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Deployment of Red Hat Linux 7.2 for Itanium™ Processor on ProLiant DL590/64 Servers

Abstract: In support of the Itanium processor family, Red Hat released the Red Hat Linux 7.2 for Itanium Processor operating system for Itanium-based servers in December 2001. This document describes the level of support available for the Red Hat Linux 7.2 for Itanium Processor operating system on the ProLiant DL590/64 server including:

- Recommended system configurations
- Supported software, storage options, and network adapters
- Recommended installation procedures

This document is intended to augment the documentation provided with the ProLiant DL590/64 server and the documentation provided with Red Hat Linux 7.2 for Itanium Processor. It is offered with the intent of enhancing the user's experience of Red Hat Linux 7.2 for Itanium Processor on the Itanium-based platform.

For the latest information, visit the following websites:

- ProLiant DL590/64 Product Marketing Site:
www.compaq.com/products/servers/proliantdl590
- ProLiant Linux Site:
www.compaq.com/linux1

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Deployment of Red Hat Linux 7.2 for Itanium™ Processor on ProLiant DL590/64 Servers
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Introduction to the Architecture

The Intel® Itanium™ architecture, upon which the ProLiant DL590/64 is built, is a dramatic departure from the IA-32 architecture. The Intel® Itanium™ processor and platforms are capable of using 64-bits of directly addressable memory and can execute Intel® Itanium™ instructions.

Apart from the processor enhancements, the supporting elements of the ProLiant DL590/64 platform provide a host of new features that make the ProLiant DL590/64 different from other members of the ProLiant family of servers. The following list highlights some of the more significant differences:

- Standard Basic I/O Services (BIOS) has been replaced with Extensible Firmware Interface (EFI)
 - EFI boot manager functions replace the old BIOS menu functions
 - EFI partition(s) on disks, CD-ROMs or floppies provide a means of storing components that support the EFI environment
- ROM is more intelligent in the selection of settings and defaults, reducing the effort and attention required by the system operator during initial setup
- Master Boot Record (MBR) boot devices have been replaced with GUID Partition Table (GPT) devices

Requirements

Compaq worked with Red Hat during the development phase of Red Hat Linux 7.2 for Itanium Processor to test daily software builds, to tune the OS, to build support for hardware features, and to provide continuous feedback and fixes.

Designed to support 64-bit operating systems, the ProLiant DL590/64 server is the ideal platform to support Red Hat Linux 7.2 for Itanium Processor. Default hardware configurations of the ProLiant DL590/64 server models and information about software supporting the Red Hat Linux 7.2 for Itanium Processor operating system are detailed in the following sections.

Default Hardware Configurations

Table 1 lists the default configurations of the ProLiant DL590/64 server models available for purchase.

Table 1. ProLiant DL590/64 default configurations

	Configuration 1	Configuration 2
Processors	2 x 733 MHz/2 MB (4 proc sockets)	2 x 800 MHz/4 MB (4 proc sockets)
Memory Boards	1 memory board (32 DIMM sockets) (64 DIMM socket capable with optional second memory board)	2 memory boards (64 DIMM sockets)
SDRAM	1 GB (4 x 256 MB)	4 GB (8 x 512 MB)
Memory Expansion¹	Multiples of 4 C100 v1.2 CL2 up to 32 GB	Multiples of 4 C100 v1.2 CL2 up to 64 GB
Hard Drives	Optional	Optional
Power Supply	1 (support for 3)	2 (support for 3)
System Power Module	1 (support for 3)	2 (support for 3)
Redundant Hot Plug Fans	Standard	Standard
Network Interface	Dual Port 10/100	Dual Port 10/100
RAID Controller	Embedded	Embedded
LS-120	Standard	Standard
CD – ROM	Standard	Standard
Form Factor	7U Rack	7U Rack

¹ Memory for the ProLiant DL590/64 must meet very tight specifications due to timing requirements of the memory support chipset used in the server. All memory used within the ProLiant DL590/64 must conform to those exact specifications. For this reason, Compaq does not support transferring memory modules from other non-Itanium platforms into the ProLiant DL590/64.

Supported Software

All Compaq support software and drivers that are supported for use on the ProLiant DL590/64 server are included in the Red Hat Linux 7.2 for Itanium Processor operating system, which may be ordered online at www.redhat.com/software/linux/7-2_itanium.html.

Future updates to Compaq support software will be provided for download at www.compaq.com/support/files/server/us/locOsCat/70.html.

Device Support for Red Hat Linux 7.2 for Itanium Processor

Red Hat Linux 7.2 for Itanium Processor is a 64-bit operating system with a true 64-bit kernel. Any code that executes in kernel mode, such as drivers, must be developed specifically to interface correctly with the 64-bit kernel. Therefore, drivers that were developed for any 32-bit versions of Red Hat Linux will not function properly under Red Hat Linux 7.2 for Itanium Processor.

Supported Storage Options

IMPORTANT: Providing support for storage options on the ProLiant DL590/64 requires drivers that have been ported to the 64-bit architecture. The 32-bit drivers used on other Compaq server platforms will not load or function properly on ProLiant DL590/64 servers. As a result, only the storage options displayed in Table 2 are supported for use in ProLiant DL590/64 servers. Attempting to install unsupported storage options and drivers into the ProLiant DL590/64 may render the system unusable.

Table 2 lists supported Compaq storage options and drivers needed to interface with Red Hat Linux 7.2 for Itanium Processor.

Table 2. Supported Compaq storage options

Option	Driver	Location
Compaq 64-bit/66MHz Dual Channel Wide Ultra 3 SCSI Adapter	aic7xxx	Red Hat CD
Compaq 64-bit/66MHz Single Channel Wide Ultra 3 SCSI Adapter	aic7xxx	Red Hat CD
Compaq Integrated Smart Array Controller	cpqarray ¹	Red Hat CD
Compaq Smart Array 5300 Controller	cciss ¹	Red Hat CD
Compaq Smart Array 532 Controller	cciss ¹	Red Hat CD
Compaq StorageWorks 64-bit/33 MHz PCI-to-Fibre Channel Host Bus Adapter	cpqfc	Red Hat CD
IDE CD-ROM		Red Hat CD
IDE LS-120 Removable Media Drive		Red Hat CD

¹ Driver is included in the install kernel.

Supported Network Interface Controllers

Table 3 lists Compaq network interface controllers supported for use with the ProLiant DL590/64 running Red Hat Linux 7.2 for Itanium Processor.

Table 3. Supported Compaq network interface controllers

Compaq NIC	Driver	Location
Compaq NC3123 Fast Ethernet NIC PCI 10/100 WOL	e100	Red Hat CD
Compaq NC3134 Fast Ethernet NIC 64 PCI Dual Port 10/100	e100	Red Hat CD

continued

Table 3. Supported Compaq network interface controllers *(continued)*

Compaq NIC	Driver	Location
Compaq NC3135 Fast Ethernet Module Dual (10/100 Upgrade Module for NC3134 and NC3131)	e100	Red Hat CD
Compaq NC6132 Gigabit Upgrade Module (1000 SX Upgrade Module for NC3134 and NC3131)	e1000	Red Hat CD
Compaq NC6133 Gigabit Module (1000 LX Upgrade Module for NC3134 and NC3131)	e1000	Red Hat CD
Compaq NC3133 Fast Ethernet Module (100FX Upgrade Module for NC3134 and NC3131)	e100	Red Hat CD
Compaq NC6136 Gigabit Server Adapter, 64-bit/66MHz, PCI, 1000 SX	e1000	Red Hat CD
Compaq NC7131 Gigabit Server Adapter, 64-bit/66MHz, PCI, 10/100/1000-T	e1000	Red Hat CD
Compaq NC7132 10/100/1000-T Upgrade Module for NC3134 and NC3131	e1000	Red Hat CD

Installation Procedures

To install Red Hat Linux 7.2 for Itanium Processor on the ProLiant DL590/64 so that it is fully supported by Compaq and Red Hat, first read the following sequence of steps completely and then follow them carefully.

Pre-Installation Checks

1. Verify the completeness and correctness of your hardware configuration before powering on your system.
 - a. Make sure that you are using only supported storage options (see Table 2).
 - b. Confirm that you are using only supported network interface controllers (see Table 3).
 - c. Ensure that you have not installed any memory that was not provided for use with Itanium-based platforms.
 - d. Make certain that you have installed some type of disk storage (not included with the system), either on the internal storage bays or as external storage.
 - e. Confirm that you have cabled the system correctly, according to instructions included with the ProLiant DL590/64 Setup and Installation Guide (included with the server).
 - f. Run the Compaq ROM-Based Setup Utility (RBSU) and set the OS type to Linux.

Configuration Selections

2. Insert the first Red Hat Linux 7.2 for Itanium Processor CD in the CD-ROM drive of the server. Boot the system.
3. Select your language preference. This language choice will be used on the screen throughout the installation setup. Click **Next**.
4. Select your keyboard and layout, and then click **Next**.

5. Setup your mouse.
 - a. Choose your mouse type, and check the **Emulate 3 buttons** checkbox, if you want to use your two-button mouse as if it had three buttons (by pressing both mouse buttons simultaneously).

Note: The third button is highly recommended for use with the X Window System.

- b. Verify all three buttons are working.
6. Select your installation type. The available options are workstation, server, laptop, custom, or upgrade. For the purposes of this paper, select the **Custom** radio button under the Install section.
7. Partition your hard disk by selecting the **Have the installer automatically partition for you** radio button and clicking **Next**.
8. Click **Yes** to initialize the drive.
9. Select **Remove all Linux Partitions on this system**. Check the **Review** checkbox, and click **Next**.
10. Click **Yes** to confirm the removal of existing Linux partitions. The DISK DRUID Utility window will be displayed. Click **Next**.
11. On the eth0 tab of the Network Configuration screen, do the following:
 - a. Choose whether or not you want to configure your IP address using DHCP.
 - b. By checking the **Activate on boot** checkbox, the network interface controller will start when the server boots. If you check the **Configure using DHCP** checkbox, ignore steps c and d.
 - c. Type in the **IP Address**, **Netmask**, **Network**, and **Broadcast** addresses in the appropriate windows, if needed. If you have a fully qualified domain name for the network device, type it in the **Hostname** window.
 - d. Type the **Gateway DNS** and **Primary DNS** addresses. (If applicable, type the **Secondary DNS** and **Ternary DNS** addresses as well.)
 - e. Click **Next**.
12. Choose the security level (High, Medium, or No firewall). For the purposes of this paper, select the **No firewall** radio button, and click **Next**.

The Additional Languages Support screen will be displayed with a default language selection of the language chosen in step 3.
13. Select additional languages or accept the default language, and click **Next**.
14. Select your time zone configuration.
 - a. On the Location tab, select the continent where the server resides.
 - b. On the UTC tab, check the **Use Daylight Savings Time (US Only)** checkbox, if the server resides in the United States.
 - c. Check the **system clock uses UTC** checkbox, if you don't want to use local time.
 - d. Click **Next**.
15. Set the root password and add users.

- a. Type the root password (must be at least six characters long) and confirm it.
- b. Click the **Add** button to add a new user, click **OK**, and click **Next**.

Note: Compaq recommends adding at least one user. This user is typically the system administrator.

16. Accept the default selections on the Authentication Configuration screen, and click **Next**.

Package Installation

17. Select individual packages to install by checking the **Select individual packages** checkbox, or check the **Everything** checkbox to install all available packages. Click **Next**.
18. On the Graphical Interface (X) Configuration screen, select **ATI RAGE XL** for the video controller, and select **8 MB** for the video card RAM. If you do not use the GUI, check the **Skip X Configuration** checkbox. Click **Next**.
19. To begin the installation, click **Next**. You will now see progress bars showing the packages you selected with their total progress, size, and summary as they are being installed.
20. Insert the second Red Hat Linux 7.2 for Itanium Processor CD, if prompted.
21. Select the manufacturer and model of your monitor, and click **Next**.

IMPORTANT: If your monitor does not appear on the list, select the most appropriate generic model available. Do not select a monitor similar to your monitor unless you are certain that the monitor you are selecting does not exceed the capabilities of your monitor. Doing so may damage your monitor.

22. On the Customize Graphics Configuration screen, select the color depth and screen resolution you prefer. Click the **Test Settings** button to try out your selections before proceeding.
23. Choose the default desktop environment (GNOME or KDE). For the purposes of the paper, select the **GNOME** radio button.
24. Choose the login type (Graphical or Text). Unless you have special needs, select the **Graphical** radio button, and click **Next**.
25. Click **Exit**. This step automatically ejects the CD from the CD-ROM drive before restarting the server.

Post-Installation Updates

26. In the EFI Boot Manager, press **Enter** to accept the default of Red Hat Linux. The system will run off the ELILO boot.
27. Type the root username, and press **Enter**. Then, type the root password, and press **Enter**. When the Start Here applet appears on the desktop, you may begin using the operating system and customize your system.
28. Configure the Netscape browser to access the Internet.

29. Download the *Health and Wellness Driver for Intel Itanium Based Systems & Compaq Integrated Management Log (IML) Viewer Application for Linux* package from www.compaq.com/support/files/server/us/locate/5660.html, and install the Health and Wellness Driver following the directions posted on the Web.

Appendix A—Compaq Web Resources

Table 4 lists the Internet links noted throughout this document as well as additional links that you might find helpful when investigating Compaq solutions for Linux.

Table 4. Compaq Web resources

Description	Web Address
Compaq ActiveAnswers gives you the benefit of our experience to help manage your system and reduce the time, risks, and complexity associated with deploying solutions.	www.compaq.com/activeanswers
Linux at Compaq offers industry-defining technology, break-through performance, high availability, and easy serviceability.	http://www.compaq.com/linux
ProLiant DL590/64 Product Marketing site provides product information about the ProLiant DL50/64 server.	www.compaq.com/products/servers/proliantdl590
ProLiant Linux website provides information regarding Compaq and Linux partnerships and solutions for ProLiant servers.	www.compaq.com/linux1
Server Software Download Center allows downloading of the latest support software, drivers, utilities, and agents and provides information about software enhancements and fixes.	www.compaq.com/support/files/server/us/index.html

Appendix B—Red Hat Web Resources

Throughout this paper, we have discussed Red Hat Linux 7.2 for Itanium Processor installation and requirements. For additional tools and information critical to your implementation process, visit the Linux Web resources listed in Table 5.

Table 5. Linux Web resources

Resource Description	Web Address
The Red Hat Linux 7.2 for Itanium Processor page lists product features and ordering information.	www.redhat.com/software/linux/7-2_itanium.html
The Official Red Hat Linux Customization Guide contains information on how to customize your Red Hat Linux system to fit your needs.	www.redhat.com/docs/manuals/linux/
Red Hat Tips, FAQs and HOWTOs contains documents to help you install, set up, and troubleshoot your Linux system.	www.redhat.com/apps/support/resources/
Red Hat Linux Hardware Compatibility List assists you in the selection of hardware.	www.redhat.com/support/hardware/
Red Hat Documentation & Online Resources are the same guides that come with Red Hat's boxed products.	www.redhat.com/docs/
Red Hat Press Center provides current and past press releases about Red Hat's products, services, and partnerships.	www.redhat.com/about/presscenter/
Red Hat Linux Errata contains the most recent information about important updates, fixes, and corrections for Red Hat Linux.	www.redhat.com/apps/support/errata/index.html