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Contents

Configuring the MSA1000/1500 for External Boot with Linux	
Prerequisites:	3
Configuring a Boot LUN on the MSA:	3
Configuring the Server BIOS:	4
Configuring the Fibre Channel HBA:	5
Qlogic Adapters:	5
Emulex Adapters:	5
Install the Operating System:.....	6
Install MSA1000/1500 drivers & utilities:.....	6
Upgrading to Dual Controller (Active/Active):.....	6
Add the new connection:	7
Configure the additional HBA BIOS:	7
Configure the server BIOS:.....	8
Enable Active/Active failover mode:.....	8
Setup LUN persistence:	8

Configuring the HP StorageWorks Modular Smart Array 1000/1500 for external boot with HP Proliant Servers

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Prerequisites:

- Verify that you have the latest version of firmware installed on your system. The system firmware is located under the Support & Drivers section of your servers' webpage. www.hp.com/go/proliant
- For Blade installs verify the iLO firmware is up to date. The iLO firmware is located under the specific server support page at www.hp.com/go/blades
- Obtain the latest copy of the ProLiant Support Pack. This is located on the **Software, Firmware and Drivers** page of the website related to your server model. www.hp.com/go/proliant
- Obtain the latest copy of the MSA1000 or MSA1500 Support Software CD. The Support Software CD is located on the “software, firmware and drivers” section of the MSA website. www.hp.com/go/msa
- Verify that the HBA firmware is at the latest supported version. If firmware versions are needed for your HBA, they can be downloaded at: www.hp.com/go/san
- Follow the HP StorageWorks MSA1500cs or MSA1000 Modular Smart Array Compatibility guide to verify that your configuration will be supported. This guide is located in the **Technical Documents** section of the MSA websites. www.hp.com/go/msa
- Upgrading to an Active/Active configuration may require a firmware update to the MSA controllers. For instructions on firmware update refer to the **Technical Documents** section of the MSA1500 website as well as the **Software, Firmware and Drivers** section for firmware downloads. www.hp.com/go/msa1500cs

Configuring a Boot LUN on the MSA:

- Ensure that the MSA is powered up and proper zoning is enabled so the MSA is visible to the host.
- Insert the MSA Support Software CD into the host and power cycle the host. It will now boot from the CD.
 - Note: Blade servers must use the Virtual Devices capability of the iLO web interface to boot from the MSA Support Software CD as described below.
 1. Browse to the iLO web interface.
 2. Select the Virtual Devices tab.
 3. Install the MSA1000 Support CD in the drive.
 4. Connect the virtual CD drive.
 5. Power cycle the blade server.

The blade server will now boot to the MSA Support Software CD.

- Choose the language and keyboard setting you desire and click **Continue**.
- You will be presented with an End User License Agreement, click **Agree** to continue.
- Click on the **Launch Array Configuration Utility** image to begin an ACU session.
- Select the desired **MSA1500 CS Controller** on the left and create an appropriate logical disk.
- After the disk is created select **Selective Storage Presentation**, click **enable** and **OK**.
- Change the **Connection Name** field of the appropriate connection from Unknown to your desired naming scheme. i.e.: hostname
 - Note: The HBA must be connected and initialized for the Connection to be listed.
- Set the **Host Mode** field to **Linux** via the drop-down menu.
- Assign the appropriate **Logical Drive** to the host by clicking the check box.
 - Note: Only a single lun is required for installation. Additional LUNs can be added later if required.
- Click **OK** to submit the changes.
- You may be prompted with a warning, read and click **OK** to continue.
- To apply all changes click **Save** in the **Controller State** section of ACU.
- You may be prompted with an informational pop-up, read and click **OK** to continue.
- Click **Exit ACU** at the bottom left of the page.
- Click **Exit** at the top right of the page and **OK** to exit the Software CD. The CD will eject itself and the server will reboot.
 - Note: For Blade servers you must disconnect the Virtual CD from the Virtual Media page of the iLO web interface.

Configuring the Server BIOS:

- When prompted during boot press **F9** to enter the ROM-Based Setup Utility.
- Enter the **Boot Controller Order** section and set the fibre adapter to **Ctrl: 1**.
- Exit RBSU being sure to press **F10** to commit the changes.

Note: If desired, you may disable the embedded Smart Array Controller by performing the following after entering the RBSU.

- Enter the **PCI Devices** section
- Select the Smart Array Controller
- Select **Disable** then exit RBSU

Configuring the Fibre Channel HBA:

Qlogic Adapters:

- During the boot process, a Qlogic HBA message is displayed. At the prompt to enter the Fast!util, press ctrl-Q to enter the Fast!util.
- In the Select Host Adapter Menu, choose the adapter you want to boot, then press Enter.
- In the Fast!Util Options Menu, choose Configuration Settings, then press Enter.
- In the Configuration Settings menu, choose Host Adapter Settings, then press Enter.
- In the Host Adapter Settings menu, change the Host Adapter BIOS to Enabled by pressing Enter.
- In the Selectable Boot Settings menu, enable the Selectable Boot option, then move the cursor to the Primary Boot Port Name, LUN, then press Enter.
- In the Select Fibre Channel Device menu, choose the device to boot from, then press Enter.
- In the Select LUN menu, choose the supported LUN.
- Save the changes by pressing ESC twice.
- Exit Fast!Util

Emulex Adapters:

- As the server boots, the menu for the HBA is displayed. Press <Alt E> to start the Emulex BIOS Utility.
- At the list of HBAs in the server, press 1 -> Enter to select the display HBA
- You are presented with two selections. Note the options at the bottom of the screen to navigate through the menus.
- Press 2 -> Enter to select Configure This Adapter's Parameters.
- You are presented with 9 options, press 1 -> Enter to Enable or Disable BIOS.
- Press 1 -> Enter to enable the BIOS
- Press the PageUp key to return to the previous menu.
- Press the PageUp to return to the first menu.
- Press 1 -> Enter to Configure Boot Devices
- You are presented with a list of saved boot devices.
- Press 1 -> Enter to select Primary Boot.
- You are prompted to select the desired boot device.
- Press 00 -> Enter to clear selected boot entry.
- Press 1 -> Enter to select Primary Boot.

- Press 01 -> Enter to select the entry with the LUN that is presented by the MSA1000
- You are prompted to enter in a two-digit LUN number, enter 00 -> Enter.
- You are presented with a list of available LUNs visible to the HBA.
- Press 01-> Enter to select the first LUN (logical drive 1) on the MSA1000
- You are prompted to select how to boot the device.
- Press 1 -> Enter.
- You are returned to the list of saved boot devices.
- Press x->y to exit the menu and reboot the server.

Install the Operating System:

Installation can now begin either using the Rapid Deployment Pack or by using the OS media. For installations using RDP please refer to the [Rapid Deployment Pack – Windows Edition 3.10 User Guide](#) for instructions. After installation is complete please continue on to the next section.

Install MSA1000/1500 drivers & utilities:

This section will provide necessary updates to driver packages, configuration utilities, and system management software/agents related to HP products via the ProLiant Support Pack.

- Once the system is up untar the ProLiant Support Pack on the host.
- Execute the installation script located within the Support Pack to launch the HP ProLiant Linux Deployment Utility. For example: `sh install760.sh`
- After the utility launches, click on install to begin updating the system.
- Upon completion click return to main menu, this will go back to the beginning window and update the listed entries with status.
- Click exit to close the utility. It should ask to reboot the host; either agree or continue closing the utility and reboot the host.

The host is now setup in a Boot from SAN configuration with a single HBA and single controller MSA storage device. To update this configuration to Active/Active continue on to the next section.

Upgrading to Dual Controller (Active/Active):

For those with existing single controller boot from SAN environments this section can be followed to upgrade to a dual controller Active/Active configuration after performing the following tasks:

- At a minimum, verify that the HBA drivers are up to date. Or by installing the latest ProLiant Support Pack as described earlier in this document.
- Verify the MSA1500 controller firmware for Active/Active is up to date.

Note: For existing Active/Passive environments and/or those running Secure Path, please refer to the Migration documentation located in the Technical Documents section of the MSA1500 website. www.hp.com/go/msa1500cs

Add the new connection:

The boot lun should already be configured per the earlier section in this doc. The new connection needs to be properly configured on the MSA device. Follow the steps listed below to accomplish this.

- Launch the Array Configuration Utility.
 - There are 2 ways to launch the utility:
 - ACU can be installed locally and run on the host.
 - ACU can be run from the MSA Support Software CD.
- Select the boot lun and click on Selective Storage Presentation, click enable and OK.
- Change the Connection Name field of the new connection from Unknown to your desired naming scheme. i.e.: hostname
 - Note: The HBA must be connected and initialized for the Connection to be listed.
- Set the Host Mode field to Linux via the drop-down menu.
- Assign the appropriate Logical Drive to the host by clicking the check box.
- Click OK to submit the changes.
- You may be prompted with a warning, read and click OK to continue.
- To apply all changes click Save in the Controller State section of ACU.
- You may be prompted with an informational pop-up, read and click OK to continue.
- Click Exit ACU

Configure the additional HBA BIOS:

This step should be performed as described previously in this document on the additional HBA or second port on the HBA.

Configure the server BIOS:

This step should be performed as described previously in this document and the additional HBA should be moved as far up the boot order as possible.

Enable Active/Active failover mode:

For a comprehensive list of requirements and application notes it is recommended you obtain the documentation pertaining to Active/Active installations/migrations for the installed HBA and MSA device located in the Technical Documents section of those websites.

- Qlogic
 - (After the Qlogic driver has been installed) Enter the following commands to open the Driver Parameters menu:
 - # cd /opt/hp/src/hp_qla2x00src
 - # ./set_parm
 - At the menu prompt, enter: 1 XP/MSA/EVA Failover.
 - If prompted, enter Y at Would you like to create a new initrd to reflect the changes in the parameters?
 - Enter 5 Quit to exit the menu.
- Emulex
 - In the location that the hp-lpfc driver was untarred, change to the hp-lpfc directory.
 - # cd hp-lpfc-*
 - Run the INSTALL script with the -m option.
 - # ./INSTALL -m
 - If errors are seen due to a previous installation, remove the drivers by running the INSTALL script with the -u option and reinstall.
 - # ./INSTALL -u
 - # ./INSTALL -m

The system should now be setup in a dual HBA, dual controller, Active/Active, boot from san configuration. Without making any lun configuration changes on the MSA device you should now be able to successfully reboot the system.

Setup LUN persistence:

Setting up lun persistence is highly recommended in any Linux environment especially in a boot from san environment where lun configuration changes can take place. Configuration

changes can alter lun presentation to the host causing it to re-order SCSI devices at boot time. Such changes could cause a boot from san system to panic upon reboot.

For Qlogic environments obtain the LUN Persistence and Migration Utility for Linux from the Software Updates page of the HP Secure Path website: <http://www.hp.com/go/securepath>

For Emulex environments HP recommends that you use the Udev utility. For detailed information about this procedure, see “Using the Udev utility with SuSE Linux systems” in the Booting Itanium Linux systems from a storage area network application notes, available in the SAN Boot guide section available on the website: <http://h18006.www1.hp.com/storage/saninfrastructure.html>