

Dell EqualLogic – Red Hat Enterprise Linux 6.2 Boot from SAN

A Dell EqualLogic best practices technical white paper

Storage Infrastructure and Solutions Engineering Dell Product Group November 2012

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1 Introduction

This document provides instructions for configuring Dell[™] PowerEdge[™] 12th Generation (12G) family of servers to boot Red Hat[®] Enterprise Linux[®] 6.2 from iSCSI SAN-based boot images residing on Dell[™] EqualLogic[™] PS Series arrays.

The evolution of server and storage virtualization as well as the adoption of Storage Area Networks (SANs) by SMB, Departmental, and Enterprise markets has created the demand to boot servers directly from SANbased volumes (Logical Unit Numbers or LUNs). Beyond the obvious flexibility and power efficiency benefits of not needing Direct-Attached Storage (DAS) Boot Disks in servers, Boot from SAN allows for quick reconfiguration and deployment of multiple operating system- and application-specific images.

1.1 Scope

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The process for configuring a boot from iSCSI SAN can vary considerably. Factors that determine the exact process include the type of network adapter used to boot from SAN, the specific operating system and multi-path I/O software being installed, and the type of iSCSI SAN arrays used to store the boot volumes.

Component:	Details:
Operating System	Red Hat Enterprise Linux 6.2
Server	Dell PowerEdge 12G Family • Process validated on PowerEdge R620, system BIOS v1.2.6
Network Interface Controllers	Broadcom [®] BCM5720 • Firmware v7.2.20 Intel [®] i350-t • Firmware v13.1.10
Storage	Dell EqualLogic PS Series • Process validated on PS6100XV, firmware v6.0.1
Multi-path software	Host integration Tools for Linux v1.1.0

In this document, we limit our focus to the steps required to configure the iSCSI SAN boot scenarios as shown in the following table.

2 Procedure

The following section provides detailed instructions for each key configuration process.

2.1 Configuring the iSCSI target

In order to boot from an iSCSI SAN there must be a target volume created on the storage array dedicated to the boot partition of the server operating system. This target volume must be accessible by the storage host initiator.

On Dell EqualLogic PS Series storage array groups the boot from SAN volume can be created from within the Group Manager application interface.

- 1. Create an iSCSI volume.
- 2. Grant access to the volume from the RHEL 6.2 storage initiator using IP address range, IQN name, or CHAP authentication.
- 3. Record the iSCSI volume IQN name and CHAP authentication details if applicable.

Modify volume settings	X
Volume boot-from-SAN	0
	General Space Advanced
	Volume iSCSI settings iSCSI target: com.equallogic: 4-52aed6-a847ec882-940004bad7a50636-boot-from-san Public alias: boot-from-SAN ✓ Aljow simultaneous connections from initiators with different IQNs Allow only if your environment can safely handle multiple initiators accessing the target. Volume RAID preference ● Automatic ■ RAID 50 ■ RAID 51 ■ RAID 52 ■ RAID 53 ■ RAID 54 ■ RAID 54 ■ RAID 6
	Thin provisioning modes
	Generate initiator error when in-use warning limit is exceeded Leave online when maximum in-use space is exceeded
	V OK X Cancel

Figure 1 Dell EqualLogic PS Series Group Manager iSCSI volume properties

2.2 Configuring the iSCSI initiator

The next step is to configure the onboard Broadcom BMC5720 or an add-in Intel i350-t network adapter to act as an iSCSI initiator and connect to the newly created EqualLogic PS Series volume. Once connected, the storage host can install RHEL 6.2 to and then boot from the iSCSI target volume.

- 1. Boot the storage host.
- 2. Press [F10] to enter the Dell Lifecycle Controller Unified Server Configurator (USC).

D idrac-BDRSGT1, PowerEdge R620, User: root, 2.3 fps					
	ONTROLLER UNFIED SERVER CONFIGURATOR	Help About Exit			
Home Lifecycle Log Platform Update Hardware Configuration OS Deployment Platform Restore Hardware Diagnostics LC Settings System Setup	LIFECYCLE CONTROLLE Rele	TR 2 EASE 10			
PowerEdge R620 Service Tag: BDRSGT1 Current User(s): root: 192.168.105.72					

Figure 2 Dell Lifecycle Controller Unified Server Configurator (USC)

3. Select System Setup, Advanced Hardware Configuration, and then Device Settings.



2.2.1 Configuring the Broadcom NIC

Note: For configuration instructions of an Intel NIC, skip to section 2.2.2.

The following section provides instructions for configuring the onboard Broadcom BCM5720 network adapter as the iSCSI initiator.

idrac-BDRSGT1, PowerEdge R620, User: root, 1.1 fps	
rirtual Media File View Macros Tools Power Chat Performance Help	
DELL SYSTEM SETUP	Help About Exit
System Setup	
Device Settings	
Integrated RAID Controller 1: Dell PERC < PERC H310 Mini> Configuration Utility	
Integrated NIC 1 Port 1: Broadcom Gigabit Ethernet BCM5720 - 24:86:FD:F4:93:64	
Integrated NIC 1 Port 2: Broadcom Gigabit Ethernet BCM5720 - 24:86:FD:F4:93:65	
Integrated NIC 1 Port 3: Broadcom Gigabit Ethernet BCM5720 - 24:B6:FD:F4:93:66	
Integrated NIC 1 Port 4: Broadcom Gigabit Ethernet BCM5720 - 24:B6:FD:F4:93:67	
NIC in Slot 3 Port 1: Intel(R) Gigabit 2P I350-t Adapter - A0:36:9F:01:C1:70	
NIC in Slot 3 Port 2: Intel(R) Gigabit 2P I350-t Adapter - A0:36:9F:01:C1:71	
Please note: Only devices which conform to the Human Interface Infrastructure (HII) in the UEFI Specification are displayed in this menu.	
Configure Device Parameters.	
PowerEdge R620 Arrow keys and Enter to select Service Tag: BDRSGT1 Esc to exit page, Tab to change focus	Finish
irrent User(s): root : 192.168.105.72	

Figure 3 Device Settings menu

4. To use the onboard Broadcom BCM5720, select **Integrated NIC 1Port 1: Broadcom Gigabit Ethernet BCM5720** in the **Device Settings** menu.

D idrac-BDRSGT1, PowerEdge R620, User: root, 1.5 fps						
Virtual Media File View Macros Tools Power Chat Performance Help						
		Help About Exit				
Integrated NIC 1 Port 1: Broadcom Gig	abit Ethernet BCM5720 - 24:B6:FD:F	4:93:64				
Main Configuration Page						
Firmware Image Menu						
MBA Configuration Menu						
iSCSI Boot Configuration Menu						
Blink LEDs						
Chip Type	BCM5720 A0					
PCI Device ID	165F					
Bus:Dev:Func	01:00:00					
Link Status						
Permanent MAC Address	24:B6:FD:F4:93:64					
Virtual MAC Address	24:B6:FD:F4:93:64					
Firmware image information.						
PowerEdge R620 Service Tag: BDRSGT1	Arrow keys and Enter to select Esc to exit page, Tab to change focus	Default Finish				
Current User(s): root : 192.168.105.72						

Figure 4 Broadcom BCM5720 Main Configuration Page

5. The adapter firmware is viewable in the **Firmware Image Menu**. After the firmware version is noted, return to the **Main Configuration Page**.

6. Select MBA Configuration Menu.

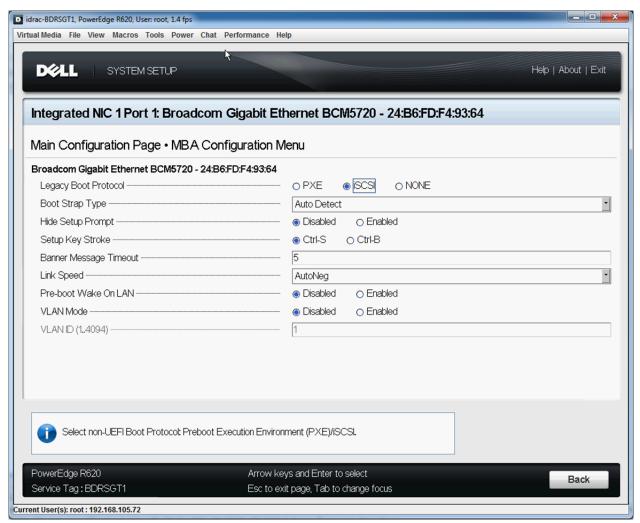


Figure 5 Broadcom BCM5720 MBA Configuration Menu

- 7. Set the Legacy Boot Protocol to iSCSI.
- 8. Return to the Main Configuration Page.

9. Select iSCSI Boot Configuration Menu and then iSCSI General Parameters.

D idrac-BDRSGT1, PowerEdge R620, User: root, 2.2 fps					
irtual Media File View Macros Tools Power Chat Performance	Help				
		Help About Exit			
Integrated NIC 1 Port 1: Broadcom Gigabit I Main Configuration Page • iSCSI Boot Configu					
Broadcom Gigabit Ethernet BCM5720 - 24:B6:FD:F4:93:6 TCP/IP Parameters via DHCP IP Autoconfiguration iSCSI Parameters via DHCP CHAP Authentication Boot to iSCSI Target DHCP Vendor ID Link Up Delay Time Use TCP Timestamp Target as First HDD					
IUN Busy Retry Count					
PowerEdge R620 Arrow keys and Enter to select Back Service Tag: BDRSGT1 Esc to exit page, Tab to change focus Back					
rrent User(s): root : 192.168.105.72					

Figure 6 Broadcom BCM5720 iSCSI General Parameters

- 10. To use a static IP address, set the **TCP/IP parameters via DHCP** and **iSCSI Parameters via DHCP** to **Disabled**. To use CHAP authentication, set **CHAP Authentication**, set to **Enabled**.
- 11. Return to the iSCSI Boot Configuration Menu.

12. Select iSCSI Initiator Parameters.

Didrac-BDRSGT1, PowerEdge R620, User: root, 3.4 fps					
DOLL SYSTEM SETUP	Help About Exit				
Integrated NIC 1 Port 1: Broadco	n Gigabit Ethernet BCM5720 - 24:B6:FD:F4:93:64				
Main Configuration Page • iSCSI B	oot Configuration Menu • iSCSI Initiator Parameters				
Broadcom Gigabit Ethernet BCM5720 - 24:	36.FD:F4:93:64				
IP Address	10.10.0.71				
Subnet Mask	255.255.0				
Subnet Mask Prefix					
Default Gateway	0.0.0.0				
Primary DNS	0.0.0.0				
Secondary DNS	0.0.0.0				
iSCSI Name	iqn.1995-05.com.broadcom.iscsiboot				
CHAP ID					
CHAP Secret					
Configure initiator IP address.					
PowerEdge R620	Arrow keys and Enter to select				
Service Tag: BDRSGT1	Esc to exit page, Tab to change focus				
ent User(s): root : 192.168.105.72					

Figure 7 Broadcom BCM5720 iSCSI Initiator Parameters

- 13. Set the initiator IP Address, Subnet Mask, and if required, the Default Gateway, DNS, iSCSI IQN, CHAP ID, and CHAP Secret.
- 14. Exit to the iSCSI Boot Configuration Menu.

15. Select iSCSI First Target Parameters.

idrac-BDRSGT1, PowerEdge R620, User: root, 2.3 fps rtual Media File View Macros Tools Power Chat Perform	mance Help
DELL SYSTEM SETUP	Help About Exit
Integrated NIC 1 Port 1: Broadcom Giga	abit Ethernet BCM5720 - 24:B6:FD:F4:93:64
Main Configuration Page • iSCSI Boot Co	onfiguration Menu • iSCSI First Target Parameters
Broadcom Gigabit Ethernet BCM5720 - 24:B6:FD:F. Connect	Disabled Enabled 10.10.0.100 3260
	Arrow keys and Enter to select Esc to exit page, Tab to change focus Back

Figure 8 Broadcom BCM5720 iSCSI First Target Parameters

- 16. Set Connect to Enabled.
- 17. Set **IP Address** as the IP address of the EqualLogic Group hosting the iSCSI volume to be used for booting from SAN.
- 18. Set **iSCSI Name** to the iSCSI IQN of the volume.
- 19. Set CHAP ID and CHAP Secret if using CHAP authentication.
- 20. Press [Esc] until prompted to save, and then save adapter settings.
- 21. Press [Esc] until the USC is displayed.
- 22. Press [**Esc**] and choose to reboot host so that newly configured iSCSI boot device will appear in BIOS boot list.

2.2.2 Configuring the Intel NIC

The following section provides instructions for configuring an add-in Intel i350-t network adapter as the iSCSI initiator.

1. From the Device Settings menu, select NIC in Slot X Port 1: Intel(R) Gigabit 2P I350-t Adapter.

idrac-BDRSGT1, PowerEdge R620, User: root, 1.1 fps					
Virtual Media File View Macros Tools Power Chat Performance Help					
	Help About Exit				
NIC in Slot 3 Port 1: Intel(R) Gigabit 2P I350-t	Adapter - A0:36:9F:01:C1:70				
Main Configuration Page					
PORT CONFIGURATION MENU	<u> </u>				
Firmware Image Properties					
NIC Configuration					
iSCSI Configuration					
Blink LEDs (range 0-15 seconds)	0				
PORT CONFIGURATION INFORMATION					
UEFI Driver:					
Adapter PBA:					
Chip Type:					
PCI Device ID	1521				
PCI Bus:Device:Function:	05:00:00				
Firmware Image Properties					
	eys and Enter to select Default Finish xit page, Tab to change focus				
Current User(s): root : 192.168.105.72					

Figure 9 Intel i350-t Main Configuration Page

- 2. To view the adapter firmware, select Firmware Image Properties.
- 3. Return to the Main Configuration Page.

4. Select NIC Configuration.

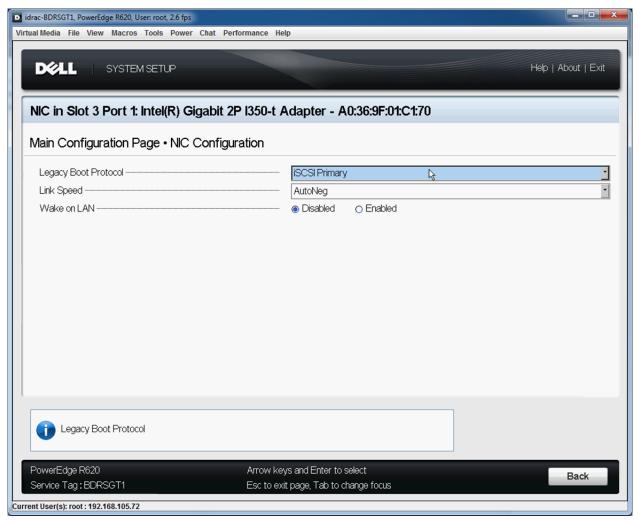


Figure 10 Intel i350-t NIC Configuration

5. Set Legacy Boot Protocol to iSCSI Primary, and return to the Main Configuration Page.

6. Select iSCSI Configuration and then iSCSI General Parameters.

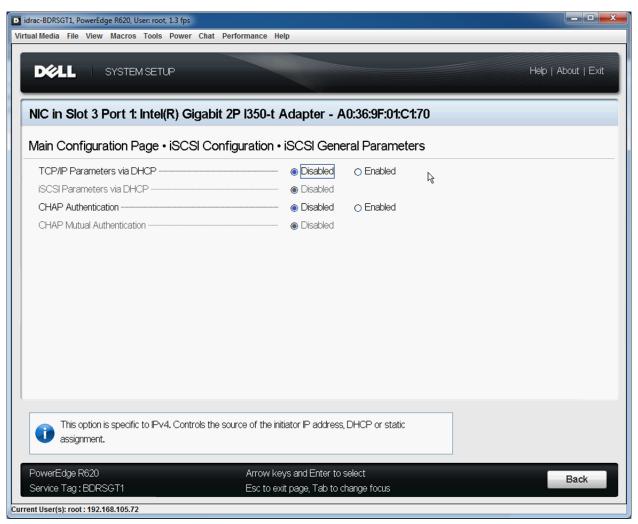


Figure 11 Intel i350-t iSCSI General Parameters

- 7. If a static IP address is being used, set TCP/IP Parameters via DHCP to Disabled.
- 8. If using CHAP authentication, set CHAP Authentication to Enabled.
- 9. Return to iSCSI Configuration.



10. Select iSCSI Initiator Parameters.

IC in Slot 3 Port 1 Intel(R) Gigabit 2P I350-t Adapter - A0:36:9F:01:C1:70 Adaress P Address P Address Subnet Mask 255:255.0 Default Gateway 00.00 ISCSI ION 620-Intel CHAP D CHAP Secret	ac-BDRSGT1, PowerEdge R620, User: root, 2.9 fp: al Media File View Macros Tools Powe		
Main Configuration Page • iSCSI Configuration • iSCSI Initiator Parameters P Address [0.00.72] Submet Mask 255.255.0 Default Gateway [0.00.0] ISCSI INN rfe20-Intel CHAP D [] CHAP Secret [] Specifies the P address of the initiator.	DELL SYSTEM SETUP		Help About Ex
P Address 10.10.0.72 Subnet Mask 255.255.255.0 Default Gateway 00.0.0 iSCSI IQN r620-intel CHAP D	llC in Slot 3 Port 1: Intel(R) G	Gigabit 2P 1350-t Adapter - A0:36:9F:01:C1:70	
Subnet Mask 255.255.0 Default Gateway 0.0.00 SCSI IQN r620-intel CHAP D	Nain Configuration Page • iSC	SI Configuration • iSCSI Initiator Parameters	
Default Gateway 0.00.0 ISCSI IQN r620-intel CHAP D	IP Address	10.10.0.72	
ISCSI IQN	Subnet Mask	255.255.255.0	
CHAP ID CHAP Secret	Default Gateway	0.0.0.0	
CHAP Secret	iscsi IQN	r620-intel	
Specifies the IP address of the initiator. WerEdge R620 Arrow keys and Enter to select Back	CHAP ID		
owerEdge R620 Arrow keys and Enter to select Back	CHAP Secret		
owerEdge R620 Arrow keys and Enter to select Back			
Back			
ervice Tag * BDRSGT1 Esc to evit page Tab to change focus	'owerEdge R620 iervice Tag:BDRSGT1	Arrow keys and Enter to select Esc to exit page, Tab to change focus	Back

Figure 12 Intel i350-t iSCSI Initiator Parameters

- 11. Set the initiator IP Address, Subnet Mask and if required, Default Gateway, iSCSI IQN, CHAP ID, and CHAP Secret.
- 12. Return to **iSCSI Configuration**.

13. Select iSCSI Target Parameters.

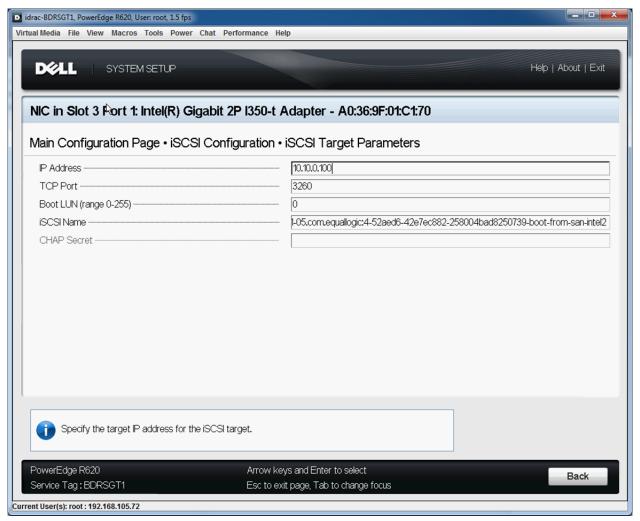


Figure 13 Intel i350-t iSCSI Target Parameters

- 14. Set IP Address as the IP address of the EqualLogic Group hosting the iSCSI volume to be used for booting from SAN.
- 15. Set **iSCSI Name** to the iSCSI IQN of the volume.
- 16. Set CHAP ID and CHAP Secret if using CHAP authentication.
- 17. Press [Esc] until prompted to save, and then save adapter settings.
- 18. Press [Esc] until the USC is displayed.
- 19. Press [**Esc**] and choose to reboot host so that newly configured iSCSI boot device will appear BIOS boot list.



2.3 Configuring the BIOS boot order

Facilitate the installation of RHEL 6.2 by changing the BIOS boot order to the iSCSI volume used when booting from SAN.

- 1. Press [F10] to enter the Dell Lifecycle Controller Unified Server Configurator (USC).
- 2. Select System Setup, and then Advanced Hardware Configuration.

idrac-BDRSGT1, PowerEdge R620, User: root, 3.2 fps					
Virtual Media File View Macros Tools Power Chat Performance Help					
		Help About Exit			
System Setup					
System Setup Main Menu					
System BIOS					
iDRAC Settings					
Device Settings					
	L _e				
	v				
Select to configure system BIOS settings					
PowerEdge R620 Service Tag: BDRSGT1	Arrow keys and Enter to select Esc to exit page, Tab to change focus	Finish			
Current User(s): root : 192.168.105.72					

Figure 14 System Setup Main Menu

3. Select System BIOS, Boot Settings, and then BIOS Boot Settings.

2.3.1 Configuring BIOS boot settings for Broadcom NIC

Note: For instructions on configuring BIOS boot settings for an Intel NIC, skip to section 2.3.2.

The following section provides the steps for configuring the BIOS to iSCSI boot using the onboard Broadcom BCM5720.

D idrac-BDRSGT1, PowerEdge R620, User: root, 2.0 fps	- - ×
Virtual Media File View Macros Tools Power Chat Performance Help	
	Help About Exit
System BIOS	
System BIOS Settings • Boot Settings • BIOS Boot Settings	
Boot Sequence	_
Integrated NIC 1 Port 1 Partition 1: BRCM MBA Slot 0100 v15.2.10 Virtual Optical Drive: Virtual CD	
Hard drive C: Embedded SATA Port Optical Drive E: HL-DT-ST DVD-ROM DU30N	
Virtual Floppy Drive: Virtual Floppy	
Boot Option Enable/Disable	
Virtual Poppy Drive: Virtual Poppy	
I Hard drive C:	
☐ Embedded SATA Port Optical Drive E: HL-DT-ST DVD-ROM DU30N	
Integrated NIC 1 Port 1 Partition 1: BRCM MBA Slot 0100 v15.2.10	
	•
This field tells the system where to find the operating system files needed for system startup. This	
field applies only when Boot Mode is 'BIOS', it has no effect when Boot Mode is 'UEFI'.	
PowerEdge R620 Arrow keys and Enter to select	Back
Service Tag : BDRSGT1 Esc to exit page, Tab to change focus	Euch
L Current User(s): root : 192.168.105.72	

Figure 15 BIOS Boot Settings for Broadcom BCM5720

- 1. Select **Boot Sequence** and set **Integrated NIC 1 Port 1 Partition 1: BRCM MBA Slot 0100 v15.2.10** as the first boot device.
- 2. Set the second boot device as the device providing the installation media. For example, DVD, iDRAC virtual optical drive, or PXE-enabled NIC.
- 3. Press [Esc] until the System Setup Main Menu is reached. If prompted to save, choose to do so.

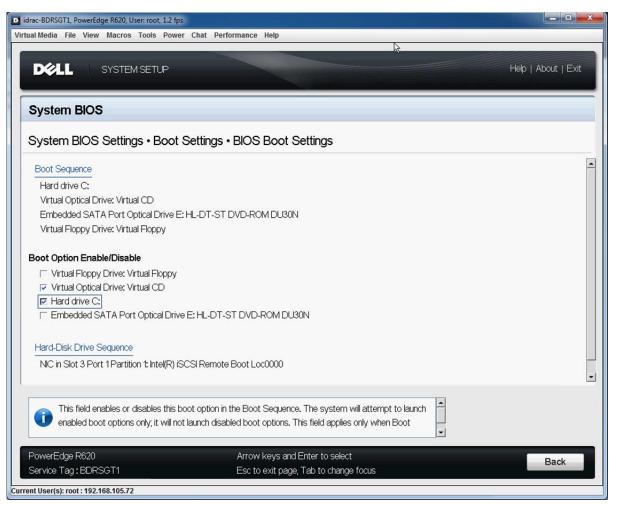
When using the onboard Broadcom BMC5720 as the iSCSI initiator, it is necessary to disable the iSCSI boot for a single boot only. Otherwise, the BIOS will attempt to boot to the empty iSCSI target (which at this point has no operating system boot partition) and fail to boot to the RHEL 6.2 installation media.

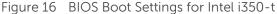
- 4. Select Device Settings.
- 5. Select Integrated NIC 1Port 1: Broadcom Gigabit Ethernet BCM5720.
- 6. Select iSCSI Boot Configuration Menu.
- 7. Select iSCSI General Parameters.
- 8. To prevent a failed boot to the empty iSCSI target volume, set **Boot to iSCSI Target** to **One Time Disabled**
- 9. Return to the **iSCSI Boot Configuration Menu**.
- 10. Return to the Main Configuration Page.
- 11. Press [Esc] until the Device Settings, choosing to save the settings when prompted.
- 12. Press [**Esc**] until the **USC** is reached.
- 13. Make sure the RHEL 6.2 installation media is available in the device configured as the second BIOS boot device.
- 14. Press [**Esc**] and choose to reboot the host. The iSCSI initiator should connect to the iSCSI target prior to booting from the device providing the RHEL 6.2 installation media.



2.3.2 Configuring BIOS boot settings for Intel NIC

The following section provides the steps for configuring the BIOS to iSCSI boot using the add-in Intel i350-t network adapter.





- 1. Select Hard-Disk Drive Sequence.
- 2. Set NIC in Slot X Port 1 Partition 1: Intel(R) iSCSI Remote Boot ahead of the integrated storage controller.
- 3. Select Boot Sequence.
- 4. Set Hard drive C: as the first boot device.
- 5. Set the second boot device as the device providing the installation media. For example, DVD, iDRAC virtual optical drive, or PXE-enabled NIC.
- 6. Press [Esc] until the USC is displayed.
- 7. Make sure the RHEL 6.2 installation media is available in the device configured as the second BIOS boot device.
- 8. Press [**Esc**] and choose to reboot the host. The iSCSI initiator should connect to the iSCSI target prior to booting from the device providing the RHEL 6.2 installation media.



2.4 Install RHEL 6.2 to EqualLogic iSCSI volume

The following steps explain the process for installing RHEL 6.2 to the iSCSI target volume.

1. During the BIOS POST, confirm that the network adapter configured as the iSCSI initiator is connecting to the iSCSI target volume.

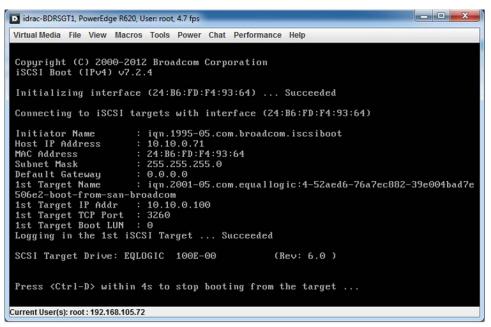


Figure 17 The Broadcom 5720 option ROM connecting to the iSCSI target volume during BIOS POST

D idrac-BDRSGT1, PowerEdge R620, User: root, 4.8 fps	- • • × •
Virtual Media File View Macros Tools Power Chat Performance Help	
Broadcom NetXtreme Ethernet Boot Agent Copyright (C) 2000–2012 Broadcom Corporation All rights reserved. Press Ctrl-S to enter Configuration Menu	
Intel(R) iSCSI Remote Boot version 2.7.88 Copyright (c) 2003–2011 Intel Corporation. All rights reserved. Press ESC key to skip iSCSI boot initialization.	
Initializing adapter configuration - MAC address(A0369F01C170). Using STATIC configuration for primary port, please wait. ISCSI Target Name : iqn.2001-05.com.equallogic:4-52aed6-42e7ec882 d8250739-boot-from-san-intel2 ISCSI Target IP Address : 10.10.0.100 LUN ID: 0 Port: 3260 ISCSI Initiator IP : 10.10.0.72 ISCSI Gateway IP : 0.0.0.0 ISCSI Initiator Name : r620-intel Attempting to connect to target disk using MAC address(A0369F01C170) LUN: 0 DEVICE: EQLOGIC 100E-00 99.0 GB	2-258004ba
Current User(s): root : 192.168.105.72	

Figure 18 The Intel i350-t option ROM connecting to the iSCSI target volume during BIOS POST

1. Once the host boots to the second boot device and loads the RHEL 6.2 installation media, follow the default RHEL 6.2 installer options; including the selection of **Basic Storage Devices**.

devices you' ws below wh	ve selecte	Chat Performance Help	ŝ.				
ws below wh	ve selecte						
ed). Please a	nd which de also indica	te which system drive w	ta drives (these will as system drives				
	•						
					Model	Capacity	Identifier
237952 MB	DELL	pci-0000:03:00.0-scsi-0	0:2:0:0	۲	EQLOGIC 100E-00	100365 MB	ip-10.10.0.100:32
			•				
	be reformat	tted and wiped of any da) ita. Make sure you have	<	10	<u>↓ B</u> ac	k Next
	ed). Please es (to be mo Capacity 237952 MB	ed). Please also indica es (to be mounted only Capacity Vendor 237952 MB DELL devices will be reformat	ed). Please also indicate which system drive w es (to be mounted only) Capacity Vendor Identifier 237952 MB DELL pci-0000:03:00.0-scsi-0 devices will be reformatted and wiped of any da	Capacity Vendor Identifier 237952 MB DELL pci-0000:03:00.0-scsi-0:2:0:0	ed). Please also indicate which system drive will have the es (to be mounted only) Capacity Vendor Identifier 237952 MB DELL pci-0000:03:00.0-scsi-0:2:0:0	ed). Please also indicate which system drive will have the es (to be mounted only) Capacity Vendor Identifier 237952 MB DELL pci-0000:03:00.0-scsi-0:2:0:0	ed). Please also indicate which system drive will have the es (to be mounted only) Capacity Vendor Identifier 237952 MB DELL pci-0000:03:00.0-scsi-0:2:0:0

Figure 19 RHEL 6.2 installer Storage Devices menu

- 2. Since the host already has a connection to the boot from SAN volume using the Broadcom or Intel network adapter boot firmware, the RHEL 6.2 installer will find the target in the iSCSI BIOS Firmware Table (iBFT) residing in the system memory and make it available as an installation target device. Choose the EqualLogic volume as the installation target device and select the local storage for mounting only.
- 3. Complete installation as desired. Note that the RHEL 6.2 installer will obtain the IP address of the network adapter used to connect to the iSCSI target volume from the iBFT and assign it to the same network interface within the OS.
- 4. Restart the server.
- 5. Assign additional network adapters to the SAN subnet as desired.

2.5 Install Host Integration Tools for Linux

The following steps provide instructions for installing Host Integration Tools (HIT) for Linux to manage multiple paths to subsequently connected iSCSI volumes. HIT for Linux actively manages iSCSI volume sessions and load balances across host SAN ports.

- 1. Download equallogic-host-tools-1.1.0-1.iso from https://support.dell.com/equallogic/.
- 2. Burn the ISO file to a CD or use the iDRAC virtual optical drive to mount the ISO file within Linux.
- 3. From the root of the file system provided by the ISO image, run **./install** from a Linux shell as a root-level user.
- 4. Follow the instructions.

When running **ehcmcli status** from another Linux shell as prompted, an error is reported stating that for the iSCSI SAN target volume used to boot from the SAN, the top-tier device is already in use. This is expected because the volume is acting as the root file system for Linux. For this reason, Host Integration Tools does not support MPIO on a boot from SAN volume and MPIO should be explicitly disabled for that volume only.

 To disable MPIO for the boot from SAN volume, add the following two lines to the end of /etc/equallogic/eql.conf where <volume-name> is the volume name of the bootable volume as reported by ehcmcli status.

[MPIO Volume Params <volume-name>]

EnableMPIO = false

6. Complete HIT install, MPIO will be managed by HIT for any other iSCSI target volumes.

Additional resources

Support.dell.com is focused on meeting your needs with proven services and support.

DellTechCenter.com is an IT Community where you can connect with Dell Customers and Dell employees for the purpose of sharing knowledge, best practices, and information about Dell products and your installations.

Referenced or recommended Dell publications:

 Dell EqualLogic PS Series Network Performance Guidelines: <u>http://www.equallogic.com/resourcecenter/assetview.aspx?id=5229</u>

For EqualLogic best practices white papers, reference architectures, and sizing guidelines for enterprise applications and SANs, refer to Storage Infrastructure and Solutions Team Publications at:

• http://dell.to/sM4hJT



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