
Deploying Operating System on iSCSI & FCOE LUN

This Dell Technical White Paper provides steps to explain the deployment of OS on iSCSI & FCoE LUN on the 12th generation servers of Dell.

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Executive Summary

This whitepaper gives the basics of Operating system deployment to an iSCSI LUN & FCoE LUN on the 12th generation servers of Dell.

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Introduction

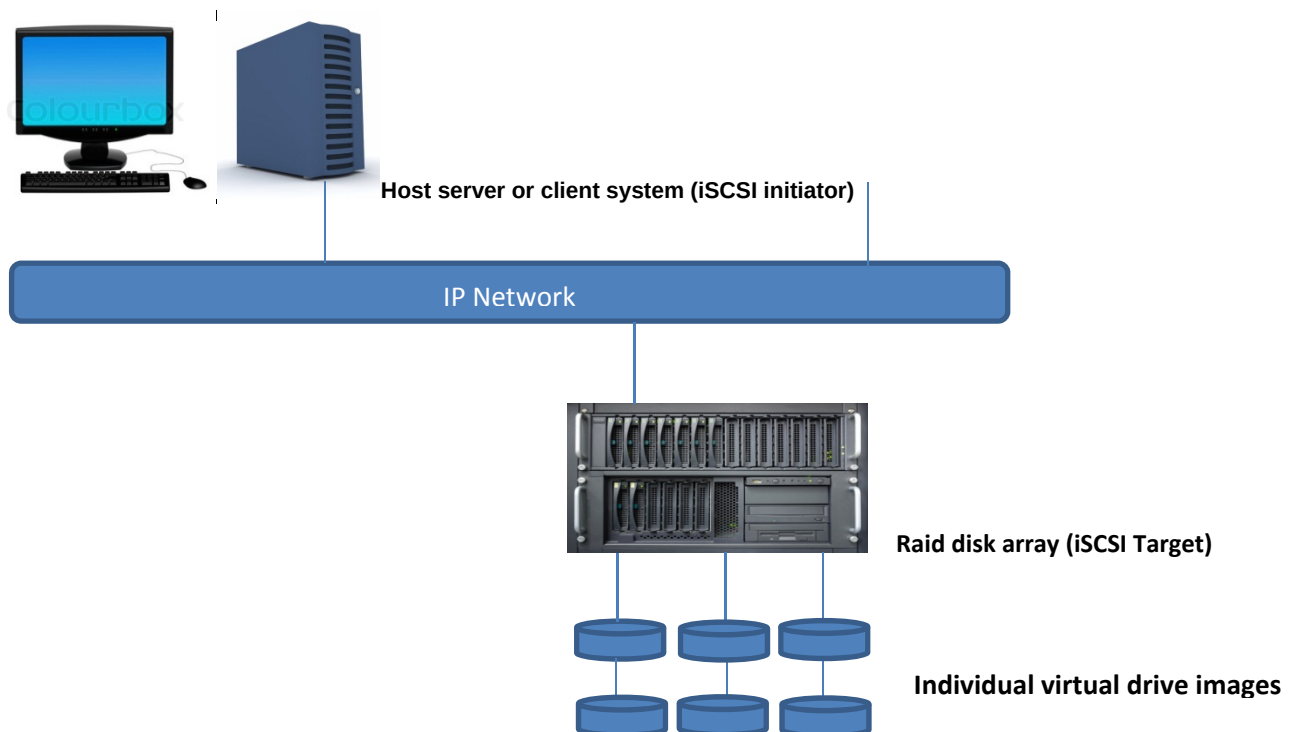
This whitepaper describes installing, enabling, and configuring for Internet Small Computer System Interface (iSCSI), and Fibre Channel over Ethernet (FCoE) for universal converged network adapters (UCNAs).

Boot from SAN is the process of booting a server directly from a disk operating system (DOS) image located on a storage area network (SAN). When booting from SAN, the storage device is typically identified by its World Wide Port Name (WWPN) and a Logical Unit Number (LUN). By extending the server system boot basic input/output system (BIOS), boot from SAN functionality is provided by the boot BIOS contained in the Dell server. When properly configured, the controller then permanently directs the server to boot from a logical unit (physical disk drive) on the SAN as if it was a local physical disk drive.

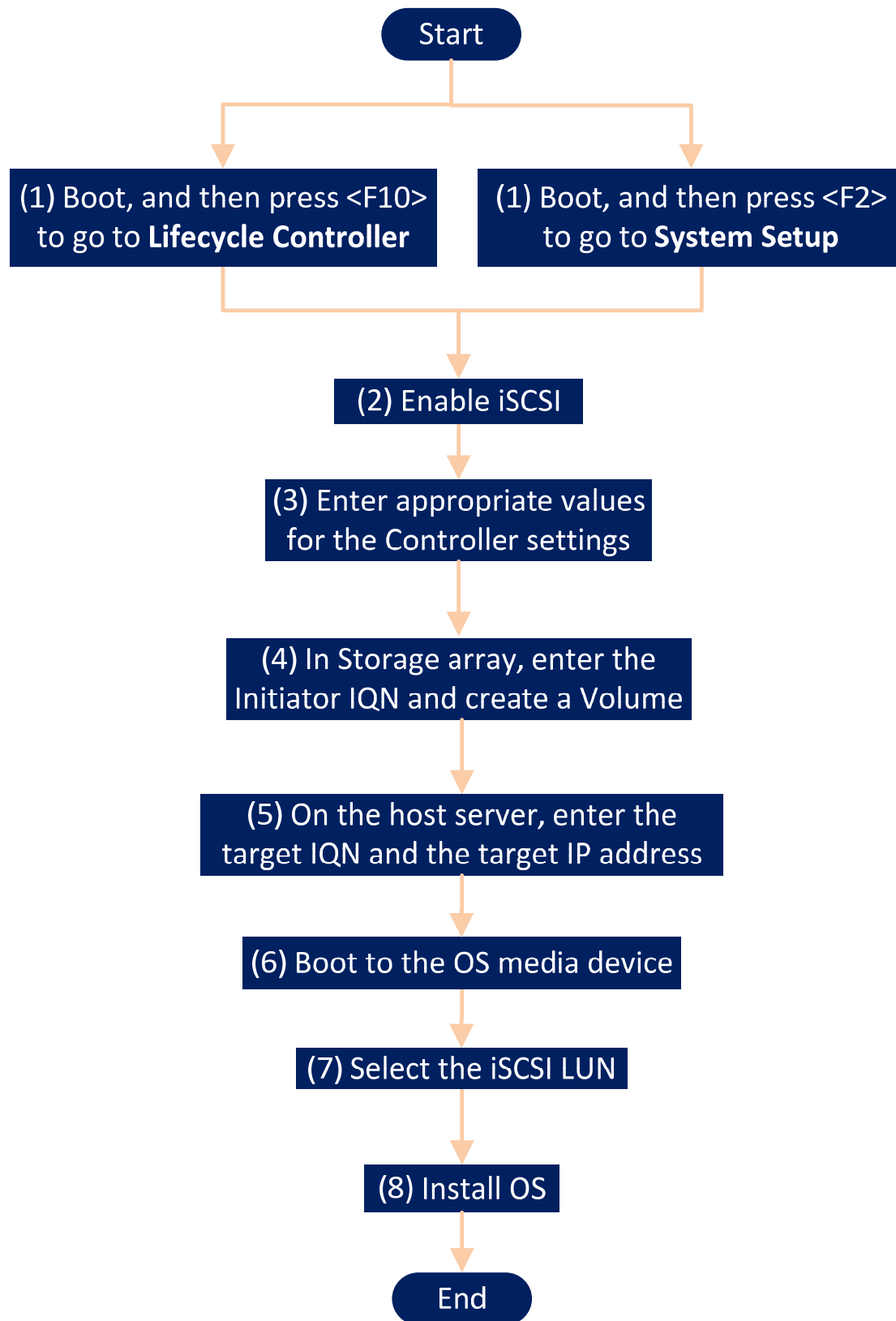
iSCSI Overview

iSCSI is an (Internet Protocol) IP-based storage networking standard for linking data storage facilities. By carrying SCSI commands over IP networks, iSCSI is used to facilitate data transfers over intranets and to manage storage over long distances. iSCSI can be used to transmit data over local area networks (LANs), wide area networks (WANs), or the Internet and can enable location-independent data storage and retrieval.

iSCSI-based SAN Architecture



Flow Chart for OS Deployment Using iSCSI LUN



Deploying Operating System on iSCSI and FCOE LUN

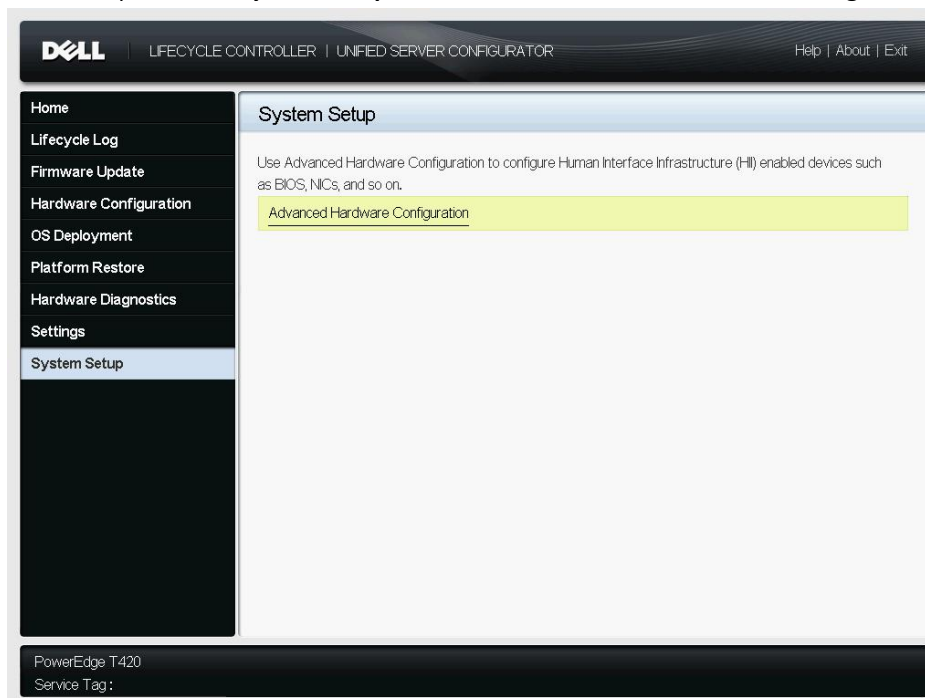
Configuring iSCSI Boot Parameters for Qlogic and OS Installation

By setting up a basic iSCSI boot configuration, you can configure your initiator, contact network devices, and set up an iSCSI boot target. When setting up a basic iSCSI boot configuration you must do the following:

1. Press F10 to open Lifecycle Controller.

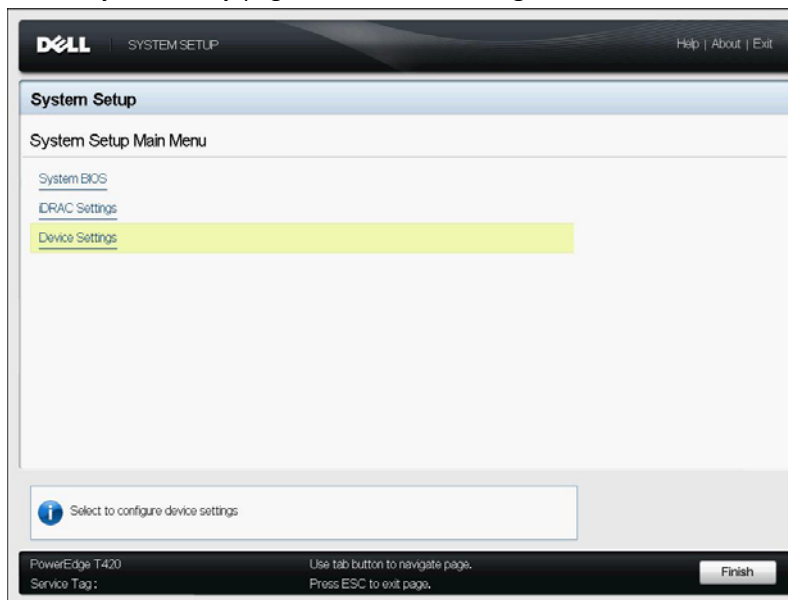


2. In the left pane, click **System Setup**, and then click **Advanced Hardware Configuration**.

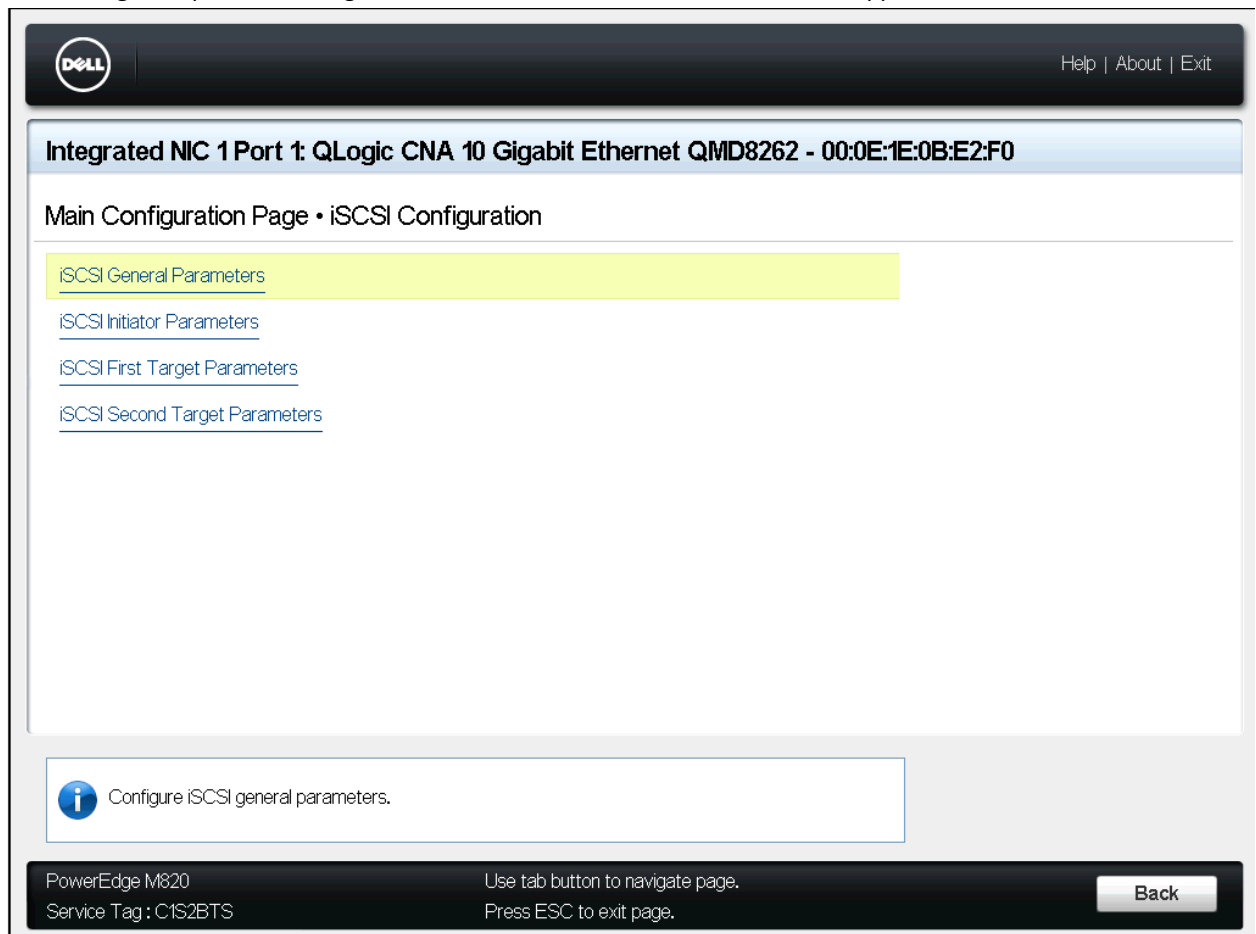


Deploying Operating System on iSCSI and FCOE LUN

3. On the **System Setup** page, click **Device Settings**.



4. Select Qlogic adapter and configure the iSCSI initiator name and enable boot support.



Deploying Operating System on iSCSI and FCOE LUN

5. Restart the server.
6. Boot to OS media, select iSCSI LUN during installation, and then complete the installation.

Note: If there are multiple controllers in your system, your iSCSI Initiator name may be different for each controller.

For other network cards, different adapter settings are present. Refer to the mentioned references.

Intel and Broadcom:

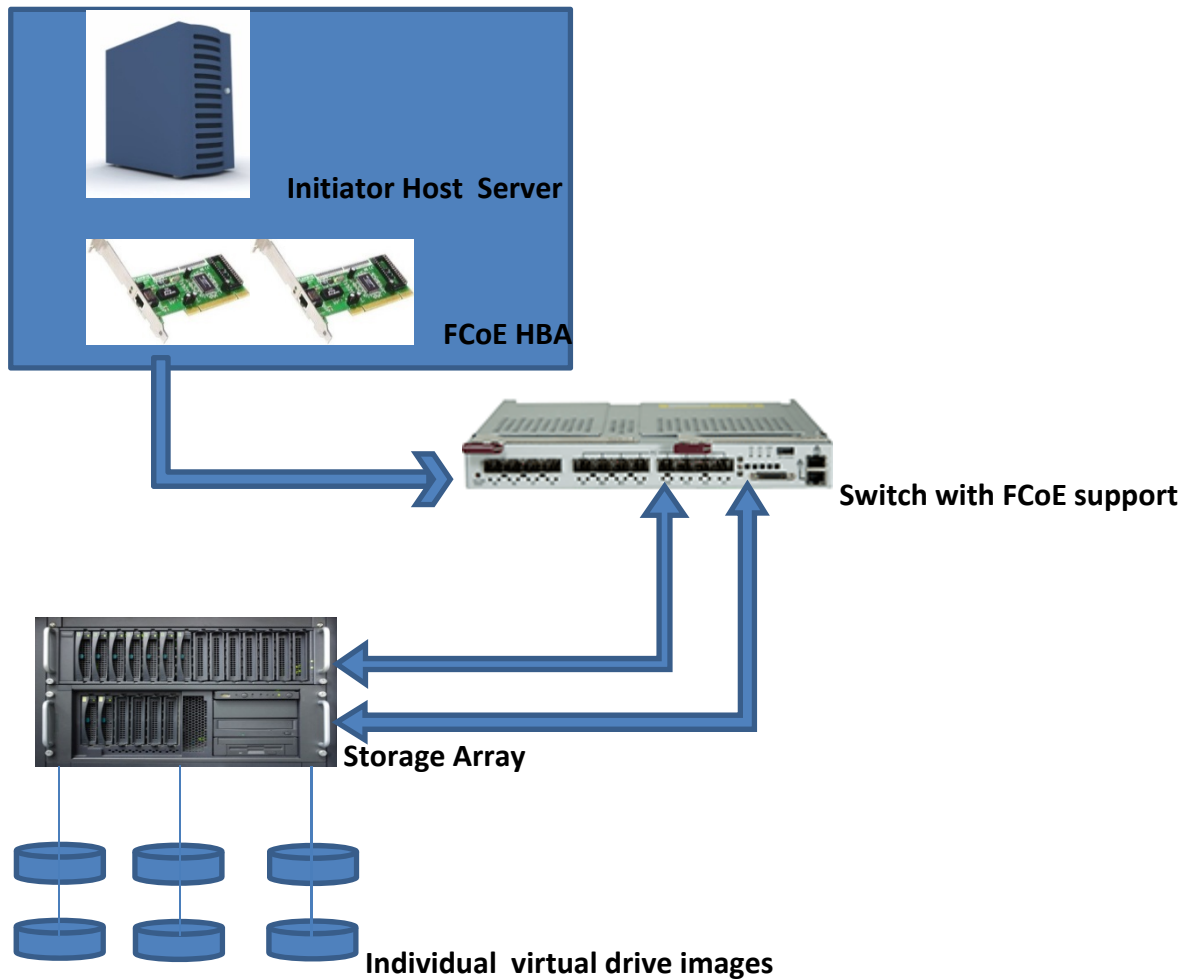
[http://i.dell.com/sites/content/business/solutions/whitepapers/en/Documents/Instructions to Perform Boot from iSCSI for Dell Storage Arrays.pdf](http://i.dell.com/sites/content/business/solutions/whitepapers/en/Documents/Instructions_to_Perform_Boot_from_iSCSI_for_Dell_Storage_Arrays.pdf)

Emulex: http://www-dl.emulex.com/support/hardware/documentation/nif/12-03/oc_boot_manual.pdf

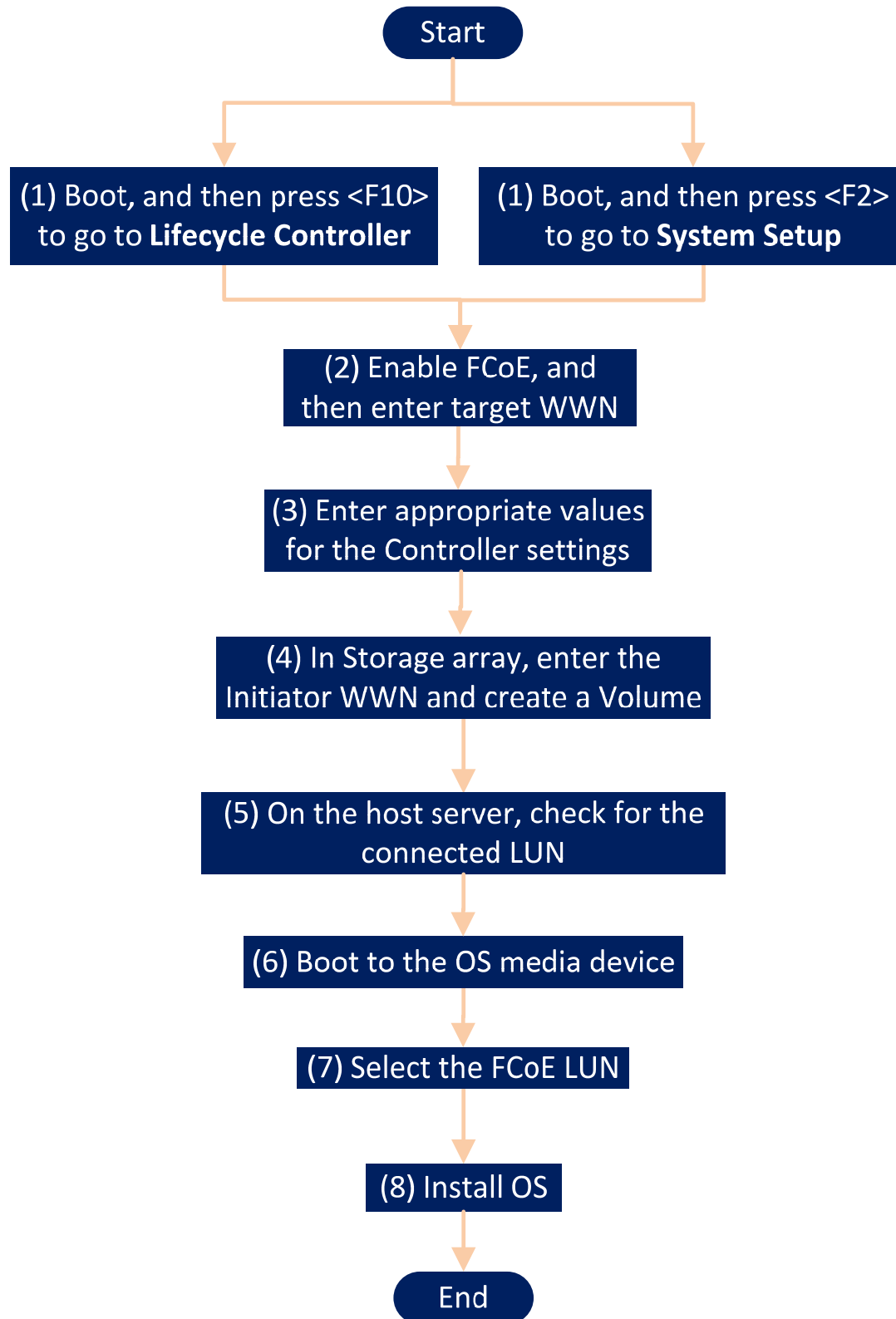
FCoE Overview

FCoE provides a method to transport Fibre Channel frames on top of an Ethernet infrastructure. In summary, unaltered Fibre Channel frames are encapsulated in an Ethernet header, sent over a lossless Ethernet fabric, and un-encapsulated when they reach the target.

FCoE—based SAN Architecture



Flow Chart Showing OS Deployment Using FCoE LUN



Deploying Operating System on iSCSI and FCOE LUN

Configuring FCoE Boot Parameters for Qlogic and OS Installation

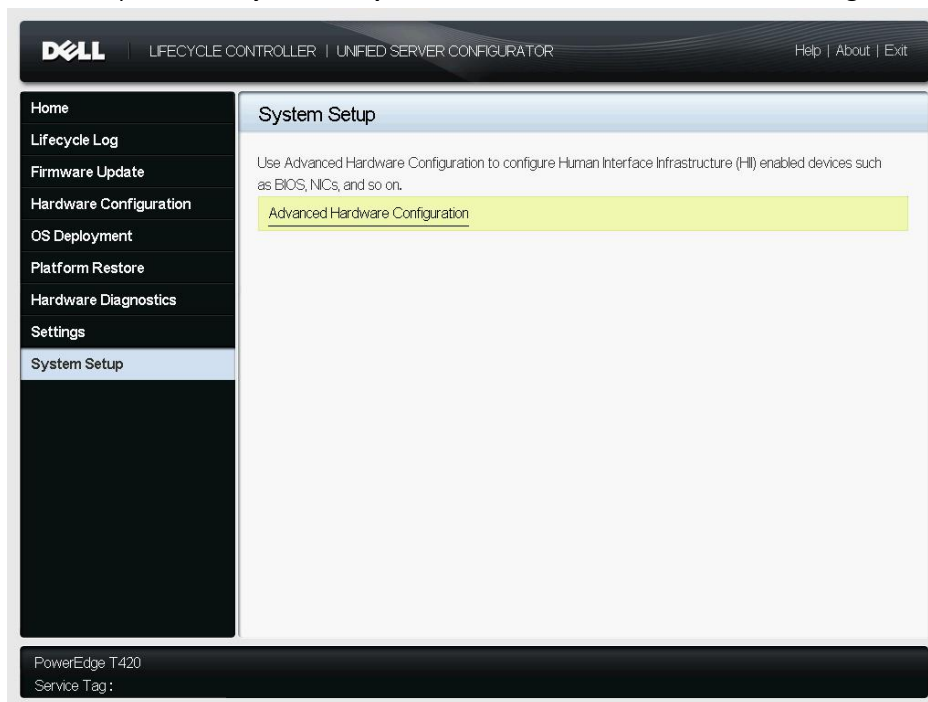
To support an FCoE boot process, a network adapter on the host must have a specially configured FCoE boot firmware. When you configure the firmware, you enable the adapter for the software FCoE boot and specify the boot LUN parameters.

1. Press F10 to open Lifecycle Controller.

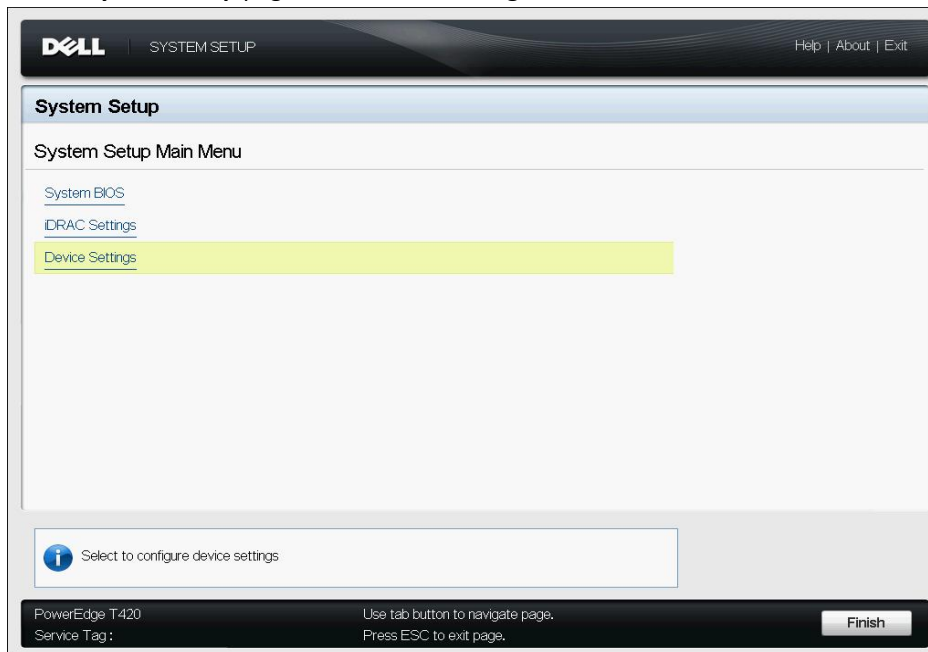


Deploying Operating System on iSCSI and FCOE LUN

2. In the left pane, click **System Setup**, and then click **Advanced Hardware Configuration**.

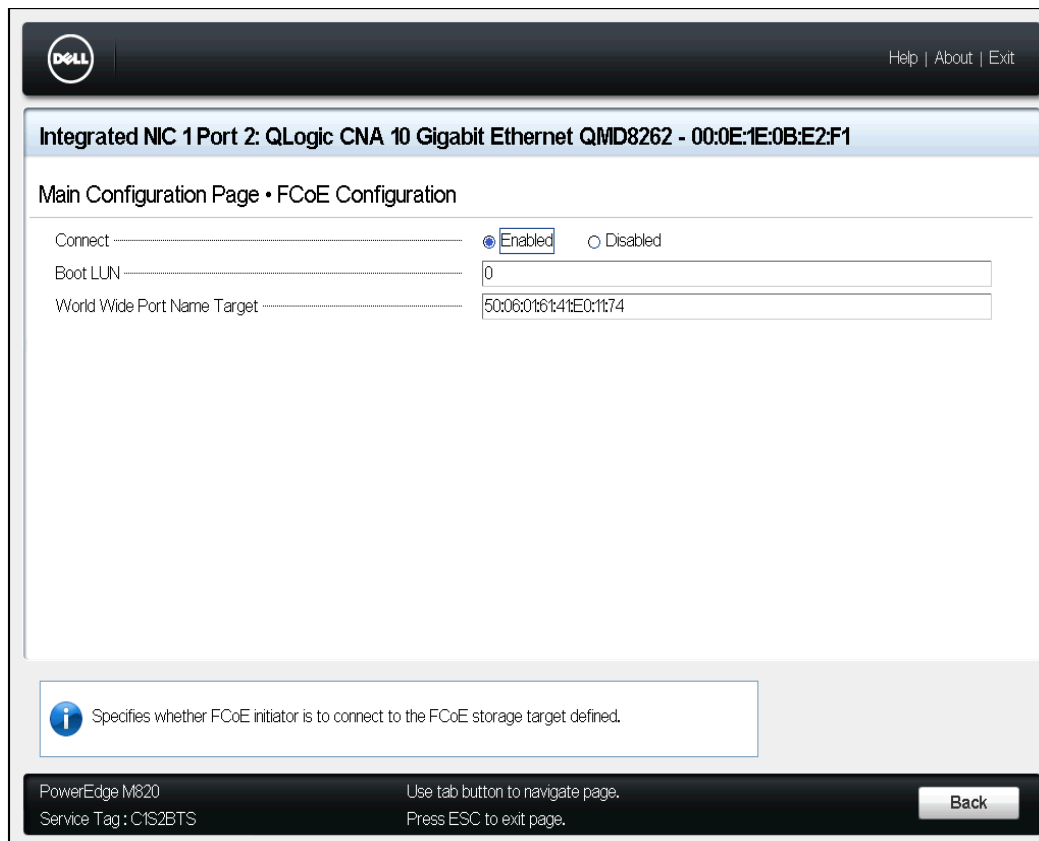


3. On the **System Setup** page, click **Device Settings**.



4. Select Qlogic adapter and configure

Deploying Operating System on iSCSI and FCOE LUN



The image shows a Dell BIOS configuration screen for FCoE. At the top, the Dell logo is on the left and 'Help | About | Exit' is on the right. Below this is a header bar with the text 'Integrated NIC 1 Port 2: QLogic CNA 10 Gigabit Ethernet QMD8262 - 00:0E:1E:0B:E2:F1'. The main section is titled 'Main Configuration Page • FCoE Configuration'. It contains three configuration items: 'Connect' with radio buttons for 'Enabled' (selected) and 'Disabled'; 'Boot LUN' with a text box containing '0'; and 'World Wide Port Name Target' with a text box containing '50:06:01:61:41:E0:11:74'. Below these is an information box with an 'i' icon and the text 'Specifies whether FCoE initiator is to connect to the FCoE storage target defined.' At the bottom, a dark bar contains 'PowerEdge M820' and 'Service Tag : C1S2BTS' on the left, 'Use tab button to navigate page. Press ESC to exit page.' in the center, and a 'Back' button on the right.

Integrated NIC 1 Port 2: QLogic CNA 10 Gigabit Ethernet QMD8262 - 00:0E:1E:0B:E2:F1

Main Configuration Page • FCoE Configuration

Connect ☒ Enabled ☐ Disabled

Boot LUN

World Wide Port Name Target

i Specifies whether FCoE initiator is to connect to the FCoE storage target defined.

PowerEdge M820
Service Tag : C1S2BTS

Use tab button to navigate page.
Press ESC to exit page.

Back

5. Restart the server.

6. Boot to OS media and Select FCoE LUN during installation and complete the installation.

For other network cards, different adapter settings are present. Refer the mentioned references.

Intel: http://en.community.dell.com/techcenter/extras/m/white_papers/20118779.aspx

Bcom: http://en.community.dell.com/techcenter/extras/m/white_papers/20242976.aspx

Emulex: http://www-dl.emulex.com/support/hardware/documentation/nif/12-03/oc_boot_manual.pdf

Abbreviations

BIOS: Basic Input/Output System

HII: Human Interface Infrastructure

IP: Internet protocol

iSCSI: Internet Small Computer System Interface

FCoE: Fibre Channel over Ethernet

LUN: Logical unit number

RAID: redundant array of independent disks

SAN: storage area network

SCSI: Small Computer System Interface

WWN: World Wide Name

References

[http://i.dell.com/sites/content/business/solutions/whitepapers/en/Documents/Instructions to Perform Boot from iSCSI for Dell Storage Arrays.pdf](http://i.dell.com/sites/content/business/solutions/whitepapers/en/Documents/Instructions_to_Perform_Boot_from_iSCSI_for_Dell_Storage_Arrays.pdf)

http://www-dl.emulex.com/support/hardware/documentation/nif/12-03/oc_boot_manual.pdf

<http://www.intel.ie/content/dam/www/public/us/en/documents/guides/fcoe-user-guide.pdf>

http://www-dl.emulex.com/support/elx/r32/b24/docs/other/nif_bootcode_manual_elx.pdf

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