Installing Debian GNU/Linux 3.1 (2.6 Kernel)
for i386 and AMD64
on HP ProLiant Servers

How-To Guide

4th Edition
April 2007

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 3.1 (2.6 Kernel), codenamed 'sarge', for the i386 and AMD64 architectures on ProLiant Servers.

Important! If you are installing Debian GNU/Linux 3.1 on DL380 (G4) SCSI, DL585 (G1) SCSI, BL25p (G1) SCSI, or BL20p (G3) SCSI ProLiant servers, you have the option to use the Debian.org installer rather than the HP-provided installer. The Debian.org installer installs the standard Debian.org kernel package rather than HP's customized kernel package. If you choose to use the Debian.org installer, please refer to the installation and troubleshooting information provided in *Appendix A* of this document.

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. This document is located at the http://www.hp.com/go/debian website.   At this website, click on the **ProLiant servers** link at the bottom of the page, and then click the **Capabilities matrix** link.

Note that this installation provides support for the base ProLiant system; however, peripherals and plug-in cards are not supported.

2. Performing the Installation *(Using the HP-provided Installer)*

This section describes how to perform a new installation of Debian GNU/Linux 3.1 (2.6 Kernel) using the HP-provided installer.

If you are using the Debian.org installer, please refer to the installation information that is provided in *Appendix A* of this document instead of using the instructions in this section.

For additional help and full information about installing Debian GNU/Linux, see the *Debian GNU/Linux Installation Guide*, located at the following website: http://www.debian.org/releases/sarge/installmanual.

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

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)**, as follows:
    a. When prompted, press the **<F9>** key during the POST.
    b. Select **System Options** and set **Operating System** to "**Linux**".
    c. Press the **<F10>** key to save your changes, and exit the RBSU.
    d. For full details, consult the *User's Guide* for your ProLiant server.

3. If you have not already done so, download the Debian GNU/Linux 3.1 installation media (the netinst (network install) CD/DVD image) from http://www.hp.com/go/debian and place it on a CD or DVD. Information about using netinst is available at http://www.debian.org/distrib/netinst.

4. Insert the Debian GNU/Linux 3.1 installation media into the CD/DVD drive and boot the system.

Note: Alternatively, you can use the iLO Virtual Media option for the installation. Refer to the iLO user's guide (*Integrated Lights-Out User Guide*) for details about this option.

5. When the following prompt is displayed, press the **<Enter>** key:

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

Note: If you are using a serial console, refer to *Debian GNU/Linux Installation Guide* for information about booting the system.

6. Follow the instructions that are displayed on the screen to continue and complete the installation. See the *Debian GNU/Linux Installation Guide* for further information about the installation procedure.

2.1 Troubleshooting the Installation

This section describes common issues that might occur during the installation of Debian GNU/Linux, using the HP-provided installer.

If you are using the Debian.org installer, please refer to the troubleshooting information that is provided in *Appendix A* of this document.

Problem statements and resolutions are described in Table 2.1.   For additional Debian installation issues, go to the following website: http://wiki.debian.org/HP/ProLiant

Table 2.1 Known Issues

Known Issue	Workaround
Grub and LILO boot loader installations fail on ProLiant DL380G5 servers. The installation of this software exits with a **"fatal error"** message after the base installation. Grub installation fails if the partition that holds **/boot** extends past the first 512MB.	You can identify this situation as follows: 1. Select "**Execute a Shell**" in the main menu. 2. Run **#cat /target/tmp/grub***. If this results in the following message: `Error 18: Selected cylinder exceeds maximum supported by BIOS` Reboot the installer and create a separate **/boot** partition that resides within the first 512MB of your disk.
"**Debootstrap error**" occurs during base installation on ProLiant DL380G4 servers. 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.	Possible solutions/workarounds: • 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. • Netboot the installer, as described at the following website: http://www.debian.org/releases/stable/i386/ch04s06.html.en
Some AMD systems do not detect the NIC/Smart Array controller.	Try passing **pci=nommconf**, as described at the following website: http://h18004.www1.hp.com/products/servers/linux/k8-notes.html
Automatic partitioning detects the system's disk drive, but fails to partition it. The guided partitioning option "**use entire disk**" in the sarge installer may fail on very large logical disks (larger than 1TB).	It is possible to use the entire capacity of a very large disk, but the disk will have to be partitioned manually instead of with the guided partitioning option. Refer to the following website for further information and workaround suggestions concerning this situation: http://bugs.debian.org/cgi-bin/bugreport.cgi?bug=412624
In 64-bit Debian "Sarge" **cat /proc/cpuinfo** does not provide the correct cache size on certain configurations of systems with Xeon CPU(s). When this command is run on such a system, it returns *zero* (0 KB) as the cache size.	There is no workaround for this situation in 64-bit Debian "Sarge". In 64-bit Debian "Etch", **cat /proc/cpuinfo** returns the correct cache size. Refer to the following website for further information: http://wiki.debian.org/HP/ProLiant.

There is a discrepancy between the way 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".	There is no workaround for this situation. 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: $$1MB = \frac{1000^2}{1024^2} MiB$$ $$1GB = \frac{1000^2}{1024^2} GiB$$

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

You can obtain the latest additional Debian GNU/Linux information and value-add software downloads for your HP ProLiant server by going to the following HP internet location: http://www.hp.com/go/debian.

At this web page, click on the **ProLiant servers** link at the bottom of the page to access links for related information and downloads.

For example, to obtain downloads, do the following:

1. Click on the **ProLiant servers** link.
2. Click on the **Downloads** link.
3. Follow the directions on this webpage to obtain available software.

Appendix A - Installing on DL380 (G4), DL585 (G1), BL25p (G1), BL20p (G3) Servers *(Using the Standard Debian Installer)*

This section provides information that is specific to installing Debian GNU/Linux 3.1 using the standard Debian.org installer on the following ProLiant servers:

• DL380 (G4) SCSI
• DL585 (G1) SCSI
• BL25p (G1) SCSI
• BL20p (G3) SCSI

If you are installing Debian GNU/Linux 3.1 on one or more of these ProLiant servers, you should use the installation and troubleshooting information provided in this section.

A.1 Performing the Installation

This section describes performing a new installation of Debian GNU/Linux 3.1 (2.6 Kernel) using the standard Debian.org (non-HP) Debian installer.

For additional help and full information about installing Debian GNU/Linux, see the *Debian GNU/Linux Installation Guide*, located at the following website: http://www.debian.org/releases/sarge/installmanual.

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

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)**, as follows:
   a. When prompted, press the **<F9>** key during the POST.
   b. Select **System Options** and set **Operating System** to "**Linux**".
   c. Press the **<F10>** key to save your changes, and exit the RBSU.
   d. For full details, consult the *User's Guide* for your ProLiant server.

3. If you have not already done so, obtain the full Debian GNU/Linux 3.1 installation media from http://www.debian.org.

4. Insert the Debian GNU/Linux 3.1 installation media into the CD/DVD drive and boot the system.

5. The following prompt is eventually displayed:

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

   Depending upon your system, perform one of the following steps:

   - **For I386:**
     - If installing Debian 2.6 kernel for single processor - enter **linux26** on command line and press **<Enter>**
     - If installing Debian 2.6 kernel for multiple processor - enter **expert26** on the command line and press **<Enter>**

   - **For AMD64:**
     - If installing Debian 2.6 kernel for single processor, enter **linux** on the command line and press **<Enter>**

6. Follow the instructions that are displayed on the screen to continue and complete the installation. See the *Debian GNU/Linux Installation Guide* for further information about the installation procedure.

A.2 Installing an Optimized Debian 2.6 Kernel

After the installation is completed, it is recommended that you install a kernel flavor that is optimized for your hardware, according to the following examples:

- If your system has a single processor:
  # apt-get update
  # apt-get install kernel-image-2.6-686

- If your system has multiple processors:
  # apt-get update

```
# apt-get install kernel-image-2.6-686-smp
```

A.3 Controlling Upgrades

Debian GNU/Linux systems are configured (by default) to install software from the latest Debian release at http://www.debian.org. Therefore, if you upgrade your system (e.g. **apt-get update**, **apt-get upgrade**) after a new stable version of Debian/GNU Linux has been released, your system will automatically be upgraded to that new release.

You may want to consider avoiding a default upgrade from your current HP-supported release (Debian GNU/Linux 3.1) to a new Debian release, and manage the timing of an upgrade yourself. By controlling when upgrades occur, you can wait until HP has validated a new release before upgrading to it.

To avoid an automatic upgrade, and keep your system at Debian GNU/Linux 3.1 (sarge) until you explicitly decide to upgrade it, edit your **/etc/apt/sources.list** file as follows:

1. Open the **/etc/apt/sources.list** file on your server in a text editor.
2. Within this file, replace all occurrences of the word **stable** with the word **sarge**. For example:
    - *Original line:* deb http://http.us.debian.org/debian **stable** main contrib non-free
    - *Change to:* deb http://http.us.debian.org/debian **sarge** main contrib non-free
3. Save the modified **sources.list** file.
4. Run **#apt-get update**

A.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 Table 2.   For additional Debian installation issues, go to the following website: http://wiki.debian.org/HP/ProLiant

Table 2. Known Issues

Known Issue	Workaround
Installing the GRUB boot loader to the master boot record may cause 'Fatal error'.	Select **install the LILO boot loader on a hard disk** and select the default: **/dev/cciss/c0d0: Master Boot Record**
On servers with 2GB or more of memory, the i386 kernel flavor cannot access beyond the first 1GB of memory.	1. Enter the following command to see if your system is running the i386 kernel flavor: **uname –m** 2. To resolve the issue, refer to *Appendix A.2* for instructions about installing an optimized Debian 2.6 kernel flavor. 3. Choose the kernel image you want to install and reboot the system when completed.
Debian 3.1 sarge r3 installs NONSMP kernel even though the system has multiple processors (2.6 kernel default installation method).	To resolve the issue, refer to *Appendix A.2* for instructions about installing an optimized Debian 2.6 kernel.

"**Debootstrap error**" occurs during base installation on ProLiant DL380G4 servers. 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.	Possible solutions/workarounds: • 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.
Automatic partitioning detects the system's disk drive, but fails to partition it. The guided partitioning option "**use entire disk**" in the sarge installer may fail on very large logical disks (larger than 1TB).	It is possible to use the entire capacity of a very large disk, but the disk will have to be partitioned manually instead of with the guided partitioning option. Refer to the following website for further information and workaround suggestions concerning this situation: http://bugs.debian.org/cgi-bin/bugreport.cgi?bug=412624
In 64-bit Debian "Sarge" **cat /proc/cpuinfo** does not provide the correct cache size on certain configurations of systems with Xeon CPU(s). When this command is run on such a system, it returns zero (0 KB) as the cache size.	There is no workaround for this situation in 64-bit Debian "Sarge". In 64-bit Debian "Etch", **cat /proc/cpuinfo** returns the correct cache size. Refer to the following website for further information: http://wiki.debian.org/HP/ProLiant.
There is a discrepancy between the way 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".	There is no workaround for this situation. 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: $$1MB = \frac{1000^2}{1024^2} MiB$$ $$1GB = \frac{1000^2}{1024^2} GiB$$