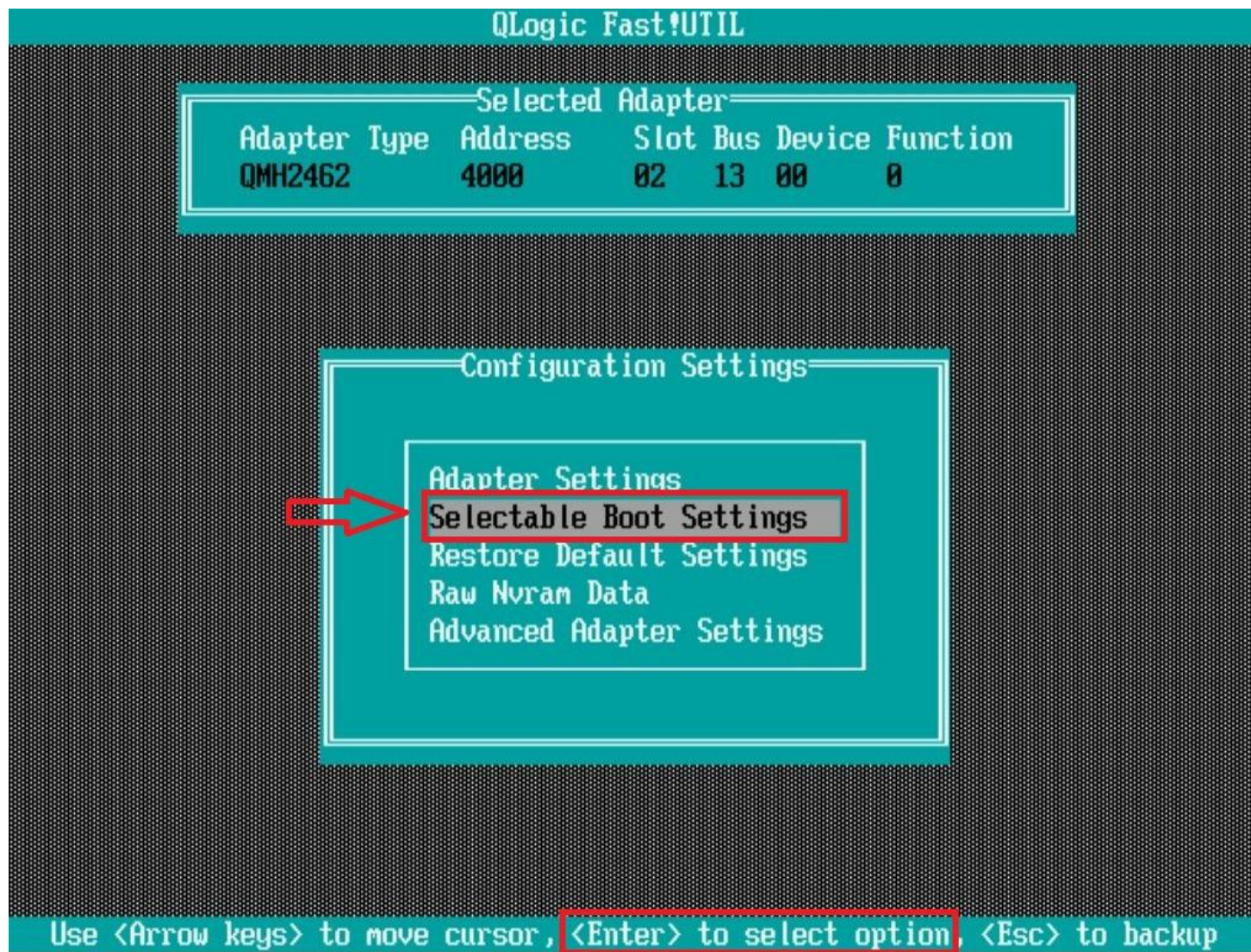
Подготовка сервера для загрузки к СХД

BIOS



Подготовка сервера для загрузки к СХД

Settings»



Подготовка сервера для загрузки к СХД

устройства

QLogic Fast!UTIL

Selected Adapter

| Adapter Type | Address | Slot | Bus | Device | Function |
|--------------|---------|------|-----|--------|----------|
| QMH2462 | 4000 | 02 | 13 | 00 | 0 |

Selectable Boot Settings

| | | |
|-------------------------------|-----------------------|---|
| Selectable Boot: | Enabled | 1 |
| (Primary) Boot Port Name,Lun: | 0000000000000000, 0 | |
| Boot Port Name,Lun: | 2 0000000000000000, 0 | |
| Boot Port Name,Lun: | 0000000000000000, 0 | |
| Boot Port Name,Lun: | 0000000000000000, 0 | |

Press "C" to clear a Boot Port Name entry

Use <Arrow keys> and <Enter> to change settings, <Esc> to exit

Подготовка сервера для загрузки к СХД

устройства

QLogic Fast!UTIL

Select Fibre Channel Device

| ID | Vendor | Product | Rev | Port Name | Port ID |
|----|-------------------|---------|------|------------------|---------|
| 0 | DGC | LUNZ | 4000 | 5006016247E01068 | 0B1400 |
| 1 | DGC | LUNZ | 4000 | 5006016A47E01068 | 0B1600 |
| 2 | No device present | | | | |
| 3 | No device present | | | | |
| 4 | No device present | | | | |
| 5 | No device present | | | | |
| 6 | No device present | | | | |
| 7 | No device present | | | | |
| 8 | No device present | | | | |
| 9 | No device present | | | | |
| 10 | No device present | | | | |
| 11 | No device present | | | | |
| 12 | No device present | | | | |
| 13 | No device present | | | | |
| 14 | No device present | | | | |
| 15 | No device present | | | | |

Use <PageUp/PageDown> keys to display more devices

Use <Arrow keys> to move cursor, <Enter> to select option, <Esc> to backup

↑
Исторически сложилось, что midrange массивы EMC видны как устройства компании DGC (Data General Company)



QLogic Fast!UTIL

Selected Adapter

| Adapter | Type | Address | Slot | Bus | Device | Function |
|---------|------|---------|------|-----|--------|----------|
| QM2462 | | 4000 | 02 | 13 | 00 | 0 |

Selectable Boot Settings

Selectable Boot : Enabled

(Primary) Boot Port Name,Lun : 5006016247E01068, 0

Boot Port Name,Lun : 5006016A47E01068, 0

Boot Port Name,Lun : 0000000000000000, 0

Boot Port Name,Lun : 0000000000000000, 0

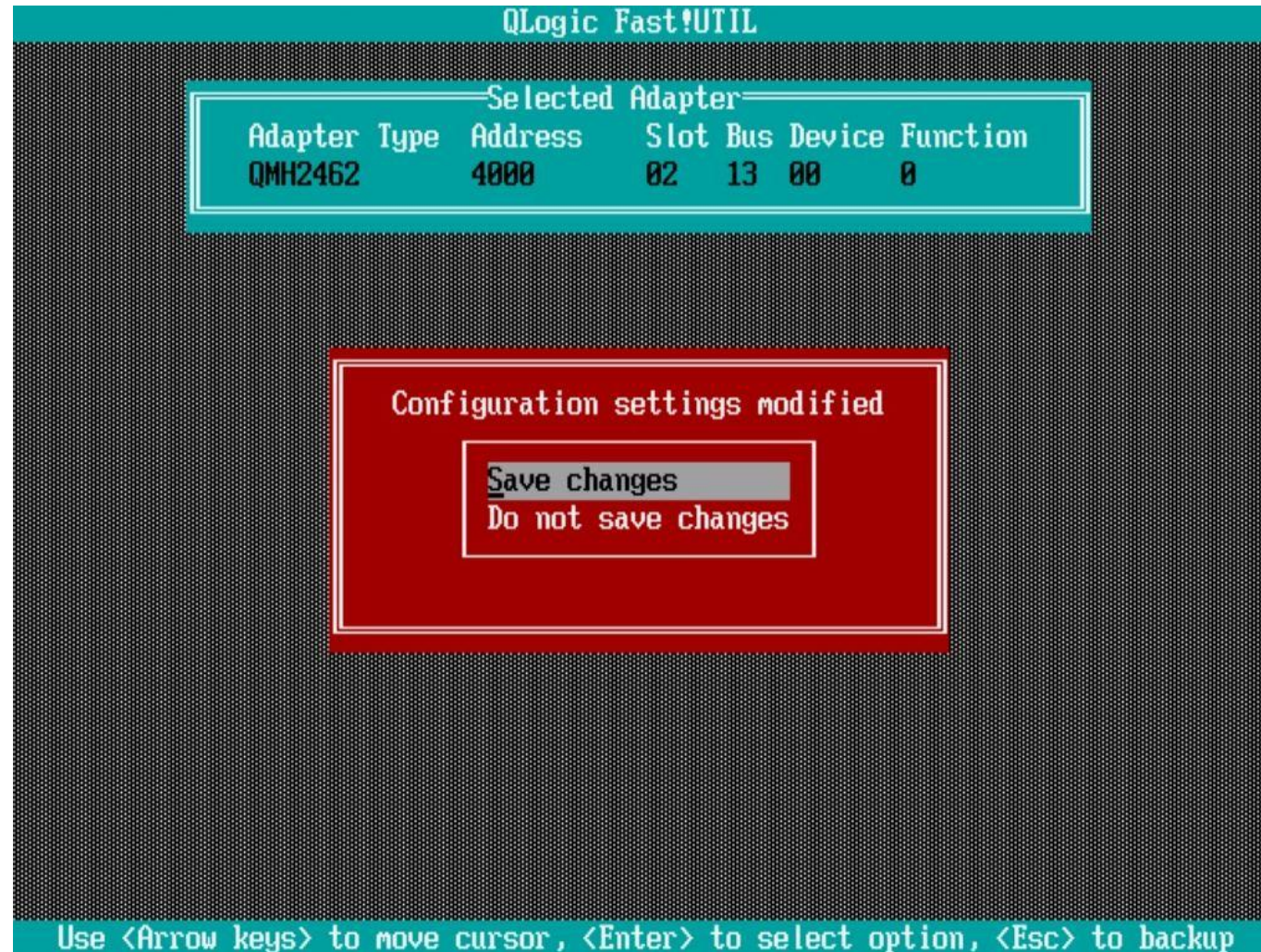
Press "C" to clear a Boot Port Name entry

Use <Arrow keys> and <Enter> to change settings, <Esc> to exit

Подготовка сервера для загрузки к СХД

порта

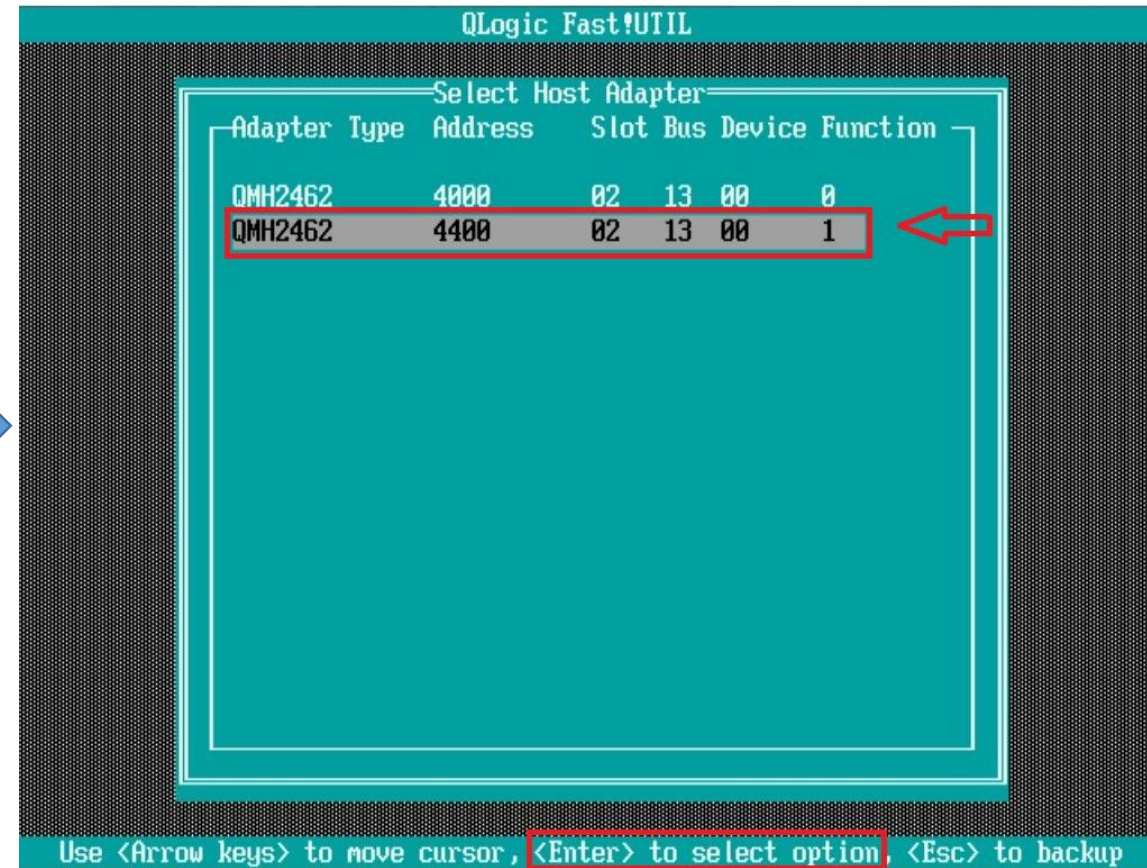
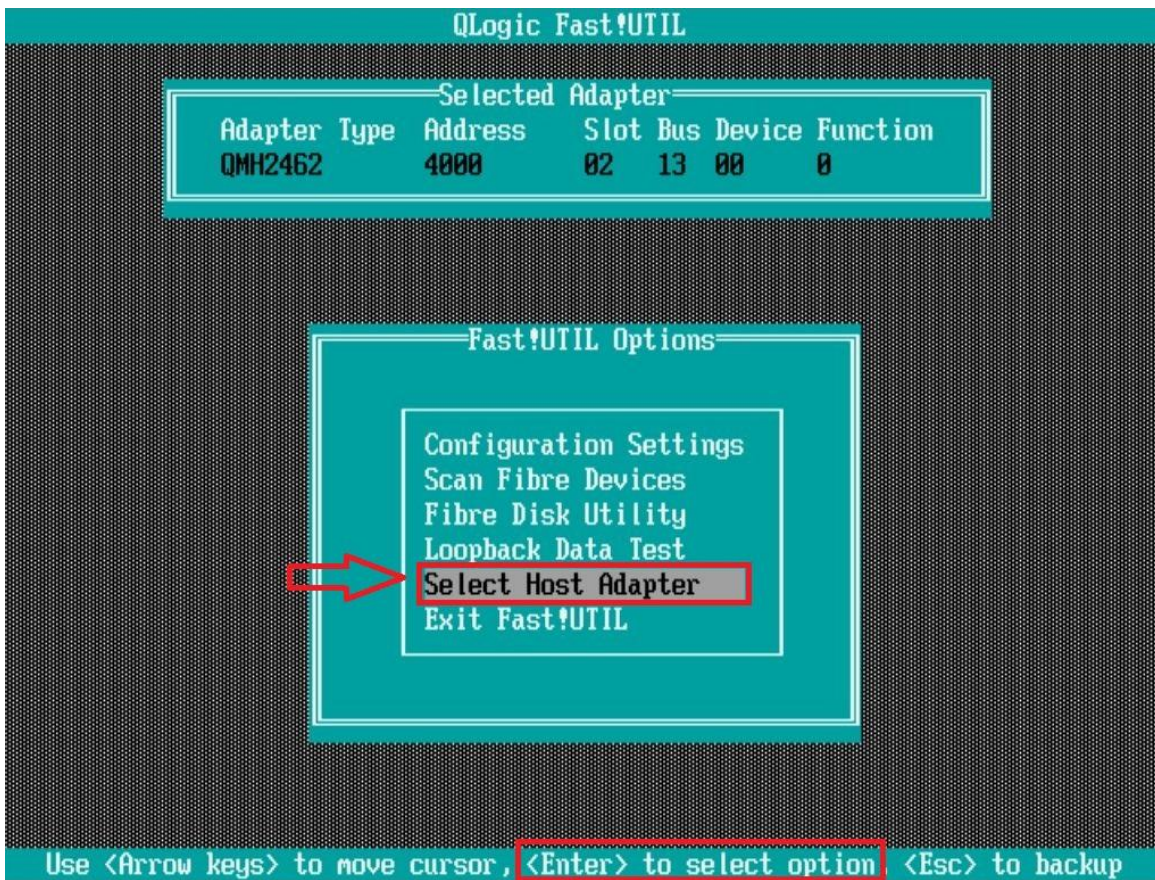
Используем клавишу **ESC** и сохраняем настройки



Подготовка сервера для загрузки к СХД

HBA

Настраиваем аналогично первому порту!!!



Подготовка сервера для загрузки к СХД

СХД

The screenshot shows the EMC Unisphere web interface. The left sidebar contains navigation menus for DASHBOARD, SYSTEM, STORAGE, ACCESS, DATA PROTECTION, EVENTS, and SUPPORT. The 'Initiators' menu item is highlighted with a red box. The main content area displays a table of initiators under the 'Initiators' tab. The table has columns for status, Initiator IQN/WWN, Host, Host Name, Protocol, Ignore, and checkboxes for i, E, and C. Two rows are highlighted with a red box: the row with Initiator IQN/WWN 60:01:43:80:02:AE:DD:0B:60:01:43:80:02:AE:DD:0A and the row with 60:01:43:80:02:AE:DD:09:60:01:43:80:02:AE:DD:08. Both rows show a yellow warning icon, a host of '--', and a protocol of FC.

| | ! | Initiator IQN/WWN | ↑ Host | Ho... | Protocol | Ignore | i | E | C |
|--------------------------|---|---|------------|-------|----------|--------|---|---|---|
| <input type="checkbox"/> | ✓ | 60:01:43:80:00:AC:8C:B9:60:01:43:80:00:AC:8C:B8 | Blade2.EMC | A... | FC | No | | | |
| <input type="checkbox"/> | ✓ | 60:01:43:80:00:AC:8C:BB:60:01:43:80:00:AC:8C:BA | Blade2.EMC | A... | FC | No | | | |
| <input type="checkbox"/> | ⚠ | 60:01:43:80:00:C0:68:71:60:01:43:80:00:C0:68:70 | Blade6 | ... | FC | No | | | |
| <input type="checkbox"/> | ⚠ | 60:01:43:80:00:C0:68:71:60:01:43:80:00:C0:68:72 | Blade6 | ... | FC | No | | | |
| <input type="checkbox"/> | ⚠ | 60:01:43:80:02:22:E5:01:60:01:43:80:02:22:E5:00 | Blade5 | ... | FC | No | | | |
| <input type="checkbox"/> | ⚠ | 60:01:43:80:02:22:E5:03:60:01:43:80:02:22:E5:02 | Blade5 | ... | FC | No | | | |
| <input type="checkbox"/> | ⚠ | 60:01:43:80:02:AE:DD:0B:60:01:43:80:02:AE:DD:0A | -- | -- | FC | No | | | |
| <input type="checkbox"/> | ⚠ | 60:01:43:80:02:AE:DD:09:60:01:43:80:02:AE:DD:08 | -- | -- | FC | No | | | |
| <input type="checkbox"/> | ⚠ | 60:01:43:80:02:B0:9D:01:60:01:43:80:02:B0:9D:00 | Blade4 | ... | FC | No | | | |
| <input type="checkbox"/> | ⚠ | 60:01:43:80:02:B0:9D:03:60:01:43:80:02:B0:9D:02 | Blade4 | ... | FC | No | | | |
| <input type="checkbox"/> | ✓ | 60:01:43:80:03:BC:51:95:60:01:43:80:03:BC:51:94 | Blade1.EMC | A... | FC | No | | | |
| <input type="checkbox"/> | ✓ | 60:01:43:80:03:BC:51:97:60:01:43:80:03:BC:51:96 | Blade1.EMC | A... | FC | No | | | |
| <input type="checkbox"/> | ⚠ | iqn.1990-07.com.emulex:44-1e-a1-43-45-49 | Blade1.EMC | A... | iSCSI | Yes | | F | Y |
| <input type="checkbox"/> | ⚠ | iqn.1991-05.com.microsoft.blade2 | Blade2.EMC | A... | iSCSI | Yes | | F | Y |

Подготовка сервера для загрузки к СХД

СХД

EMC² Unisphere

DASHBOARD

SYSTEM

STORAGE

ACCESS

DATA PROT

EVENTS

SUPPORT

Hosts

Host

Subnet

3 items

BLADE4

Status: Degraded

The host does not

Add a Host

Select Fibre Channel Initiators

Auto-Discovered Initiators

| Initiator WWN | Connected To |
|---|--------------------------------|
| <input checked="" type="checkbox"/> 60:01:43:80:02:AE:DD:0B:60:01:43:80:02:AE:DD:0A | SP A FC Port 5, SP B FC Port 5 |
| <input checked="" type="checkbox"/> 60:01:43:80:02:AE:DD:09:60:01:43:80:02:AE:DD:08 | SP A FC Port 4, SP B FC Port 4 |

Manually Created Initiators

WWN

Create Initiator

From the list of auto-discovered initiators, select the FC initiators the host will use to access storage resources. If you do not find the initiator you want in the list, click Create Initiator to manually add an initiator, and then select it from the list of manually added initiators.

Cancel Back Next

Подготовка сервера для загрузки к СХД

Создаем загрузочный LUN

EMC² Unisphere

LUNs Consistency Groups iSCSI Interfaces

1 **2** **3** **4** **5**

Configure Storage Characteristics

Pool: Pool1

Tiering Policy: Start High Then Auto-Tier

Size: 100 GB

Thin: Yes

Host I/O Limit: No Limit

Cancel Back **Next**

Подготовка сервера для загрузки к СХД

Даем серверу доступ к созданному LUN

Create a LUN

✓ Name
✓ Storage
• **Access** 1
Snapshot
Replication
Summary
Results

Configure Access

2 + ! Name

Select Host Access

Access Type: LUN 3

Hosts:

More Actions - Filtered down to 6 items

| | ! | Name | Operating System | Protocols |
|-------------------------------------|---|------------|-------------------|-----------------|
| <input type="checkbox"/> | ✓ | Blade1.EMC | VMware ESXi 5.5.0 | iSCSI, FC, File |
| <input type="checkbox"/> | ✓ | Blade2.EMC | VMware ESXi 5.5.0 | iSCSI, FC, File |
| <input checked="" type="checkbox"/> | ✓ | Blade3 | Windows Server | FC, File |
| <input type="checkbox"/> | ! | Blade4 | Windows Server | FC, File |
| <input type="checkbox"/> | ! | Blade5 | Windows Server | FC, File |

4

5

Cancel OK

6

Cancel Back Next

Select the hosts that can access the storage resource.
For block-based storage, you can configure each host to access the storage resource, snapshots of the storage resource, or both.

Подготовка сервера для загрузки к СХД

сервере

EMC² Unisphere

Hosts

4 items

| ! | Name | Network Addre... | Operating Syst... | Type | LUNs | Initiators | Initiator Paths |
|-------------------------------------|--------|------------------|-------------------|--------|------|------------|-----------------|
| <input checked="" type="checkbox"/> | Blade3 | 10.10.10.43 | Windows Server | Manual | 1 | 2 | 4 |
| <input type="checkbox"/> | Blade | | | | | | |
| <input type="checkbox"/> | Blade | | | | | | |
| <input type="checkbox"/> | Blade | | | | | | |

Blade3 Properties

General LUNs Network Addresses Initiators Initiator Paths

Modify LUN IDs

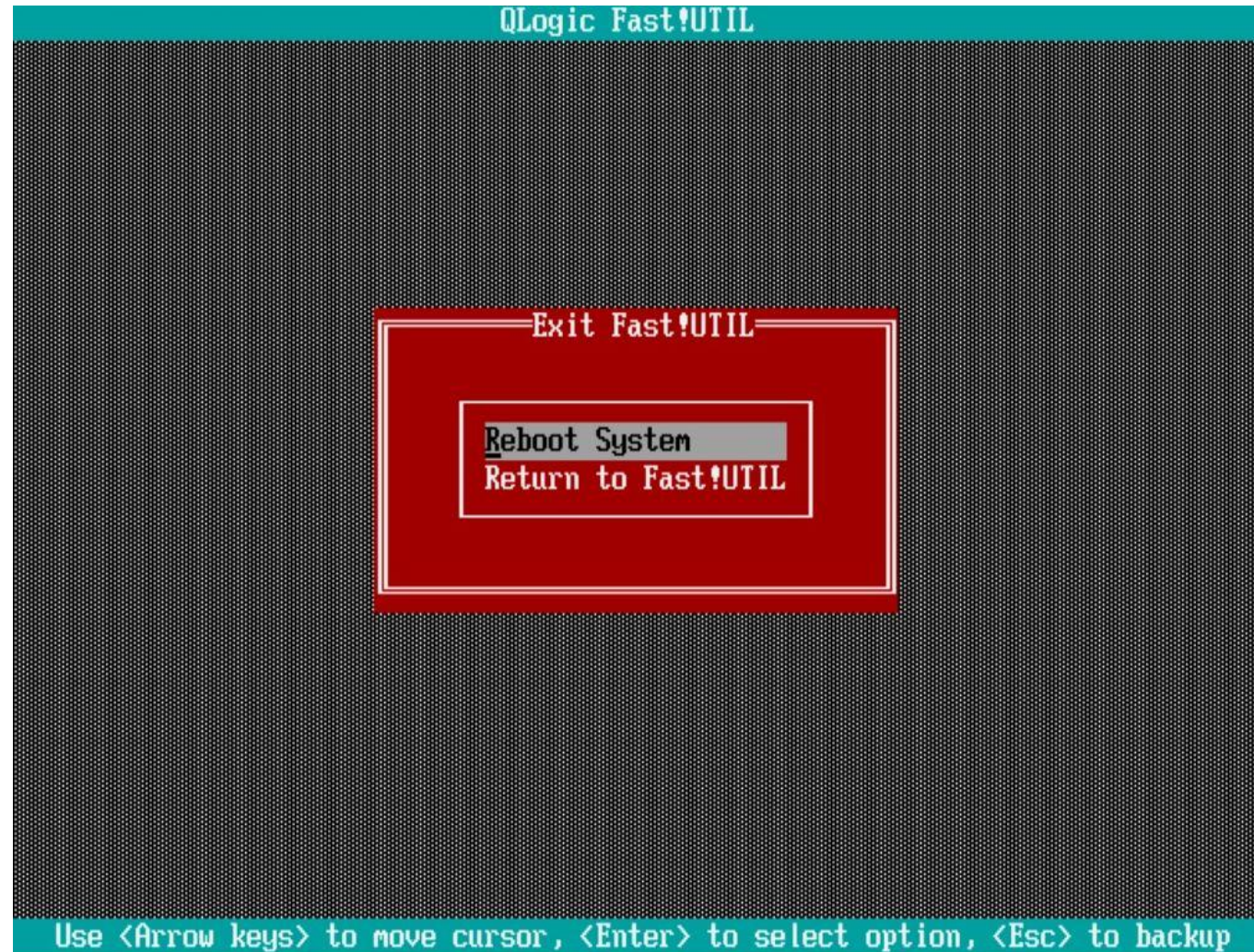
| ! | Storage Resource | Name | Att... | Size (GB) | LUN ID | WWN | Pool |
|-------------------------------------|------------------|----------|--------|-----------|--------|----------------------|-------|
| <input checked="" type="checkbox"/> | Boot-Lun | Boot-Lun | | 100.0 | 0 | 60:06:01:60:E1:30... | Pool1 |

Close

Подготовка сервера для загрузки к СХД

настройки НВА

Используем клавишу **ESC** и подтверждаем перезагрузку



Подготовка сервера для загрузки к СХД

сервера

Проверяем, что порты HBA указаны как первичные загрузочные HDD

ROM-Based Setup Utility, Version 2.10
Copyright 1982, 2011 Hewlett-Packard Development Company, L.P.

System Options
PCI Devices
Standard Boot Order (IPL)
Boot Controller Order
Date and Time
Server Availability
Server Passwords
BIOS Serial Console & EMS
Server Asset Text
Advanced Options
Utility Language



HP ProLiant ROM-Based Setup
S/N: GB879
Product ID
HP BIOS I1
Backup Ver
Bootblock
13312MB M
Proc 1:Int
Proc 2:Int
MAC address
iSCSI
MAC address
iSCSI

IPL:1 CD-ROM
IPL:2 Hard Drive C: (See Boot Controller Order)
IPL:3 USB DriveKey (C:)
IPL:4 Floppy Drive (A:)



ROM-Based Setup
Copyright 1982, 2011 Hewlett-Packard Development Company, L.P.

Ctrl:1 PCI Slot 2 QLogic QMH2462 4Gb FC HBA Port 1
Ctrl:2 PCI Slot 2 QLogic QMH2462 4Gb FC HBA Port 2
Ctrl:3 PCI Embedded HP Smart Array E200i Controller



<Enter> to View/Modify System Specific Options
<↑/↓> for Different Selection; <ESC> to Exit Utility

<Enter> to Select IPL Device; <F1> for Help
<↑/↓> for Different IPL Device; <ESC> to Close Menu

<Enter> to Select Mass Storage Controller
<↑/↓> for Different Mass Storage Controller; <ESC> to Close Menu; <F1> for Help

Сохраняем настройки и перезагружаемся

Подготовка сервера для загрузки к СХД

сервера

При загрузке сервера должно быть видно загрузочное устройство как на скриншоте

```
QMh2462 PCI3.0 Fibre Channel ROM BIOS Version 3.29 Subsystem Vendor ID 103C
Copyright (C) QLogic Corporation 1993-2015. All rights reserved.
www.qlogic.com

Press <CTRL-Q> or <ALT-Q> for Fast!UTIL
Firmware Version 8.01.02

                                                                    <F9 = Setup>
Device Device Adapter Port Lun Vendor Product Product
Number Type Number ID Number ID ID Revision
      Disk      0      0B1400 0      DGC  VRAID  4000
ROM BIOS Installed
```

Подготовка сервера для загрузки к СХД

Спасибо за внимание!

Подготовка сервера для загрузки к СХД

