Connecting ProLiant BL p-Class server blades to a third-party SAN

HOWTO

Abstract

This paper provides general procedures for connecting HP ProLiant BL20p G2 and BL40p server blades to third-party Fibre Channel storage area networks (SANs). This procedure assumes that the server blades are already properly installed, operating in a p-Class enclosure, and running a supported operating system. The detailed steps provided address installation of single path, non-redundant, connections of QLogic-based Fibre Channel adapters, including the HP ProLiant BL20p G2 Dual Port Fibre Channel Mezzanine Card, HP Storage Works FCA2214 single channel 2-GB FC HBA, HP StorageWorks FCA2214DC dual channel 2-GB FC HBA, QLogic QLA2340 single channel 2-GB FC HBA, and QLogic QLA2342 dual channel 2-GB FC HBA.

Prerequisites

The ProLiant BL p-Class server blades should be installed in the BL p-Class server blade enclosure and functional with a supported operating system (OS) installed. Each ProLiant BL20p G2 server blade should have the Dual Port Fibre Channel Mezzanine Card installed. Two RJ-45 Patch Panel 2 interconnect blades or two GbE2 Interconnect Switches should be installed in the enclosure interconnect bays. Small form factor pluggable (SFP) Fibre Channel transceivers, which came with the Dual Port Fibre Channel Mezzanine Card, should be installed in the Patch Panel 2 transceiver cages for all BL20p G2 server blades in the enclosure. Each ProLiant BL40p server blade should have at least one QLogic 2342 HBA installed in its PCI-X expansion slots.

This paper provides a procedure that utilizes both ProLiant Essentials Rapid Deployment Pack (RDP)[1] and Insight Lights-Out (iLO)[2] for the ProLiant BL p-Class system[3]. This procedure is for single-channel HBA configurations only. Refer to the SAN vendor for dual-channel software installations.

Process at a Glance

In summary, the process is as follows:

- General Setup
  - Install and connect the hardware.
  - Change the NVRAM settings of the HBAs (if applicable).
- OS-Specific Driver Installation
  - Install the HBA driver.
- Verify the SAN connection
  - Zone the switch and allocate disk space.
  - Verify the installation.

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[1] For more information, go to http://www.hp.com/servers/rdp.
2 For more information, go to http://www.hp.com/servers/lights-out.
3 To download the white paper, go to ftp://ftp.compaq.com/pub/supportinformation/papers/tc030901tb_rev0_us.pdf.

Installation Details

The procedure below provides instructions for connecting the BL p-Class server blades to the SAN, changing the HBA NVRAM settings (EMC SANs only), and installing the HBA driver.

1. Connect the server blades to the Fibre Channel switch.

ProLiant BL20p G2 server blades

The Dual Port Fibre Channel Mezzanine Card provides two Fibre Channel ports using a dual-port QLogic 2300 series HBA (ISP2312). This is an OEM version of the QLogic 2342 HBA.

Connect one end of the FC cables to the Patch Panel 2 front panel transceiver ports or the GbE2 Interconnect Switch OctalFC Interconnect Module and the other end of the FC cables to the FC SAN switch. The server blades are numbered 1 through 8 from left to right in the enclosure. These server blade numbers correspond to the numbers on the Patch Panel 2 transceiver ports (numbered 1 through 8 from bottom to top) and on the OctalFC Interconnect Module.

Note

The "link" LED next to each Patch Panel 2 front panel transceiver cage will not light up until the appropriate HBA driver is loaded.

ProLiant BL40p server blades

Connect one end of the FC cables to the QLogic 2342 HBA ports at the rear of each BL40p server and connect the other end of the cables to the FC SAN switch.

2. Change the HBA Adapter NVRAM settings and upgrade the BIOS.

The HBA NVRAM settings and BIOS must be upgraded according the SAN vendor's specifications. Please go to http://h18000.www1.hp.com/products/servers/proliant-bl/p-class/storage.html for links to specific SAN vendor web sites.

For EMC SANs:

For the BL20p G2 server containing a Dual Port Fibre Channel Mezzanine Card, you must change the NVRAM settings and upgrade the BIOS to the latest version supported by EMC. Go to the HP web site listed above and click the "Fibre Channel Mezzanine Card Drivers" link next to "EMC Symmetrix and CLARiiON models." When the QLogic site opens, click the Download link for "EMC CLARiiON and EMC Symmetrix/HP BL20p G2 approved common BIOS." Open the .zip file and extract all files to a new folder under the RDP Server Express shared directory (e.g., **\\YourRDP_ServerName\express\EMC\NVram** where \EMC\NVram is the new folder).

There are two methods to change the HBA default settings: using the Rapid Deployment Pack (RDP) utility or using a virtual floppy with iLO Virtual Media. HP recommends that you use the RDP utility because it makes the job of mass deployment much easier by changing the NVRAM settings and BIOS for both HBAs at the same time. Using iLO Virtual Media, you can only change the NVRAM settings for one HBA at a time.

Using the RDP utility:
a. Open the RDP console and create a job called "EMC QLogic NVram update" Double-click the job name to open the Job Properties and click Add to the create the Run Script and type the following script in the Run Script as shown as in Figure 1:
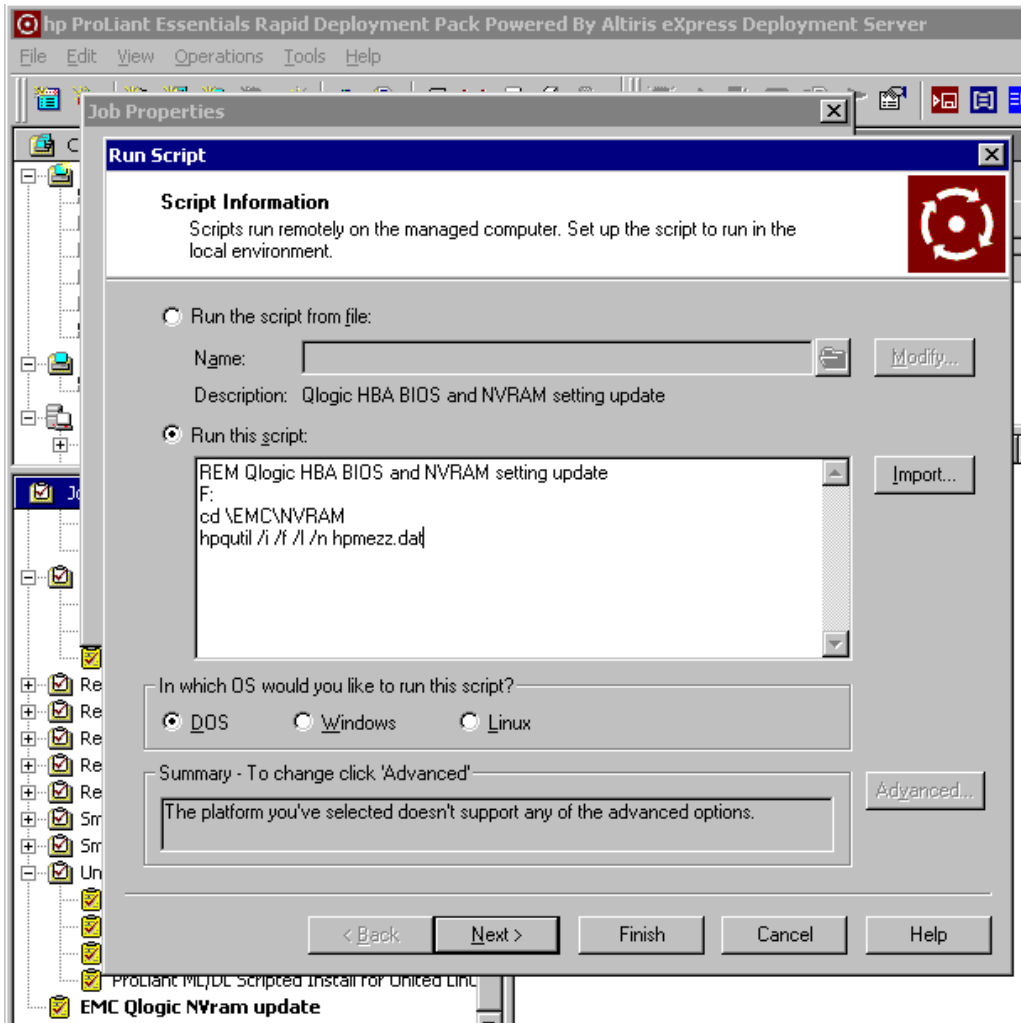   **REM Qlogic Controller NVram and BIOS defaults update for both channels**
    F:
    cd\EMC\Nvram
    hpqutil /i /f /l /n hpmezz.dat

Figure 1. RDP Run Script

b. Drag the job to each server blade icon with a QLogic HBA installed (or create a group and drag it to the group icon). The server will reboot.

c. While the server is rebooting, you can verify that the NVRAM contents were changed. When prompted during reboot, press **CTRL-Q** for Fast!Util to review Host Adapter settings or to obtain the adapter Port Name (WWN) for Zoning administration (step 4) from iLO Remote Console. Compare the HBA settings for the server blade to the EMC Default settings in Figure 2. Some of these settings are listed under Host Adapter Settings and some are listed under Advanced Adapter settings.

Figure 2. EMC certified HBA settings for QLogic 23xx controllers

Host Adapter Settings	EMC Default
Host Adapter BIOS	Disabled
Frame Size	2048
Loop Reset Delay	5
Adapter Hard Loop ID	Disabled
Hard Loop IP	0
Spinup Delay	Disabled
Fibre Channel Tape Support	Disabled
Data Rate	2 (Auto Select)
Advanced Adapter Settings	**EMC Default**
Execution Throttle	256
LUNs per Target	256
Enable LIP Reset	No
Enable LIP Full Login	Yes
Enable Target Reset	Yes
Login Retry Count	8
Port Down Retry Count	45
Link Down Timeout	45
Extended Error Logging	Disabled
RIO Operation Mode	0
Interrupt Delay Timer	0

Using iLO Virtual Media

Before beginning this procedure, create a *DOS-bootable* diskette and copy the Hpqutil.exe and NVRAM files (downloaded previously) onto the diskette. Place the bootable diskette in the floppy drive of the computer running iLO. It may take several minutes to update the NVRAM settings on *each* HBA using a DOS-bootable floppy and iLO Virtual Media. Flashing the BIOS on the card will take even longer.

a. In the iLO window, click the Virtual Devices tab and select Virtual Media from the pop-up menu.
b. Select the floppy drive from the drop down menu and click the Connect button. If you need help, click the help icon (question mark).
c. Physically reboot the server blade by pressing the Restart button or use Virtual Power to reboot the server blade with the Virtual Media diskette or image file via iLO Virtual Media.
d. Open Remote Console and access the target server.
    Type **hpqutil /i /f /l /n hpmezz.dat** at the DOS command prompt and press Enter. It may take several minutes before you receive a message that each channel has been verified successfully.
e. Click the Disconnect button in the Virtual Media window to disconnect the virtual floppy before rebooting the server.

3. Install the vendor-certified HBA Driver.

Note that you are required to use the vendor-certified drivers when connecting to a specific vendor SAN. Go to http://h18000.www1.hp.com/products/servers/proliant-bl/p-class/storage.html to download the vendor-certified HBA driver.

For EMC SANs, click the Fibre Channel Mezzanine Card Drivers link next to "EMC Symmetrix and CLARiiON models." When the QLogic site opens, go to the section titled "HP ProLiant BL20p Mezzanine Card" and then follow one of the procedures below to download and install EMC approved Windows or Linux HBA drivers.

For Windows Drivers

Click the Download link for "EMC CLARiiON and EMC Symmetrix approved common WIN 2000 and WIN 2003 SCSI Miniport 32-bit driver."

Using the RDP utility:
a. Download and unzip the driver files to a RDP server directory (c:\qlogicDriver).
b. Create an RDP "copy files" event that copies the entire qlogicDriver directory to c:\temp\qlogicDriver. Run the event on all servers that have a QLogic HBA installed.
c. Connect to one of the server blades using iLO or Remote Control and open Device Manager. You will see that the two FC HBAs do not have a driver installed (signified by a question mark icon).
d. Double-click on each HBA and click "Re-Install Driver." Navigate to the c:\temp\qlogicDriver folder and continue with the PNP installation.
e. Reboot the server blade and then verify that the correct driver was installed for both HBAs (the HBA icons should not be question marks).
f. Repeat steps "c" through "f" for the remaining server blades.

Using iLO Virtual Media:
a. Download and unzip the driver files to a diskette.
b. In the iLO window, click the Virtual Devices tab and select Virtual Media from the pop-up menu.

c.   Select the floppy drive from the drop down menu and click the Connect button. If you need help, click the help icon (question mark).

d.   Use to Remote Console to access the target server.

e.   Double-click on each HBA and click "Re-Install Driver." Navigate to the a:\qlogicDriver folder and continue with the installation.

f.   Reboot the server blade and then verify that the correct driver was installed for both HBAs (the HBA icons should not be question marks).

g.   Repeat steps "c" through "f" for the remaining server blades.

For Linux Drivers

Download the driver:

a. Click the Download link for "EMC CLARiiON and EMC Symmetrix approved common Linux driver."

b. Double-click on the tar archive and extract the file "qla2x00src-v6.xx.xx.tgz" to the NFS server (/home/qlogic/qla2x00src-v6.xx.xx.tgz) or to a floppy.

c. Copy the tar archive to the target server directory (/home/qlogic) using one of the following methods:

    1. Copy the download file to your NFS server:
        #scp root@yourNFSserverIP:/home/qlogic/qla2x00src-v6.xx.xx.tgz /home/qlogic

    2. In the iLO window:
- Insert floppy with the downloaded tar archive file into the iLO client station.
- Click the Virtual Devices tab and select Virtual Media from the pop-up menu.
- Select the floppy drive from the drop down menu and click the Connect button.
- Use to Remote Console to access the target server and enter the following:
  # mount /dev/sda   /mnt/vfloppy (where /mnt/vfloppy is the iLO virtual floppy mount point)
  # cp /mnt/vfloppy/*.tgz   /home/qlogic

Note
HP RDP provides UL1.0 OS base installation. Please refer to Appendix A for instructions to change UL1.0 to SLE8.

Install the driver:
At the iLO Remote Console, enter the following commands.

a. **# tar -zxvf qla2x00src-v6.xx.xx.tgz** (where 6.xx.xx is the version number, e.g., 6.04.02)

b. For SuSE:
    # make SMP=1 DRIVER=qla2300.o OSVER=linux-$1 install (where $ is the kernel version)
    For RedHat:
    # make SMP=1 DRIVER=qla2300.o install

c. **# depmod -a**

d. **# modprobe qla2300**

e. **# lsmod** (Find "qla2300" in the module list to verify that the QLogic driver is loaded.)

Important
Please check the *EMC Fiber Channel with Qlogic Host Bust Adapters in Linux x86 Environment* document for detailed driver installation and the latest patch requirements.

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4. Zone the Switch.

At this point, the SAN administrator should be able to see the WWN of all attached HBAs. Using this information, the administrator will be able to zone the switch correctly and present as much disk space as needed to each blade. This step must be performed before you can verify that the installation is complete.

5. Installation Verification

For Windows:

Verify that the installation is complete by opening Device Manager and re-scanning for new hardware. The "Disk drives" object should show the attached local SCSI and SAN storage devices. For example, Figure 3 shows attached local SCSI, EMC CLARiiON, and Symmetrix storage devices.

Important
Do not sign the Symmetrix Volume Logix database device.

Figure 3. Device Manager panel

For Linux:

Verify the installation is complete by typing the following command to connect to the storage devices (Figure 4).

 # more /proc/scsi/qla2300/n   where n can be 0 or 1

Figure 4. BL20pG2 server connects to EMC CLARiiON SAN in Linux

```
SCSI Device Information:
scsi-qla0-adapter-node=500508b20080043a;
scsi-qla0-adapter-port=500508b20080043a;
scsi-qla0-target-0=5006016a1060125c;
scsi-qla0-target-1=5006016210601Z5c;

SCSI LUN Information:
(Id:Lun)
( 0: 0): Total reqs 6, Pending reqs 0, flags 0x0, 0:0:81,
( 0: 1): Total reqs 6, Pending reqs 0, flags 0x0, 0:0:81,
( 0: 2): Total reqs 6, Pending reqs 0, flags 0x0, 0:0:81,
( 0: 3): Total reqs 6, Pending reqs 0, flags 0x0, 0:0:81,
( 0: 4): Total reqs 6, Pending reqs 0, flags 0x0, 0:0:81,
( 0: 5): Total reqs 6, Pending reqs 0, flags 0x0, 0:0:81,
```

Appendix A: UL1.0 to SuSE8 system software update instructions

The RDP installation provides only the United Linux UL1.0. base installation; therefore, the following procedure provides a method to change from UL1.0 to SuSE8. This procedure assumes that the SuSE CD1 is mounted and exported in a local NFS server.
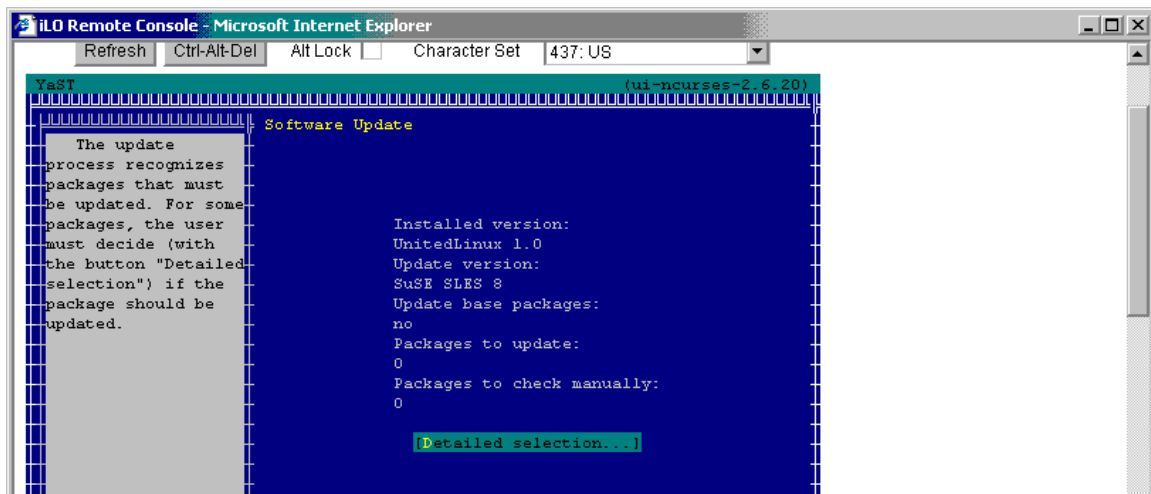
In the iLO Remote Console:

1. Install the rpms provided by the SuSE CD1 script (see Figure 5)
   # mount YourLocalNFSServerIP :/mnt/cdrom /media/cdrom
   # /media/cdrom/install_sles8_rpms.sh

Figure 5. iLO Remote Console

2. Update entire system software with the Yast2 control center:
   # yast2
3. Add the source of installation to use the NFS Server and directory mount from the previous steps.
4. Select Software Update and then Detailed Selection. (see Figure 6)
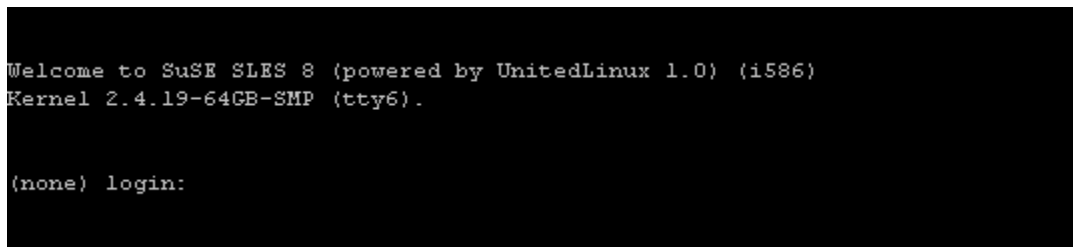
Figure 6. iLO Remote Console

5. To install all packages, click the Actions menu, choose Select[+] from the drop down menu, then select Filter for Selections and select all packages (see Figure 7).

Figure 7. iLO Remote Console
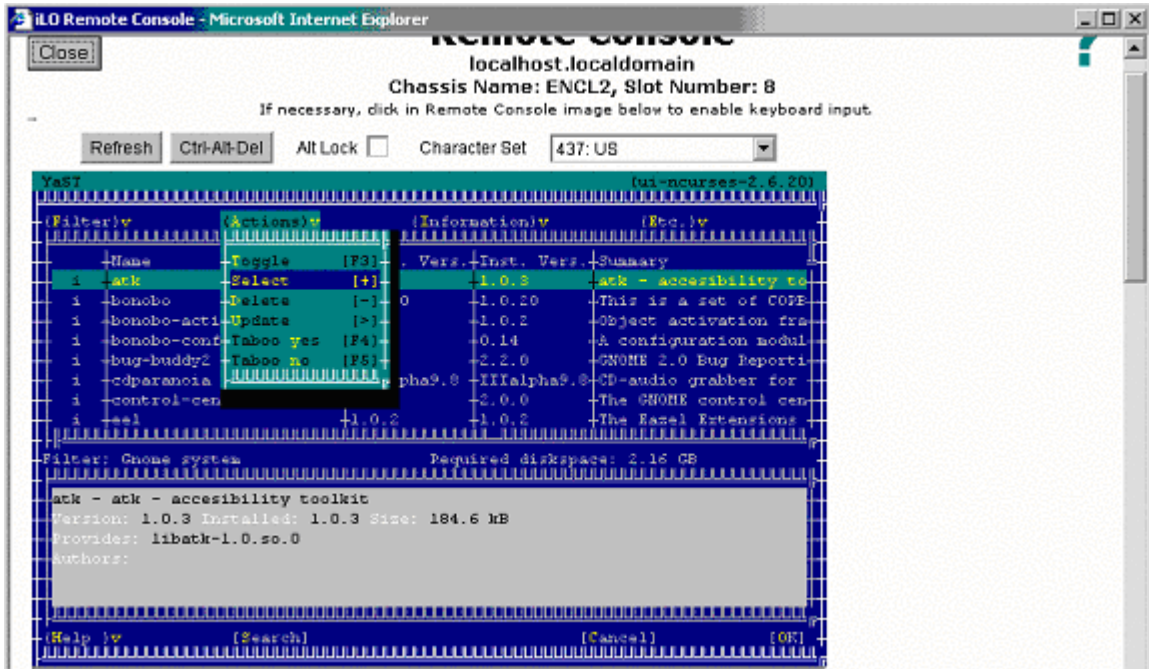
6. When the system software update is successfully completed, the server login screen similar to Figure 8 will open.

Figure 8. Server login screen

The information in this document is subject to change without notice
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