Installing Debian GNU/Linux 5.0 ('lenny') for i386 and AMD64 on HP ProLiant Servers

Support Notes

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Abstract

ProLiant servers provide an excellent platform for Linux and are engineered from the ground up to provide performance, reliability, and scalability, using industry-standard components.

This document provides information about installing Debian GNU/Linux 5.0 (codenamed 'lenny'), for the i386 and AMD64 architectures on ProLiant Servers.

1. Hardware Support

Before beginning the installation, please consult the *Debian Capabilities Matrix for ProLiant Servers* to ensure that this version of the operating system is supported on the targeted ProLiant Server. To access this document, click on the **Capabilities matrix** link on the http://www.hp.com/go/proliantdebian HP website.

Note that this HOWTO describes installation for a base ProLiant system; peripherals and plug-in cards have not been tested by HP.

2. Obtaining Additional Information and Software for Debian GNU/Linux on HP ProLiant Servers

You can obtain the latest additional Debian GNU/Linux information, services, and value-add software downloads for your HP ProLiant server from the http://www.hp.com/go/proliantdebian HP website.

At this location, you can access one of the following topics:

- Capabilities matrix
- Downloads
- Debian GNU/Linux Services
- Documentation

Additional information about Debian GNU/Linux from HP is available at: http://www.hp.com/go/debian.

3. Installing Debian GNU/Linux 5.0

This section describes performing a new installation of Debian GNU/Linux 5.0 on ProLiant servers using the standard Debian.org Debian installer.

For additional help and information about installing Debian GNU/Linux 5.0, see the following:

- *Debian GNU/Linux Installation Guide* - http://www.debian.org/releases/lenny/installmanual
- *Debian GNU/Linux 5.0 Release Notes* - http://www.debian.org/releases/lenny/releasenotes
- Installation information and images - http://www.debian.org/releases/lenny/debian-installer

Before beginning, please assure that this installation is supported on your specific ProLiant hardware, as described in the *Hardware Support* section of this document.

To perform the installation:

1. Configure the server's drive arrays using the **ROM Configuration for Arrays** option (if applicable). When prompted, press the **<F8>** key during the **Power-On Self Test (POST)**, after the array controller has initialized. For full details, consult the *User's Guide* for your ProLiant server.

2. Configure the server using the **ROM Based Setup Utility (RBSU)**. The RBSU can be entered by pressing the **<F9>** key during the POST. For full details, consult the *User's Guide* for your ProLiant server.

3. If you have not already done so, obtain the Debian GNU/Linux 5.0 installation image for your system from the following location, and create an installation CD/DVD with it:

   http://www.debian.org/releases/lenny/debian-installer

4. Insert the Debian GNU/Linux 5.0 installation media into the CD/DVD drive and boot the system. The installation will begin and following prompt is eventually displayed:

   ```
   Press F1 for the help index, or ENTER to boot:
   ```

5. Follow the instructions as they are displayed on the screen to proceed with the installation. You can usually just press **Enter** in response to most of the displayed screen prompts.

   If you have any questions during the installation procedure, see the *Debian GNU/Linux Installation Guide* for further information:

   http://www.debian.org/releases/lenny/installmanual

4. Troubleshooting the Installation

This section describes common issues that might occur during installation using the Debian.org installer. Problem statements and resolutions are described in the following table. For additional information about Debian installation issues, go to the following website: http://wiki.debian.org/HP/ProLiant

Known Issue	Explanation / Workaround
Installer prompts for "missing firmware files". This error results in a failure to install the base system. If this error occurs, it is likely that the system is having problems reading the installation media.	For ProLiants that use the Broadcom NetXtreme II (bnx2) network controllers, you will be prompted to insert removable media that contains firmware files. These firmware files are available at: http://cdimage.debian.org/cdimage/unofficial/non-free/firmware/lenny/current/ **Note:** It is likely that the Debian community will provide installation media that already includes the firmware files at some point. Using such media will avoid the need to provide the firmware files externally during the install. Firmware-enabled media is not yet available as of this writing, but may have been made available since. If you choose to use such firmware-enabled media you should be able to skip the rest of this section. This firmware maybe used by unpacking either the firmware.tar.gz or firmware.zip file onto a USB key (or an external USB hard drive) and attaching it to the system when prompted. **Note:** It may take several minutes for the installer to probe for the external media. During this time the installer may appear to be hung, but it will eventually return to a menu. Once the menu reappears, you may remove the external media. **Important:** The USB storage device containing firmware files must be detached before allowing the installer to install the GRUB bootloader. Failure to do so may cause the installer to perform the GRUB installation on the USB storage device, resulting in an unbootable system. This procedure can also be carried out remotely using the iLO 2 virtual media applet. The remainder of this explanation is dedicated to this method. **Note**: This procedure requires the purchase of an "iLO 2 Advanced" license. To make the firmware files available during install using the iLO 2 virtual media applet, you must first create a virtual USB disk image. The following commands demonstrate a method for creating such an image on a Linux system. These commands assume that you have already downloaded the **firmware.tar.gz** file from the URL listed above into the current directory.

	# dd if=/dev/zero of=firmware.img ** **bs=1MB count=8 **# /sbin/mkdosfs firmware.img** **# mkdir mnt** **# mount firmware.img mnt -o loop** **# cd mnt** **# tar xfz ../firmware.tar.gz** **# cd ..** **# umount mnt** **# rmdir mnt** This will produce a firmware.img file that can be used as a "Local image file" for the "Virtual Floppy/USBKey" in the iLO 2 Virtual Media Applet. Use the "Connect" button to perform a virtual attach when prompted to insert firmware files by the Debian installer. **Important:** As with physical USB devices, you must also detach the "Virtual Floppy/USBKey" before allowing the installer to install the GRUB bootloader. This action can be performed by clicking the "Disconnect" button in the iLO 2 Virtual Media Applet.

Known Issue	Explanation / Workaround
System hangs after reboot after displaying "GRUB Loading stage1.5.", "GRUB loading, please wait..." or "Error 15: File not found" These errors result in an unbootable system and are known to occur when a USB storage device is attached during installation of the bootloader.	To get around this situation, you can reinstall the system, making sure all USB storage devices - including iLO 2 virtual USB devices - are detached before allowing the installer to install the GRUB bootloader to the hard disk. It is safe to reattach USB storage devices after installation has completed.

Known Issue	Explanation / Workaround
"Debootstrap error" occurs during base installation. This error results in a failure to install the base system. If this error occurs, it is likely that the system is having problems reading the installation media.	To get around this situation, you can do one of the following things: • Recreate (reburn) the installation media. This may or may not avoid the error. • Use the iLO virtual media option. Refer to the iLO user's guide (*Integrated Lights-Out User Guide*) for details about this option.

Known Issue	Explanation / Workaround
There is a discrepancy between the way	There is no workaround for this situation.

that logical disk size is reported by the Debian installer and certain SmartStart tools (such as ACU and ORCA). • The Debian installer reports logical disk size in terms of MB (megabyte) and GB (gigabyte). • ACU and ORCA report logical disk size in terms of MiB (mebibyte) and GiB (gibibyte). Therefore, when the Debian installer reports a disk size as "GB" and "MB", it means "GB" and "MB". However, when ACU and ORCA report a disk size as "GB" and "MB", they are actually providing the size in "GiB" and "MiB".	The Debian installer is technically correct by reporting logical disk size as MB (megabyte) and GB (gigabyte). ORCA and ACU are technically incorrect by using MB and GB when they are actually providing the logical disk size in MiB (mebibyte) and GiB (gibibyte). If necessary, you can convert between MB and MiB, or GB and GiB, as follows: $1MB = \frac{1000^2}{1024^2} MiB$ $1GB = \frac{1000^2}{1024^2} GiB$

Known Issue	Explanation / Workaround
dmesg output contains "Error: Driver 'pcspkr' is already registered, aborting..." The boot sequence attempts to load two different drivers for the integrated PC speaker.	This error message can be safely ignored. Debian provides two different drivers for the PC speaker and attempts to load both of them at boot time. The first driver (pcspkr) will successfully load. The second driver (snd-pcsp) will attempt to load and fail because the pcskr driver has already claimed the PC speaker device and this results in an error message. The snd-pcsp will remain unloaded and will not consume any system resources. The system can be configured to skip attempting to load the snd-pcsp driver, thereby preventing this error message, by executing the following commands as root: **# apt-get install alsa-base** **# echo "blacklist snd-pcsp" >> ** **/etc/modprobe.d/alsa-base-blacklist**

Known Issue	Explanation / Workaround
Debian 5.0 ('lenny') for i386 does not use all memory in systems with large amounts of memory (greater than 4GB). The kernels installed by default in Debian 4.0 for i386 do not support more than 4GB of memory.	To access the additional memory beyond 4GB, install a 64-bit kernel: **# aptitude install linux-image-2.6-amd64** A reboot of the system is required for this installation to take effect.

Appendix A

Choosing Between the AMD64 or i386 Ports of Debian

This section provides information to help you decide whether to install the AMD64 or i386 ports of Debian on your system.

AMD64

The AMD64 port provides a complete 64-bit userspace. If you require individual processes that use large amounts of memory (greater than 3GB), you should install the AMD64 port. There is limited support for running 32-bit binaries, but doing so increases the complexity of the system configuration.
For further details, refer to the following website: http://wiki.debian.org/DebianAMD64Faq

i386

The i386 port does not support 64-bit applications, but is compatible with many existing applications that do not yet have 64-bit versions. You should install the i386 port if you need to run these applications and do not require executing individual processes that use large amounts of memory (greater than 3GB).

Installing an Optimized Kernel (for i386 port only)

By default, the Debian Installer tries to install the most optimal kernel for your system. But there are times when you may want (or need) to install a more optimized kernel after the initial installation. This section will help you decide if you should select and install an alternate kernel.

Note: Debian provides some kernel images with additional features such as Xen (**-xen**) and Linux Virtual Server (**-vserver**). This section does not explicitly cover these images, although the information is also applicable to them.

There are three possible scenarios:

- If you are running the AMD64 port, there is only one generic kernel image, called 'amd64'. This kernel has been tested by HP and is compatible with the HP value-add software. See the capability matrix at http://hp.com/go/proliantdebian for specific configurations that have been tested. If you have installed the AMD64 port, you can ignore the rest of this section.

- If your system has less than 4GB of memory, the installer will have already selected the kernel that is most optimized for your system. In this case, you can skip this section, because there is no alternate kernel to install.

- If you are running the i386 port, and your system has greater than 4GB of memory, you will need to install one of the following optimized kernels to enable access to the additional memory:

  - **amd64**
    The amd64 kernel allows you to access more than 4GB of memory. This kernel does not require the use of "**pae**" to access the additional memory (greater than 4GB), and therefore does not have the performance penalty. Most ProLiants systems with more than 4GB of memory should use the amd64 kernel image.

  - **686-bigmem**
    The 686-bigmem kernel permits 32-bit systems to access more than 4GB of memory. This kernel uses a processor feature called "**pae**" that enables the large memory access, but comes with a performance penalty. This option should be selected for systems with greater than 4GB of memory that do not support 64-bit mode.
    Note: All systems in the capability matrix for Debian 5.0 ('lenny') support 64-bit mode

If your system does not list the 'lm' processor flag in the /proc/cpuinfo file and has greater than 4GB of memory, the 686-bigmem flavor should be used.