



Hewlett Packard
Enterprise

Technical white paper

Red Hat Enterprise Linux 7 Operating System for HPE ProLiant servers



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Abstract

This white paper provides the information you need to install Red Hat® Enterprise Linux® 7 server operating system on HPE ProLiant servers. Key topics addressed in this paper include:

- Supported configurations on HPE ProLiant servers
- Recommended system configuration and server platforms
- Supported software, storage options, and network adapters
- Procedures for installations

Red Hat provides Red Hat Enterprise Linux 7 in the following architectures:

- AMD 64/Intel® 64

Note

To obtain an evaluation version of the Red Hat Enterprise Linux 7 operating system (OS), refer to the following Red Hat website: access.redhat.com/downloads.

A paid subscription is required for downloading from the Red Hat Software and Download Center. However, you can request a free evaluation subscription at the same site.

This link and other Red Hat links provided in this paper will take you outside the HPE website. HPE does not control and is not responsible for information outside [hpe.com](https://www.hpe.com).

Introduction to Red Hat Enterprise Linux 7

Red Hat Enterprise Linux 7 is the newest generation of the Red Hat Enterprise Linux OS. In this release, Red Hat integrates improvements across the server, systems, and overall Red Hat open source experience. The improvements and enhancements include updates to virtualization; greater scalability and efficiency; environmentally sustainable IT; and much more. For a complete list of improvements, enhancements, and fixes, refer to the Red Hat Enterprise documentation at: access.redhat.com/site/documentation/.

New features

Discontinued 32-bit support

With the Red Hat Enterprise Linux 7 release, 32-bit support is no longer available. The new version of the OS will support installations on 64-bit architectures only. Applications will still run with compatibility libraries. If you require 32-bit support, you should continue to use Red Hat Enterprise Linux 6.

Discontinued cciss storage driver

The cciss storage driver, which was part of earlier versions of Red Hat Enterprise Linux, is discontinued in the Red Hat Enterprise Linux 7.0 release. The cciss and hpsa storage drivers existed in Red Hat Enterprise Linux 6; with the latest release of the OS, the hpsa driver will replace the cciss driver, which was based on block technology for HPE Smart Array Controllers.

The hpsa driver is a SCSI-based driver for the latest controllers, such as HPE Smart Array Controllers. As a SCSI-based driver, the hpsa driver delivers enhanced capabilities by using tools available through the SCSI interface. For example, the hpsa driver presents logical disk devices in the standard SCSI namespace, providing greater compatibility with system tools and utilities designed to work with SCSI storage.

The removal of the cciss driver means that older HPE Smart Array Controllers (before ProLiant G6) are no longer supported in Red Hat Enterprise Linux 7. All future Smart Array Controllers will use the hpsa driver, with only one exception: the Dynamic Smart Array controllers will require a special driver available from HPE.

HPE Smart Array Controller models no longer supported in Red Hat Enterprise Linux 7 include: P400, P400i, P800, E200, E200i, P700m, 6400, 641, 642, and 6i.

For more information about the hpsa driver, refer to the document titled, "Migrating to hpsa: A SCSI-based Linux device driver for HPE Smart Array Controllers."



Update to systemd/udev

Red Hat Enterprise Linux 7 [server operation system](#) includes an update to systemd/udev, which offers methods for consistent and predictable device naming for network interfaces.

Traditionally, network interfaces in Linux are named ethn (such as eth0). As such, modern server platforms with multiple network adapters often present non-deterministic and counterintuitive naming of these network interfaces. In many cases, the names do not correspond to actual labels on the chassis.

With this update in Red Hat Enterprise Linux 7, assigning fixed names based on firmware/topology/location information is fully automated and fully predictable. The name remains fixed, even if hardware is added or removed. In addition, the broker hardware can be replaced seamlessly, a feature that was generalized the scheme pioneered by “biosdevname” in Red Hat Enterprise Linux 6.

Recommended ProLiant server platforms

The following tables list the minimum system, storage, and virtualization memory requirements (as determined by Red Hat) for installing Red Hat Enterprise Linux 7 on HPE ProLiant servers. Current minimum information can be found at access.redhat.com/articles/rhel-limits.

Minimum system requirements

Table 1. Memory requirements

AMD 64/Intel 64	
Minimum	1 GB
Recommended	1 GB + 1 GB per logical CPU

Table 2. Storage requirements

AMD 64/Intel 64	
Minimum	10 GB
Recommended	20 GB

Table 3. Virtualization memory requirements

AMD 64/Intel 64	
Minimum	2 GB
Recommended	2 GB for host + at least 512 MB per guest

Supported configurations

If your server meets the recommended system requirements established by Red Hat, then Red Hat Enterprise Linux 7 should install and run on any HPE server listed in the “[Recommended system configuration](#)” section of this document.

Recommended system configuration

This section lists the recommended system configurations established by Red Hat for Red Hat Enterprise Linux 7 bare-metal installations, as well as those supported by HPE. For information about installing Red Hat Enterprise Linux 7 in a virtualized environment, please refer to the Red Hat Enterprise [Virtualization software](#) documentation at the following Red Hat website: access.redhat.com/site/documentation/.



Note

Before installing Red Hat Enterprise Linux 7, update the corresponding iLO firmware as follows:

iLO 2	2.01 (or later)
iLO 3	1.10 (or later)
iLO 4	1.01 (or later)

Important

To help ensure successful installation and use of Red Hat Enterprise Linux 7 on your HPE ProLiant server, comply with the system requirements recommended in this white paper, and refer to the Red Hat documentation at: access.redhat.com/site/documentation/.

Do not use this white paper as the sole source of installation information.

For the most recent supported hardware configurations, refer to the following HPE Servers Support and Certification Matrices website: hpe.com/servers/rhelcert.

You can also refer to the Red Hat Ecosystem page website: access.redhat.com/ecosystem/.

To determine the required ROM version and the supported HPE ProLiant servers, refer to the following web resources for assistance:

- HPE software and drivers: h20565.www2.hpe.com/portal/site/hpsc/public/
- Red Hat on HPE ProLiant support matrix: hpe.com/servers/rhelcert

Supported components for HPE ProLiant servers

Software drivers

HPE recommends using the drivers contained in the Red Hat Enterprise Linux media, when applicable. Other software and firmware smart components required for HPE-specific customers are provided through Service Pack for ProLiant (SPP).

The SPP replaces the ProLiant Support Pack (PSP) and Smart Update Firmware DVD. The SPP provides the HPE ProLiant server and blade server drivers, utilities, and management agents previously available from the PSP. The SPP also includes firmware previously available on the Smart Update Firmware DVD.

The SPP ISO includes:

- A boot environment
- Smart Update Manager (SUM), the SPP deployment tool
- Driver, software, and firmware components for HPE ProLiant servers and blade servers

You can find Service Pack for ProLiant documentation at the following website:

h17007.www1.hpe.com/us/en/enterprise/servers/products/service_pack/spp/index.aspx

Overview information about SPP downloads and the current downloadable version are available from the Service Pack for ProLiant website:

hpe.com/us/en/product-catalog/detail/pip.5104018.html



Storage, tape, and network options

For a list of supported [HPE ProLiant](#) options—such as Server Smart Arrays, NICs, tapes, and SCSI Controllers—please refer to the QuickSpecs for the supported server. You can find QuickSpecs at hpe.com/info/quickspecs.

HPE can provide updated NIC drivers in the SPP as needed. HPE-branded drivers are not available in the Red Hat Enterprise Linux 7 distribution. However, corresponding NIC drivers from Intel, Broadcom, Emulex, QLogic, and Mellanox are in the distribution, and you can use them instead.

Red Hat Enterprise Linux 7 installation for 64-bit architectures on ProLiant servers

Red Hat Enterprise Linux 7 can be installed in numerous ways—from local media, remote media via HPE Integrated Lights-Out Virtual Media, and through a network-based NFS or PXE server. This white paper provides instructions for installing the OS from local media and from a PXE network connection.

To further streamline deployment, HPE introduces intelligent provisioning—an essential single-server deployment tool embedded in HPE ProLiant Gen8 servers. Intelligent provisioning simplifies HPE ProLiant server setup, providing a reliable and consistent way to deploy HPE ProLiant server configurations. Additional information is available at hpe.com/info/intelligentprovisioning.

Preinstallation tasks

To prepare for installation, ensure that:

- The server selected for installation is a supported platform. You can verify this information by referring to the Red Hat Enterprise Linux support matrix at h17007.www1.hpe.com/us/en/enterprise/servers/supportmatrix/redhat_linux.aspx (click **Red Hat Enterprise Linux [RHEL]** under **Support & Certification Matrices**).
- At the same website, examine **Minimum Supported Red Hat Updates** for HPE ProLiant Servers and related technical exceptions by clicking **Red Hat Enterprise Linux (RHEL)** under **ProLiant Technical Exception Matrices**.
- For information about other options added to the server for the supported HPE ProLiant or BladeSystem server Smart Arrays, NICs, and SCSI Controllers, refer to the supported server's HPE QuickSpecs at: hpe.com/info/qs/.
- Obtain the latest ROM from the HPE Business Support Center website: hpe.com/info/bizsupport.
- Update to the latest firmware and options for the server. Download the SPP from the HPE Software Delivery Repository website at: downloads.linux.hpe.com/SDR.
- You can find instructions for installing the SPP in the “[Installing the Service Pack for ProLiant](#)” section of this white paper.
- Use the ROM-Based Setup Utility (RBSU) to set the date/time and configure the boot controller order (if necessary).
- Decide on array type: software or hardware.
- Configure the RAID settings for the server. HPE recommends using the Array Configuration Utility to complete this task. Information about using this utility, as well about other methods available for configuring RAID settings, is available in the [Configuring Arrays on HPE Smart Array Controllers Reference Guide](#). You can also use a new tool called HPE Smart Storage Administrator (HPE SSA), which offers a single interface for quickly setting up, configuring, and managing the HPE Smart Array Controllers and the HPE SAS Host Bus Adapters (HBAs). Please note that HPE SSA is supported on HPE ProLiant Gen8 servers and controllers only. Please refer to the [HPE Smart Storage Administrator User Guide](#) for information about usage and support.
- If you use the HP Dynamic Array controller, refer to the [HP Dynamic Smart Array RAID Controller User Guide](#) for information about configuration, installation, operation, and support.
- Ensure enough disk space is available for installation. For disk space requirements, please refer to the “[Minimum system requirements](#)” section in this white paper.
- Choose an installation method: DVD, hard drive, NFS, URL (HTTP/FTP).
- Choose a boot method: local media, network, or the HPE Integrated Lights-Out Virtual Media.
- Prepare driver updates, if necessary, during installation.



Installation procedures

To install Red Hat Enterprise Linux 7 on 64-bit architectures, complete the following steps.

Installing using local media

1. Make sure the server has a DVD drive (either native or attached).

Note

A license key might be required to use iLO Virtual Media with HPE ProLiant servers. For instructions on using iLO Virtual Media to install the OS, see the HPE iLO 4 User Guide available at: hpe.com/info/ilo.

(First click the Resources tab. In the User Guides section of the HPE iLO resources page, select the HPE iLO 4 User Guide title.)

2. To begin the installation, insert the Red Hat Enterprise Linux 7 media into the DVD drive and boot the server from the DVD.
3. Select the method of installation: text or GUI.
 - a. For text-based installations, you can enter the appropriate kernel options, if applicable.
 - b. For GUI-based installations, follow the on-screen instructions.
4. Select the preferred Boot Menu option. The default option is “Test this media & install Red Hat Enterprise Linux 7.0.”
5. Continue following the on-screen instructions to complete the installation.

Installing using PXE boot via network

1. Make sure a properly configured PXE server and network adapter that supports PXE are available.
2. If a driver update diskette is required to support a driver that is not in the distribution, ensure the driver is added to the PXE server. You can find instructions on how to add a driver update to the PXE server at: access.redhat.com/articles/15453 (to view this Red Hat Knowledgebase article, you need a Red Hat Network subscription).
3. Ensure the computer is configured to boot from the network adapter. In most cases, you can do this by inspecting and modifying the system's BIOS settings.
4. Power on the server to be configured.
5. When the PXE menu appears, select the operating system you want to install.
6. Select the preferred Boot Menu option. The default option is “Test this media and install Red Hat Enterprise Linux 7.0.”
7. Continue following the on-screen instructions to complete the installation.

Upgrading from a previous Red Hat Enterprise Linux release to Red Hat Enterprise Linux 7

Red Hat does not currently support upgrading from an earlier major version of Red Hat Enterprise Linux.

Support for Secure Boot on UEFI platforms

Red Hat Enterprise Linux 7 server operating system includes support for the UEFI Secure Boot feature, which means that Red Hat Enterprise Linux 7 can be installed and run on systems where UEFI Secure Boot is enabled.

The Secure Boot technology ensures that the system firmware checks whether the system boot loader is signed with a cryptographic key authorized by a database contained in the firmware. With signature verification in the next-stage boot loader, kernel, and potentially the user space, it is possible to prevent the execution of unsigned code.

For more information on Secure Boot on UEFI-based HPE servers, please click through the following webpage: hpe.com/h20195/V2/Getdocument.aspx?docname=4AA5-4496ENW



Installing the Service Pack for ProLiant

You can download and install the Service Pack for ProLiant by using the Software Delivery Repository, as described in this section.

Getting SPP updates from the HPE Software Delivery Repository (SDR)

HPE offers a repository hosting the Service Pack for ProLiant and management components from HPE. The repository offers multiple means for acquiring the SPP, including direct download and mirroring. If your system has direct access to the network repository, you can configure your system to query the repository for installing and updating any specified components as needed.

You can find detailed information on the Software Delivery Repository and retrieval methods at: downloads.linux.hpe.com/SDR.

HPE Server Support Guide for Service Pack for ProLiant is available at: hpe.com/info/spp/documentation.

Smart Update Manager (SUM)

SPP is deployed using SUM, designed to enable consolidated maintenance and distribution of firmware and software components. SUM enables you to deploy software for multiple HPE ProLiant servers from a single GUI. SUM detects the installed hardware and current versions of firmware and software in use on targeted servers. SUM installs only the required and user-selected components. The default configuration is to install all available components. Before launching SUM, you must ensure that all necessary Red Hat Package Managers are installed and that the minimum requirements for operation are met. For a list of required RPMs and minimum requirements, refer to the [SUM release notes](#).

Information on SUM can be found at: hpe.com/info/hpsum.

The Smart Update Manager User Guide and Smart Update Manager Release Notes are available at: hpe.com/info/hpsum/documentation.

Installing the Service Pack for ProLiant

You can install the Service Pack for [ProLiant](#) through the Software Delivery Repository or from the deliverable downloaded from hpe.com. Before installing the SPP, ensure that any necessary RPMs are installed. For a list of RPMs required for installation, please refer to the release notes for SPP or SUM.

For more detail on the Linux management components available from HPE, refer to the document titled, "[Managing ProLiant Servers with Linux HOWTO](#)."

Deploying SPP with SUM

1. Verify that the minimum requirements for SUM in Red Hat Enterprise Linux 7 are met. You can find a list of platform-specific compatibility libraries in the SUM help file. You can view the SUM help file (`hpsum_welcome_help_en.html`) in a web browser without starting SUM.
2. Start SUM.
3. In the **Source Selection** screen, verify that the directory path in the **Directory** field has the location of the smart components in the SPP, and then select **Start Inventory**. SUM performs an inventory of the available updates and discovers the hardware and software installed on the local system. After the inventory and discovery processes are complete, the **Select Installation Hosts** screen appears.
4. Select the local host or one (or more) remote hosts for SPP deployment. The **Select Bundle Filter** screen displays the SPP bundle information.
5. Select the bundle and the appropriate filter options. For remote deployments, additional screens enable you to update information on a per-host basis.
6. After selecting the bundle for all hosts being updated, access the **Select Items to be Installed** screen to complete the following tasks:
 - a. Select the components to be installed.
 - b. Review failed dependencies before installation.
 - c. Review the revision history of the components.
7. To proceed with the installation, click **Install**. After the installation is complete, the **Installation Results** screen appears.



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8. If any components failed to install successfully, complete the following steps:
 - a. Review the installation logs for information about any failures.
 - b. Exit SUM.
 - c. Make the required updates to the environment.
 - d. Restart installation of the SPP.

For more information about SUM and other installation methods, see the Smart Update Manager User Guide available at: hpe.com/info/hpsum/documentation.

For more information

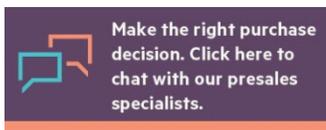
For additional information, refer to the resources listed below.

Resource description	Web address
HPE and Red Hat partnership	hpe.com/us/en/product-catalog/detail/pip.5393115.html
Red Hat	redhat.com
Red Hat software and downloads	access.redhat.com/downloads
Red Hat product documentation	access.redhat.com/knowledge/docs/
Red Hat Hardware Catalog	access.redhat.com/ecosystem (in particular, see access.redhat.com/ecosystem/)
HPE ProLiant and BladeSystem servers support and certification matrices; technical exception matrices	hpe.com/servers/rhelcert
HPE Operating System Services	hpe.com/info/proliantlinux
Industry standard server technology training and communications	hpe.com/docs/serverttechnology h20195.www2.hpe.com/v2/doctype.aspx?doctype=white+paper&lc=en&cc=us

Next steps

Please contact your HPE representative or visit: hpe.com/us/en/contact-hpe.html

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