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## Application Note

# iSCSI Boot from SAN Installation on Red Hat Version 6.9

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### *Products Affected*

HPE® Ethernet 10Gb 2-port 521T Adapter	HPE Ethernet 10/25Gb 2-port 622FLR-SFP28 Converged Network Adapter
HPE Ethernet 10/25Gb 2-port 621SFP28 Adapter	HPE Synergy 6810C 25/50Gb Ethernet Adapter
HPE StoreFabric® CN1300R 10/25Gb Converged Network Adapter	HPE StoreFabric CN1200R 10Gb T Converged Network Adapter
HPE Ethernet 4x25Gb 1-port 620QSFP28 Adapter	—

## 1 Introduction

This application note provides instructions for an iSCSI boot-from-SAN installation on a Red Hat® operating system (OS), version 6.9, on unified extensible firmware interface (UEFI)-based systems. The system must have one of the adapters listed in the Products Affected table.

To perform this installation, follow the instructions in these sections:

- ["Configuring iSCSI Nonoffload/iSCSI Boot Firmware Table" on page 2](#)
- ["Boot into OS using iBFT or L2 and Migrate to iSCSI L4 Boot" on page 6](#)

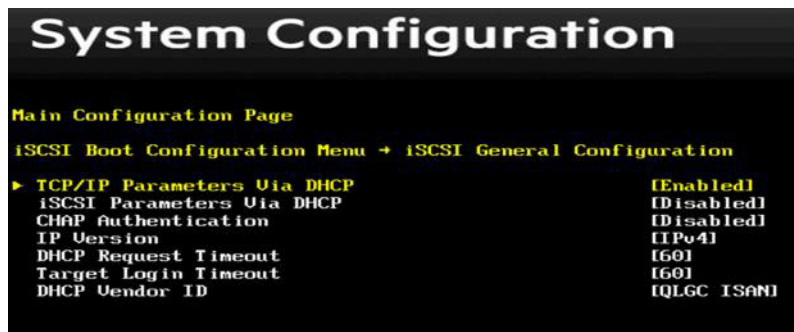
## 2 Configuring iSCSI Nonoffload/iSCSI Boot Firmware Table

To configure the iSCSI nonoffload or iSCSI boot firmware table (iBFT):

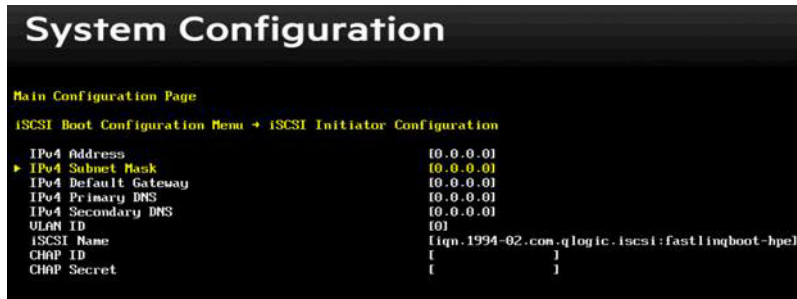
1. Disable iSCSI offloads on all the ports of the adapter under test.
2. Enable iSCSI software as the boot mode for iSCSI iBFT (L2/nonoffload) on the port under test.
  - a. From the System Configuration Main Configuration Page, select **Port Level Configuration**.
  - b. Set the **Boot Mode** parameter to **iSCSI (SW)**.



3. Return to the Main Configuration Page. Navigate to **iSCSI Boot Configuration Menu ▶ iSCSI General Configuration**.
4. Set the appropriate **TCP/IP Parameters Via DHCP** parameters based on the network configuration.



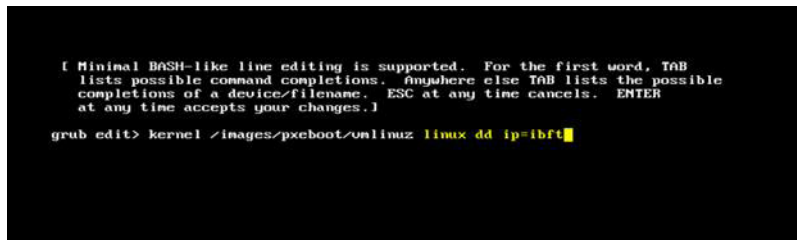
5. Return to the iSCSI Boot Configuration Menu, and then select **iSCSI Initiator Configuration**. Set the appropriate parameters.



6. Return to the iSCSI Boot Configuration Menu, and then select **iSCSI First Target Configuration**. Set the appropriate parameters.



7. Mount the Red Hat 6.9 installation media.
8. Boot the system, and then type **e** to edit the kernel boot parameters.
9. Edit the parameters as shown in the following screen shot, and then press **ENTER** to save your changes.



10. Press **ENTER** and continue until you are prompted for the driver update disk.
11. Unmount the Red Hat 6.9 image.

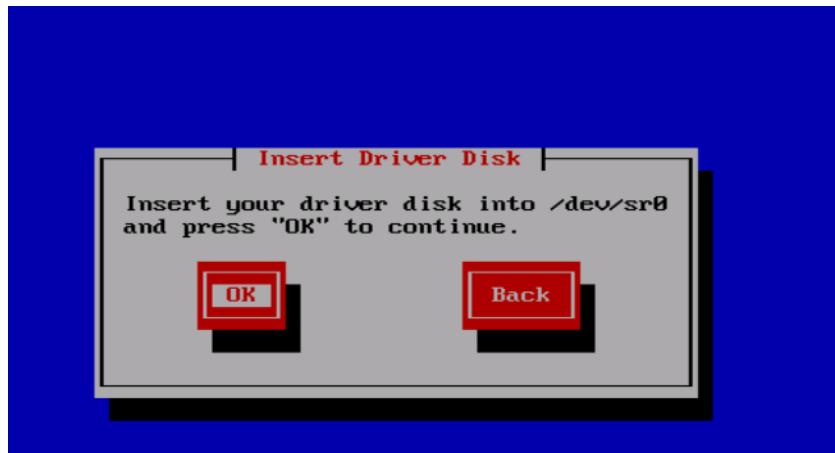
12. Mount the DD kit.

The following page appears:



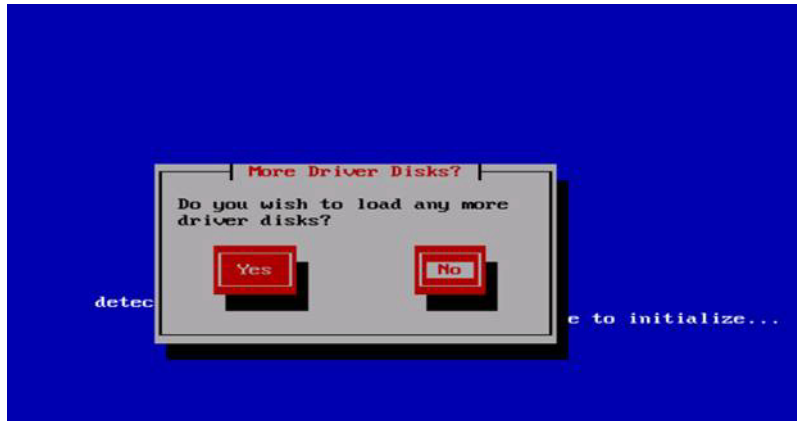
13. Click the **Yes** button.

The following page appears:



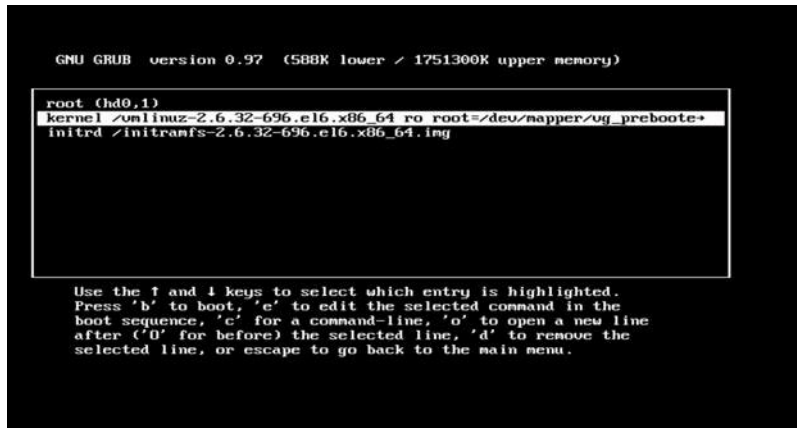
14. Insert the driver disk, and then press the **OK** button.
15. Re-mount the Red Hat 6.9 image and continue the OS installation.

During the installation, the following page appears.



16. Click the **No** button.
17. Complete the installation.
18. Before booting into the L2 boot-from-SAN OS, edit the kernel boot parameters.
  - a. Add **selinux=0**, and then press **ENTER**.
  - b. Type **b** to continue.

Following is an example.



## 3

**Boot into OS using iBFT or L2 and Migrate to iSCSI L4 Boot**

1. Boot into either the iSCSI nonoffload or L2 boot-from-SAN OS.
2. Install the `open-iSCSI` RPM by issuing the following command:

```
# rpm -ivh --force qlgc-open-iscsi-2.0_873.111-1.x86_64.rpm
warning: qlgc-open-iscsi-2.0_873.111-1.x86_64.rpm: Header V4 DSA/SHA1
Signature, key ID 1c9c8ff1: NOKEY
Preparing...                               ##### [100%]
 1:qlgc-open-iscsi                          ##### [100%]
```

3. Install the `iscsiuio` RPM by issuing the following command:

```
# rpm -ivh --force iscsiuiio-2.11.5.2-1.rhel6u9.x86_64.rpm
warning: iscsiuiio-2.11.5.2-1.rhel6u9.x86_64.rpm: Header V3 DSA/SHA1 Signature,
key ID 1c9c8ff1: NOKEY
Preparing...                               ##### [100%]
 1:iscsiuiio                               ##### [100%]
```

4. Edit the `/etc/init.d/iscsid` file.

- a. Add the line
 

```
modprobe -q qedi.
```

- b. Save your changes.

Following is an example.

```
echo -n $"Starting $prog: "
modprobe -q iscsi_tcp
modprobe -q ib_iser
modprobe -q cxgb3i
modprobe -q cxgb4i
modprobe -q bnx2i
modprobe -q be2iscsi
modprobe -q qedi
daemon iscsiuiio
```

5. Edit the `/etc/iscsi/iscsid.conf` file.

- a. Comment the line
 

```
#iscsid.startup = /etc/rc.d/init.d/iscsid force-start
```

- b. Uncomment the line
 

```
iscsid.startup = /sbin/iscsid
```

- c. Save your changes.

Following is an example.

```
#####
# iscsid daemon config
#####
# If you want iscsid to start the first time a iscsi tool
# needs to access it, instead of starting it when the init
# scripts run, set the iscsid startup command here. This
# should normally only need to be done by distro package
# maintainers.
#
# Default for Fedora and RHEL. (uncomment to activate).
#iscsid.startup = /etc/rc.d/init.d/iscsid force-start
#
# Default for upstream open-iscsi scripts (uncomment to
activate).
iscsid.startup = /sbin/iscsid
```

6. Create an iface record for the L4 interface.

The iface record format must be in the format `qedi.<MAC_address>`. In this case, the MAC address must match the L4 interface MAC address on which the iSCSI session is active.

Following is an example.

```
# iscsiadm -m iface -I qedi.14:02:ec:ce:dc:71 -o new
New interface qedi.14:02:ec:ce:dc:71 added

# iscsiadm -m iface -I qedi.14:02:ec:ce:dc:71 -n iface.hwaddress -v 14:02:ec:ce:dc:71
-o update
qedi.14:02:ec:ce:dc:71 updated.

# iscsiadm -m iface -I qedi.14:02:ec:ce:dc:71 -n iface.transport_name -v qedi -o update
qedi.14:02:ec:ce:dc:71 updated.

# iscsiadm -m iface -I qedi.14:02:ec:ce:dc:71 -n iface.bootproto -v dhcp -o update
qedi.14:02:ec:ce:dc:71 updated.

# iscsiadm -m iface -I qedi.14:02:ec:ce:dc:71 -n iface.ipaddress -v 0.0.0.0 -o update
qedi.14:02:ec:ce:dc:71 updated.

# iscsiadm -m node -T iqn.1986-03.com.hp:storage.p2000g3.13491b47fb -p
192.168.100.9:3260 -I qedi.14:02:ec:ce:dc:71 -o new
New iSCSI node
[qedi:[hw=14:02:ec:ce:dc:71,ip=0.0.0.0,net_if=,iscsi_if=qedi.14:02:ec:ce:dc:71]
192.168.100.9,3260,-1 iqn.1986-03.com.hp:storage.p2000g3.13491b47fb] added
```

7. Edit the `/boot/efi/EFI/redhat/grub.conf` file.
  - a. Remove the line
 

```
ifname=eth5:14:02:ec:ce:dc:6d
```
  - b. Remove the line
 

```
ip=ibft
```
  - c. Add the line
 

```
selinux=0
```
  - d. Save your changes.

Following is an example.

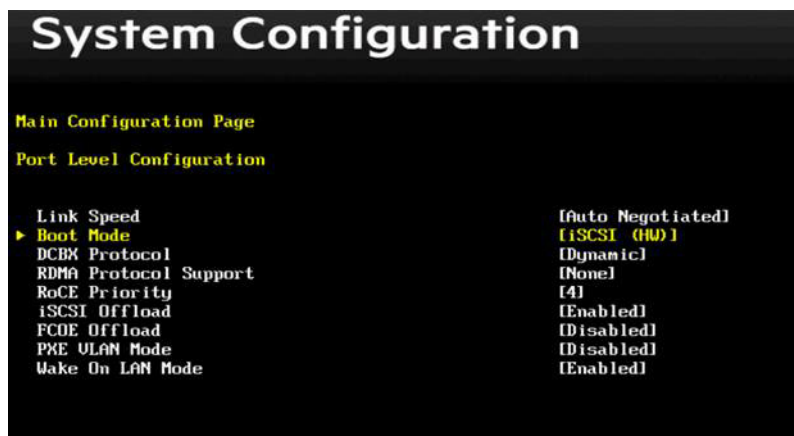
```
kernel /vmlinuz-2.6.32-696.el6.x86_64 ro root=/dev/mapper/vg_prebooteit-lv_root
rd_NO_LUKS iscsi_firmware LANG=en_US.UTF-8 ifname=eth5:14:02:ec:ce:dc:6d rd_NO_MD
SYSEFONT=lataarcyrehb-sun16 crashkernel=auto rd_NO_DM rd_LVM_LV=vg_prebooteit/lv_swap
ip=ibft KEYBOARDTYPE=pc KEYSABLE=us rd_LVM_LV=vg_prebooteit/lv_root rhgb quiet
initrd /initramfs-2.6.32-696.el6.x86_64.img
```

```
kernel /vmlinuz-2.6.32-696.el6.x86_64 ro root=/dev/mapper/vg_prebooteit-lv_root
rd_NO_LUKS iscsi_firmware LANG=en_US.UTF-8 rd_NO_MD SYSEFONT=lataarcyrehb-sun16
crashkernel=auto rd_NO_DM rd_LVM_LV=vg_prebooteit/lv_swap KEYBOARDTYPE=pc KEYSABLE=us
rd_LVM_LV=vg_prebooteit/lv_root selinux=0
initrd /initramfs-2.6.32-696.el6.x86_64.img
```

8. Build `initramfs` by issuing the following command:
 

```
#dracut -f
```
9. Reboot the system.
10. Navigate to HII ► System Configuration ► adapter port under test ► Port Level Configuration.
 

The Port Level Configuration page appears.





11. On the Port Level Configuration page:
  - a. Set the **iSCSI Offload** parameter to **Enabled**.
  - b. Set the **Boot Mode** parameter to **iSCSI HW**.
12. Save your changes.
13. Reboot the system.

The boot-from-SAN OS can now boot through the iSCSI offload.

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<b>Document Revision History</b>
Revision A, October 19, 2017
Revision B, January 23, 2019
Revision C, August 12, 2019
<b>Changes</b>
Re-branded to Marvell. No technical changes.



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