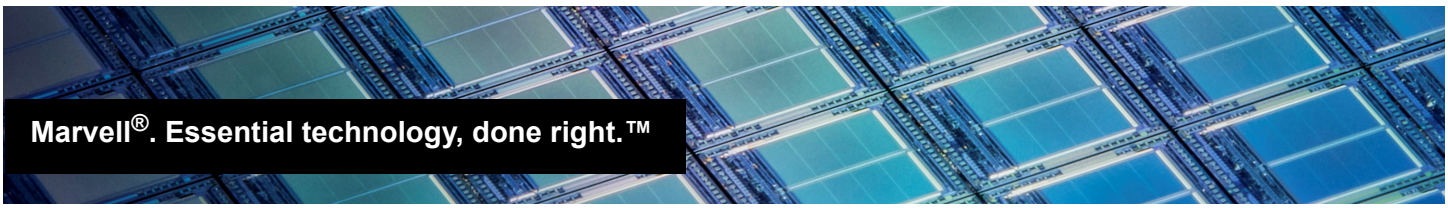

iSCSI Boot from SAN Installation on Red Hat® Version 6.9

Products Affected

HPE Ethernet 10Gb 2-port BASE-T QL41401-A2G Adapter (521T)	HPE Ethernet 10/25Gb 2-port FLR-SFP28 QL41401-A2G CNA (622FLR)
HPE Ethernet 10/25Gb 2-port SFP28 QL41401-A2G Adapter (621SFP28)	HPE Synergy 6810C 25/50Gb Ethernet Adapter
HPE CN1300R 10/25Gb Converged Network Adapter	HPE CN1200R 10Gb BASE-T Converged Network 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

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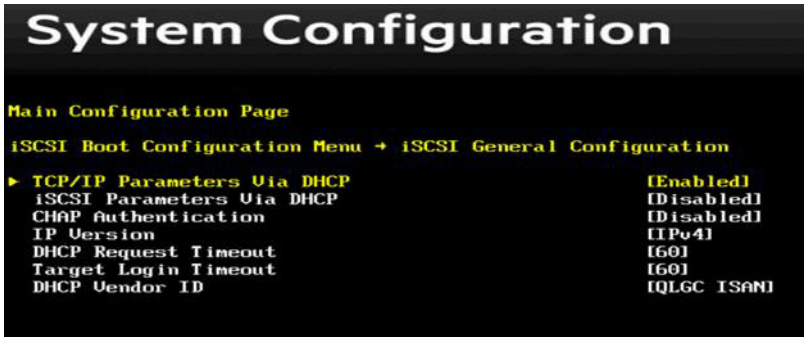
2 Configuring iSCSI Nonoffload/iSCSI Boot Firmware Table

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.



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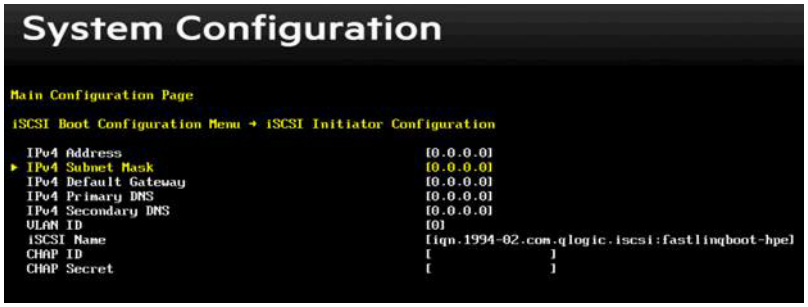
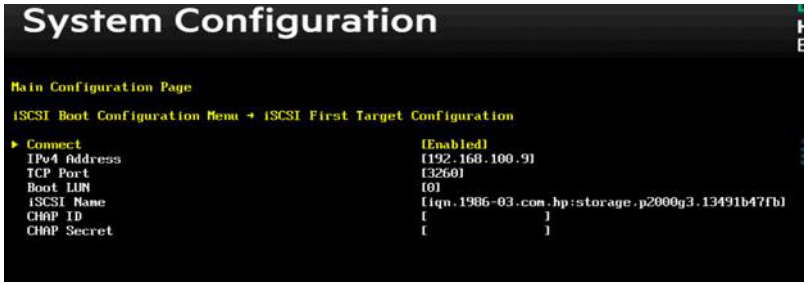
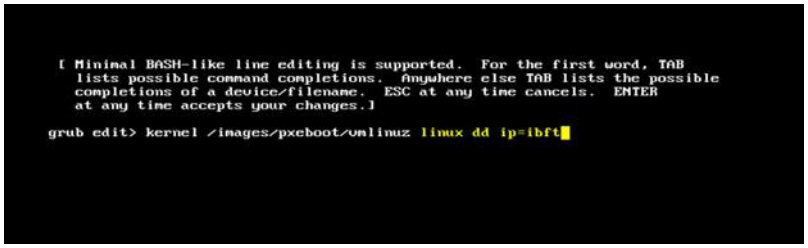
5. Return to the iSCSI Boot Configuration Menu, and then select **iSCSI Initiator Configuration**. Set the appropriate parameters.



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.

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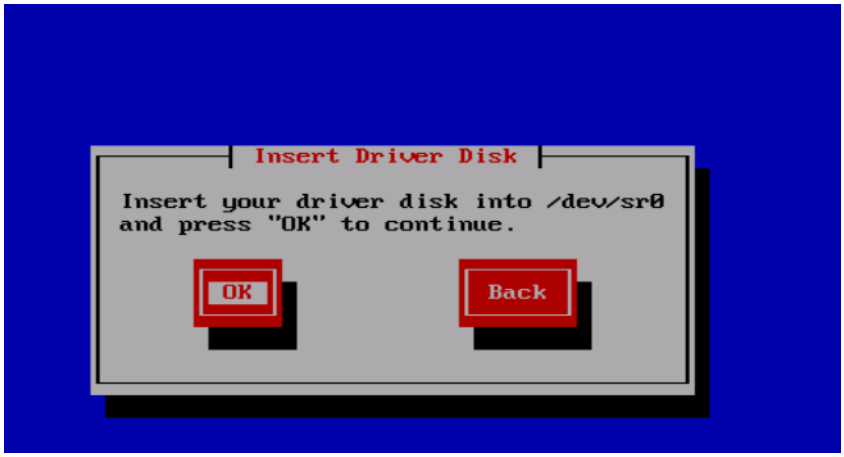
12. Mount the DD kit.

    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.

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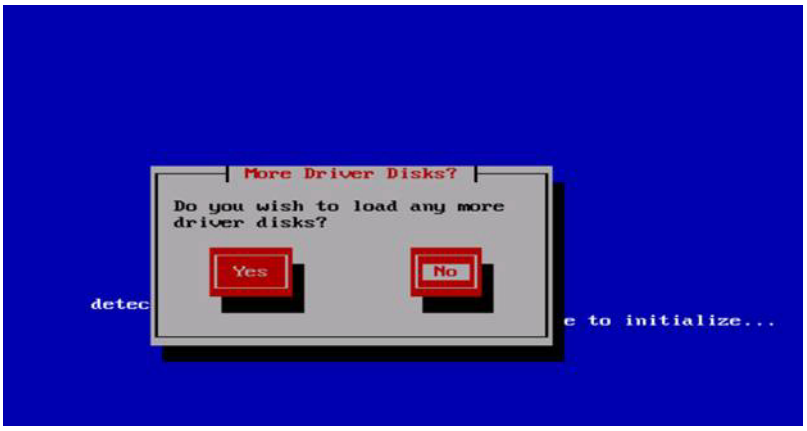
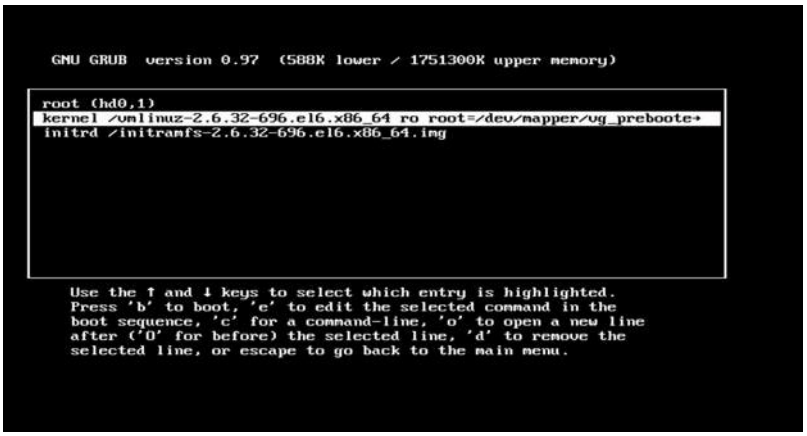
During the installation, the following page appears.



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.



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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 `isciuio` RPM by issuing the following command:

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

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.

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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
```


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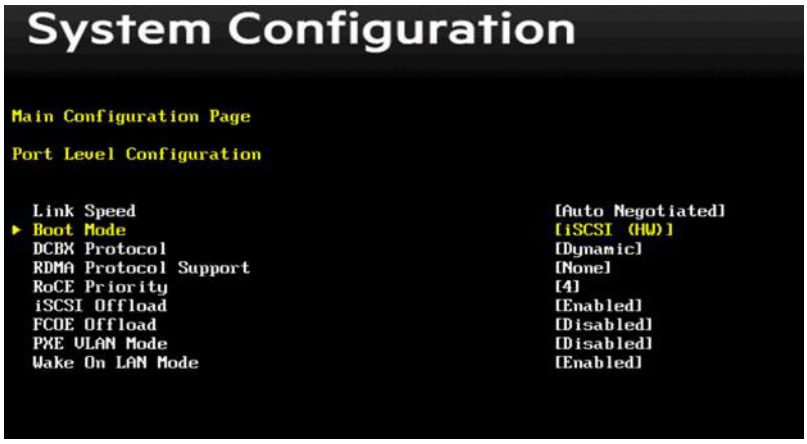
7. Edit the `/boot/efi/EFI/redhat/grub.conf` file.
   a. Remove the line
      `ifname=eth5:14:02:ec:ce:dc:6d`
   b. Remove the line
      `ip=ibft`
   c. Add the line
      `selinux=0`
   d. Save your changes.

   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 SYSFONT=latarcyrheb-sun16
crashkernel=auto rd_NO_DM rd_LVM_LV=vg_prebooteit/lv_swap ip=ibft  KEYBOARDTYPE=pc KEYTABLE=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 SYSFONT=latarcyrheb-sun16 crashkernel=auto rd_NO_DM
rd_LVM_LV=vg_prebooteit/lv_swap KEYBOARDTYPE=pc KEYTABLE=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**.

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12. Save your changes.
13. Reboot the system.

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

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Document Revision History
Revision A, October 19, 2017
Revision B, January 23, 2019
Revision C, August 12, 2019
Revision D, April 10, 2021
Changes
Updated to new Marvell logo and template.
In the Products Affected table, updated the model descriptions for the 521T, 621SFP28, 622FLR, CN1200R, CN1300R. Removed the HPE Ethernet 4x25Gb 1 port 620QSFP28 Adapter.

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