Support Notes for Red Hat Enterprise Linux AS v.4 Update 4 for HP Integrity Servers

HP Part Number: 5991-5518
Edition: 2

Legal Notices

Acknowledgments

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Support Notes for Red Hat Enterprise Linux AS v.4 Update 4

Announcement

HP has certified Red Hat Enterprise Linux (RHEL4) AS v.4 Update 4 for the Intel® Itanium Processor® (kernel 2.6.9-42.EL; glibc-2.3.4-2.25) on HP Integrity servers. For a list of the HP servers supported by RHEL4, see the Linux on Integrity certification matrix at the following Web site:

www.hp.com/go/lxintegritycert

IMPORTANT: The Red Hat Installation Guide is available on the Red Hat media that shipped with your server, or you can download it in PDF, RPM, or HTML format from the following Web site:

https://www.redhat.com/docs/manuals/enterprise/

Support Note Contents

Distributions Supported on HP Integrity Servers

You can order Red Hat Enterprise Linux AS v.4 Update 4 at the following Web site:

http://www.hp.com/go/softwaredepot

IMPORTANT: Do not discard the Red Hat registration card packaged with the Red Hat CDs or DVDs. To receive Red Hat updates and comply with HP support requirements, register the serial number on the card with Red Hat Network. See Registering Software and Getting Updates from Red Hat Network (page 7) in this document for more information.

Certification and Support Matrix

Information on the supported and certified versions of the Red Hat Enterprise Server Linux distribution for the HP Integrity servers can be found at the following URL.

HP recommends that customers review this certification and support information for their HP Integrity server prior to any direct download from the Red Hat Web site.

1. Go to the following URL:

   http://www.hp.com/go/integritylinux
2. Click the "Certification Matrices" link.
3. Click on the server name to obtain detailed product information, downloads, documentation, and specific certification information.

Using the HP Smart Setup CD to Prepare for Operating System Installation

Use the HP Smart Setup CD to prepare your system for installation of the Linux operating system. This CD contains the HP Smart Setup EBSU application, which assists with tasks such as configuring storage adapters, upgrading firmware, preparing a system hardware inventory, and installing diagnostics tools. After operating system installation, you can use the HP Management

CD to install additional utilities and tools such as HP system management software. For instructions, see Operating System Installation (page 6).

The HP Smart Setup CD ships with your system hardware and is also available for free download under the **Linux** link at the following Web site:

http://www.hp.com/go/integritylinuxessentials

Documentation

Red Hat provides its own installation guide for operating system installation. It is available on the Red Hat CDs or DVDs that shipped with your server, or you can download it in PDF, RPM, or HTML format from from the following Web site:

https://www.redhat.com/docs/manuals/enterprise/

Documentation for the HP Integrity Essentials Foundation Pack for Linux and the HP Smart Setup CD comes with your system. The *HP Integrity Essentials Foundation Pack for Linux User's Guide* describes how to use HP Smart Setup EBSU application to install RHEL4.

This document, along with the *Installing HP Insight Management Agents on Integrity Servers Running Linux* manual, is also available at the following Web site:

http://www.docs.hp.com/linux

Operating System Installation

Before installing Red Hat Enterprise Linux AS v.4 for the Intel® Itanium® Processor on your Integrity server, use the HP Smart Setup EBSU application.

IMPORTANT: Ensure you have the correct firmware version before installing Red Hat Enterprise Linux AS v.4.

1. Click on **Software & Driver Downloads** from the following Web page:

   http://www.hp.com
2. On the "Software & Driver Downloads" page, click the radio button preceding **Download drivers and software**, and enter your server model number in the **for product** text box.
3. On the "specify operating system" page, click **cross operating system (BIOS, Firmware, Diagnotics, etc.)**
4. If your server does not have the current firmware, download it from the "download drivers & software" page.

If your system came with Linux pre-installed, power on your server and configure it as prompted. The functionality provided by the HP Integrity Essentials Foundation Pack has already been applied.

Use the HP Smart Setup EBSU CD and the Linux Installer media to load the operating system files on the server. After installation, set up the system and update it with the latest firmware, drivers, and patches. For details about installation procedures, see the *HP Integrity Essentials Foundation Pack for Linux User's Guide*.

Recovering your operating system:

The recovery process of your factory-installed operating system is a "cold installation" (installation from the distribution media). For instructions on this type of recovery, see Chapter 3 of the *HP Integrity Essentials Foundation Pack for Linux User's Guide*. This document is available from the following Web site:

http://www.docs.hp.com/linux

Downloading RHEL from the Red Hat Web Site

You can choose to download the RHEL operating system directly from the Red Hat Web site and not receive a media kit from HP containing the software. This scenario occurs when the media option **AJR** is deselected from the order. (The media kit option is always selected by default.)

It is necessary to register at the Red Hat Web site prior to download. Registration requires the activation code that each customer receives from HP when ordering either RHEL.

You can download RHEL for each available platform as four CD ISO images or one DVD ISO image.

Use the following procedure to download RHEL and create the installation media:

1. Register and log in at the following Red Hat Web site:

   www.redhat.com/rhn

2. Click on **channels** and then select **Red Hat Enterprise Linux AS (v.4 for 64–bit Intel Itanium)** .
3. Select **Downloads** and then download the ISO images of install, compatibility and source disks

   Files with **ia64** in the name are for the Itanium platform.

4. Create the CDs or a DVD from the ISO images.

IMPORTANT: Create the CDs or DVD using the contents of the ISO images. Do not create the CDs or DVD by burning the .iso files themselves to CD or DVD. For example, if you are using K3b to burn a CD, click `Tools>CD>Burn CD Image`, select the .iso image, then click **Burn**.

Registering Software and Getting Updates from Red Hat Network

To ensure you have the most current version of software including patches for bug fixes, use the following instructions to obtain updates from Red Hat Network. See the following Web site:

http://www.redhat.com

It is possible that pre-installed software versions is not be up to date.

1. Install Red Hat on your system and reboot.
2. Log in as root on the console.
3. Using the registration card number that came with your Red Hat Enterprise Linux CDs/DVDs, run the `rhn_register` command to register your system and create an account with Red Hat Network.

   Communication between your system and Red Hat Network server begins with confirmation of your installed software packages, and optionally, your hardware. Red Hat Network server notes any necessary updates and sends e-mail to the Red Hat administrator to forward the packages to your system when you request an update.

4. To update your system, run the `up2date` command on the console to initiate the process with Red Hat Network. Then follow the instructions Red Hat provides.

NOTE: Red Hat ensures all information transferred is treated as private and confidential. By default, all data sent and received over the network uses the secure sockets layer (SSL).

Red Hat provides more detailed information on the update process in its documentation.

Known Issues

1. HP does not recommend using the drivers in the RHEL4 Update 4 installation for the A6826A, A7538A, AB379A, AD167A, orAD168A cards.

   To obtain the drivers that HP supports for the A6826A, A7538A, AB379A, AD167A, AD168A, AB429A, AD300A, AE311A, A8002A, or A8003A cards, respectively:

   a. From the following Web site, click on the "Driver Downloads" link:

      http://www.hp.com

   b. Click the radio button preceding "Download drivers and software" on the **Software & Driver Downloads** page, enter **`A6826A`** , **`A7538A`**, **`AB379A`**, **`A167A`**, **`A168A`**, **`AB429A`**, **`AD300A`**, **`AE311A`**, **`A8002A`**, or **`A8003A`** in the text box.

   c. Click "Red Hat Enterprise Linux 4 (Itanium)" under the "select operating system" heading on the **specify operating system** page.

   d. Scroll down the **download drivers and software** page for your specified card, and click the download button for the required driver.

2. HP recommends backing up all data and doing a cold install of Red Hat Enterprise Linux AS v. 4 if upgrading from AS v. 3 or v. 2.1.
3. If the Red Hat kernel detects a VGA card, it defaults to a VGA display. To use serial console, use the EFI Boot Manager to select the serial device as the primary (or only) console device.
4. If you are attempting a network installation, ensure no media is in the drive because Anaconda's default is to install from media if it is available.
5. The installation of Red Hat Enterprise Linux AS v. 4 may fail if using the autopartition function on a server with multiple disks. If you encounter this problem, remove all disks from the server except those on which you are installing Red Hat Enterprise Linux AS v. 4. Replace the removed disks when operating system installation on the targeted disks is complete. You may then need to edit the device file name of the `/boot/efi` mount point in the `/etc/fstab` file because the device file may have changed when the disks were replaced.
6. If you have Red Hat Enterprise Linux AS v. 3 installed on a disk partition on your server and want to install Red Hat Enterprise Linux AS v. 4 on another, you must change the name of your boot manager entry on the Red Hat Enterprise Linux AS v. 3 partition because v. 3 and v.4 use the same name for the boot manager entry.

   There is no rename function, so from the Boot Option Maintenance Menu in the EFI Boot Manager, add another boot entry with the same boot parameters as the existing Red Hat Enterprise Linux AS v. 3 entry, but give it a different name.

7. If you are transitioning to Red Hat Enterprise Linux AS v 4, note that the load order of storage and networking drivers in this software release is the reverse of the order in Red Hat Enterprise Linux AS v. 3 and v. 2.1. The numbers on the device file names for your NICs will appear in the opposite order to which you have become accustomed to seeing them.
8. SCSI errors and resets may cause system failures.

   SCSI errors and resets for any reason may cause system failures. For example, if your disks have a problem such as a parity or disk error that causes a SCSI reset, the system may fail. Combining a Seagate drive with the ds2100 disk carrier causes electrical problems on the SCSI bus and subsequent reset attempts that also result in system failure. Do not use Seagate drives with this disk carrier.

9. If using an HP Procurve 4108gl switch with a heavily loaded system, you may experience intermittent data truncation with FTP transfers through the network. To avoid this problem:

   a. Connect to the HP Procurve 4108gl switch using telnet or serial console and login.

   b. From the switch command line interface, enter **`config`**.

   c. Enter **`no int all lacp`**.

10. The Red Hat Enterprise Linux AS v. 4 kernel supports maximum memory of 2 TB, which is also supported by HP.
11. No support for uncertified `.rpm` packages.

    If you add uncertified `.rpm` packages to the operating system, the operating system will not be supported by Red Hat. Red Hat supports only `.rpm` packages bundled in supported Linux distributions for Integrity servers and official Red Hat Updates for those distributions. HP supports the Linux software it distributes.
12. Red Hat Enterprise Linux AS v. 4 does not ship or install a kernel-source rpm with the binary installation CDs or DVDs. If you want to modify or view the kernel configuration, you must extract `kernel-2.6.9-42.EL.src.rpm` from the source `.rpm` packages. Refer to the Red Hat Enterprise Linux AS v. 4 Release Notes for instructions.

NOTE: These instructions are in the file `RELEASE-NOTES-en`, but not in the file `RELEASE-NOTES`.

13. 32-bit emulation is not automatically installed with Red Hat Enterprise Linux AS v. 4. To obtain this functionality, install the ia32el package from the Intel Itanium Extras CD. Then install any additional compatibility binaries you need from the 32-bit Compatibility Layer Binaries CD. Refer to the Red Hat Enterprise Linux AS v. 4 Release Notes for instructions.
14. Correctable platform events such as single-bit memory errors are routinely logged into NVRAM. To ensure errors are logged into the `/var/log` file, configure the `salinfod` file to start at boot, executing the following commands as root:
    a. Enter `cd /etc/init.d`.
    b. To configure, enter `chkconfig salinfod on`.
    c. To start `salinfod` without rebooting, enter `service salinfod start`.
15. If you use `cdrecord` to burn a CD, you may need to eject the CD and reinsert before you can mount it.
16. This issue affects Linux running on the following systems: rx1600, rx1620, rx2600, rx2620, rx3600, rx4640, rx6600, rx7620, rx8620, and Superdome.

    The Management Processor UART on these systems does not supply the Carrier Detect signal. This causes applications to hang when opening the UART device, waiting for Carrier Detect, unless they use the O_NDELAY or O_NONBLOCK flag.

    For example, `echo foo > /dev/ttyS0` hangs.

    This is usually not a problem because `/dev/ttyS0` is usually used as a console, the agetty process opens it with O_NONBLOCK, and processes spawned by agetty generally inherit the already-opened device.

    However, there are some cases where the device must be opened again, and applications will observe the hang.

    You may also need to add the `-L` option to the agetty line in the `/etc/inittab` file as show below to resolve the problem:

    ```
    co:2345:respawn:/sbin/agetty -L ttyS0 9600 vt100-nav
    ```

    After editing the file, signal the init process to re-read the inittab file with the following command:

    ```
    kill -HUP 1
    ```

    If you are logged in to the console, then exit and log in again to restart the agetty.
17. Before booting Red Hat Enterprise Linux AS v.3 or v.4 on an nPartition on an rx7620, rx8620, or Integrity Superdome server, your ACPI configuration value must be set to `single-pci-domain acpi` flag to eliminate any bus address conflicts and ensure all I/O

slots have a unique address. Although your server should have the correct setting already, confirm it before proceeding and change it if necessary using the following instructions:

a. From the EFI shell, enter `acpiconfig`.

b. You should see the following output:

```
acpiconfig settings: single-pci-domain
```

If you see something different, continue to the next step to reset the value. Otherwise, stop here.

c. To set the ACPI configuration value to `single-pci-domain`:

1. From the EFI shell, enter `acpiconfig single-pci-domain`.

2. You should see the following output:

```
single-pci-domain settings have been enabled. A reset is
required for the settings to take effect.
```

d. Enter **`reset`**.

18. If you want rx7620, rx7640, rx8620, or rx8640 server hardware to power off when the `shutdown -h` comand or `poweroff` command is issued, run the `acpiconfig enable softpowerdown` command from the EFI shell and reset the nPartition to make the ACPI configuration take effect.

The normal behavior on these servers is for an nPartition to be made inactive (all cells are in a boot-is-blocked state) when `shutdown -h` or `poweroff` is issued from the Red Hat Linux command line. This behavior is established with the `acpiconfig disable powerdown` setting, which is the normal setting for the single-pci-domain ACPI configuration.

On HP Integrity Superdome servers, an nPartition is always made inactive when halted from the operating system (for example, after `shutdown -h`), and this behavior cannot be changed.

When `softpowerdown` is enabled on an rx7620, rx7640, rx8620, or rx8640 server, if one nPartition is defined in the server then halting the operating system powers off the server cabinet (including all cells and I/O chassis). On an rx7620 or rx8620 server with multiple nPartitions, halting the operating system from an nPartition with `softpowerdown` enabled causes only the resources on the local nPartition to be powered off. You can run the `acpiconfig` command with no arguments to check the current setting and the `softpowerdown` setting; however, softpowerdown information is displayed only when different from normal behavior.

To power on hardware that has been powered off, use the `PE` command at the management processor command menu. To make an inactive nPartition active, use the management processor `BO` command to boot the nPartition past the boot-is-blocked state.

19. This note pertains to Linux running on the following systems: rx8620 and Superdome sx1000 and sx2000. On the rx8620 and Superdome sx1000, the maximum number of I/O chassis that can be supported per hard partition (also called nPartition) is two. On Superdome sx2000, the maximum number of I/O chassis that can be supported per hard partition is six.

20. In a text-based installation, the partition displays from either autopartition or disk druid will display filesystems of 1 terabyte or greater without a size suffix such as M or G. These filesystems will appear to be much smaller than they really are.

21. Red Hat Enterprise Linux can be preloaded on the HP Integrity server disk in the factory prior to customer shipment. In the event of a system disk failure, the recovery process of this "factory preloaded OS image" is a "cold install" directly from the Red Hat media kit or the Red Hat Network. For additional instructions on installing Red Hat Enterprise Linux on an Integrity server, consult the *HP integrity Essentials Foundation Pack for Linux User's Guide*.

22. Output from the Management Processor (MP) serial ports may hang due to a failure to reassert a transmit empty interrupt in the MP UART. When used as a serial console, this output hang may lead to a hang during Linux boot. This condition may occur on any low-end Integrity system using the MP console port as the Linux system console. This problem does not exist on mid-range and high-end Integrity platforms.

    When rebooting the system, the user should either manually confirm the system has booted, or use scripts to track the system boot on the serial console and automatically intervene as necessary. The only intervention required to continue the boot process is to send a character to produce a receiver interrupt on the console UART (for example, pressing a key). Note that while experiencing this console hang is rare, it can happen multiple times on the same boot cycle.

23. Installation to a software RAID 6 volume may result in a kernel panic. If this occurs, try using a different RAID type such as RAID 5.
24. The `cdrecord` program may hang when burning a CD-RW disk with unsupported media using certain models of CD/DVD-ROM Combo and DVD+RW drives shipped in rx1600, rx1620, rx2600, rx2620, and rx4640 servers.

    Use only approved HP CD-RW media to prevent burn hangs. Try different brands of media if HP media is not available.

25. The ELILO bootloader can pass command-line options to the Linux kernel. The `max_addr=` and `mem=` options limit the amount of memory used by the kernel.

    Some versions of the kernel handle these arguments incorrectly, resulting in an MCA that crashes the system during boot. If the system boots successfully, there is no risk of a crash due to this problem.

    Booting with `max_addr=` or `mem=` is sometimes useful for debugging problems, but is not a tested feature. A similar effect can be achieved by deconfiguring (with the EFI `dimmconfig` command) or physically removing DIMMs.

26. This issue affects RHEL4 U3 and RHEL4 U4 on Itanium systems with more than 64 CPU cores or threads.

    The standard RHEL4 Itanium kernel supports up to 64 CPUs. RHEL4 can be installed on a larger system, but only 64 CPUs will be used.

    Each thread on each core counts as a CPU for this purpose. Configurations with more than 64 cores or 64 threads require the largesmp kernel in order to use all the threads.

    The following table shows the maximum CPU core and thread configurations for sx2000-based systems. If CPU threads are disabled, the Cores column applies. If threads are enabled, the Threads column applies.

Cells	CPU Sockets	Cores	Threads (optional)
1	4	8	16
2	8	16	32
4	16	32	64
5	20	40	80
8	32	64	128
9	36	72	144
16	64	128	256

    rx7640 and rx8640 systems are limited to two and four cells, respectively, so they never need the largesmp kernel.

Integrity Superdome systems with five or more cells (threads enabled), or nine or more cells (threads disabled) need the largesmp kernel.

A standard RHEL4 installation works even when more than 64 CPUs are present, but ignores extra CPUs. After the installation, manually install the largesmp kernel. For RHEL4 U4, this is the command:

```
# rpm -i RedHat/RPMS/kernel-largesmp-2.6.9-42.EL.ia64.rpm
```

A reboot is required after installing the largesmp kernel.

If you want to enable more than 64 CPUs enabled on your Integrity Superdome/sx2000, you must install the package named `kernel-largesmp-2.6.9-42.EL.ia64.rpm`. This file is located on binary CD #2 of the set of RHEL4 U4 installation media.

Use The following set of commands to mount the CD and install the media. These examples assume that the device file used is `/dev/cdrom`:

```
[root@superdome]# mkdir /tmp/mnt
[root@superdome]# mount /dev/cdrom /tmp/mnt
[root@superdome]# rpm -ivh
/tmp/mnt/RedHat/RPMS/kernel-largesmp-2.6.9-42.EL.ia64.rpm
[root@superdome]# umount /tmp/mnt
```

Alternatively, if you have downloaded the RHEL4 U4 ISO images from the Red Hat Network (RHN), you can loopback-mount the ISO image for CD. To perform this, replace the previous `mount` command with the following:

```
[root@superdome]# mount -o loop RHEL4-U4-ia64-disc2.iso /tmp/mnt
```

```
Installing the kernel-largesmp package creates a new elilo.conf boot-stanza in the file /boot/efi/efi/redhat/elilo.conf:

image=vmlinuz-2.6.9-42.ELlargesmp
        label=2.6.9-42.ELlargesmp
        initrd=initrd-2.6.9-42.ELlargesmp.img
        read-only
        append="root=LABEL=/"
image=vmlinuz-2.6.9-42.EL
        label=linux
        initrd=initrd-2.6.9-42.EL.img
        read-only
        append="root=LABEL=/"
```

However, the default boot kernel is still the original RHEL4 U4 kernel (2.6.9-42.EL); this can be seen when examining the `default=` line in `elilo.conf`:

```
default=linux
```

The "linux" label corresponds to the boot stanza with the 2.6.9-42.EL kernel. To make the RHEL4 U4 largesmp kernel the default boot kernel, this line should read as follows:

```
default=2.6.9-42.ELlargesmp
```

NOTE: It may be convenient to rename the label `2.6.9-42.ELlargesmp` to something shorter and easier to remember, such as `linux-large` or `largesmp`.

27. Due to a bug in the RHEL4 Update 4 installation routines, the wrong driver is loaded for the following HP fibre-channel host bus adapters:
    - AB429A and AB379A QLogic 4 Gb/s PCI-x HBAs
    - AD300A and AE311A Qlogic 4 Gb/s PCI-express HBAs
    - 403619-B21 2-port 4Gb FC mezzanine adapter for BL860c blade server

    This bug results in a nonfunctioning HBA during and after installation, and thus Boot from SAN cannot be performed.

    This problem affects installation of RHEL4 Update 4 onto storage connected to these devices on all supported Itanium servers.

    Use the following procedure as a workaround.

The elilo boot loader is the IA-64 initial program loader that starts the Linux kernel (both for installations and post-install). Normally, systems are configured to automatically boot without any user intervention. This workaround around requires user intervention as follows.

During installation, when the system prints the **ELILO:** prompt, you must enter a string to override the default boot parameters. The loader allows you two seconds to start typing the string or the system will proceed to boot using the default values. The following string should be entered at the prompt:

```
ELILO: linux nostorage
```

If you are installing from a serial console, add **console=ttyS0** , as in the following example:

```
ELILO: linux nostorage console=ttyS0
```

Booting in this fashion causes the Red Hat installer to only load device drivers for discovered network interface controllers (NICs) and CD or DVD+RW drives, but to not load device drivers for any other discovered storage HBAs. Later you are asked if you want to add devices beyond these. Answer the question **Add Device**.

If you have these specific I/O cards, you should load these storage device drivers in the following order, as they appear in the Red Hat installer driver list. You can specify drivers for devices that are not in the system, so if in doubt, load them all:

1. Compaq Smart Array Controllers (cciss)
2. Symbios 53C896 or 53c10xx (sym53c8xx)
3. LSI Logic Fusion MPT SAS Driver (mptsas)
4. LSI Logic Fusion MPT SCSI Driver (mptspi)
5. Qlogic 2400 (qla2400)
6. Qlogic 2300 (qla2300)
7. Emulex FC Controller (lpfc)

When you have loaded the appropriate drivers, you can then select the **Done** option and proceed with the installation as normal.

28. Ethernet connections may not work properly on BL860c blade servers running Linux with the Ethernet Pass-Thru module. The standard Linux driver (tg3) does not autonegotiate properly to secure the connection.

To fix this problem, HP has qualified a special version of the tg3 driver, which can be downloaded from the drivers area of `www.hp.com`. Detailed installation instructions are included in the documentation package that is posted with the driver. The fixed driver will be included in the follow-on Red Hat Linux distributions: RHEL 4.5 and RHEL 5.1.

Even with the fixed tg3 driver the system may not establish a link 100 percent of the time because of a hardware problem. This is an issue that manifests itself on Linux and does not affect other operating systems. Until this issue is resolved, if the system does not establish a link, then simply retry the Ethernet operation that failed.

29. System panics may occur on Integrity servers running Linux that have fibre channel (FC) storage arrays directly connected.

If you plan to connect FC storage to Integrity Servers running Linux, you must connect through a FC switch. For the BL860c Blade servers, customers must use either the FC switch module (AE370A/AE371A/AE372A) or an external FC switch.

30. This problem is specific to the LSI1068 SAS I/O controller in the rx2660 and BL860c.

The mpt driver included in RHEL4 U4 does not have the necessary agent components required by HP System Insight Manager.

To fix this problem, HP has qualified a special version of the mpt driver, which can be downloaded from the drivers area of `www.hp.com` .

Printed in the US