

Dell PowerEdge Systems Red Hat Enterprise Linux 7 Installation Instructions and Important Information



Notes, Cautions, and Warnings

 **NOTE:** A NOTE indicates important information that helps you make better use of your computer.

 **CAUTION:** A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

 **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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Contents

1 Overview.....	4
System configuration requirements.....	4
Operating system architecture.....	4
Memory.....	4
Bootable disk size.....	4
Installation and upgrade instructions.....	5
Reviewing preconfiguration options.....	5
Operating system packages pre-installed by Dell.....	5
Languages.....	5
Storage partitions.....	5
2 Installing or reinstalling your operating system.....	7
Important information before installing.....	7
Installing with Dell Unified Server Configurator.....	7
Installing on systems with a Dell Utility Partition.....	8
Installing on devices that support multipathing.....	9
Installing on iSCSI storage.....	9
Installing using the Software iSCSI initiator.....	9
Installing using the hardware iSCSI initiator.....	10
Installing on FCoE-enabled storage.....	10
Add-on device drivers.....	10
Updating your system packages using the Red Hat Network.....	10
Important information.....	11
biosdevname utility.....	11
3 Issues or limitations before installation.....	12
Installing Red Hat Enterprise Linux 7 by using the iDRAC Virtual Media does not resume if the iDRAC network is set to the shared LOM mode.....	12
Unable to shutdown the Red Hat Enterprise Linux 7 when you select the Graceful shutdown option or when you press the power button on the system.....	12
Kernel panic occurs when OMSA services are started on Red Hat Enterprise Linux 7.....	12
Unable to install Red Hat Enterprise Linux 7 in UEFI mode.....	13
4 Getting help.....	14
Contacting Dell.....	14
Related documentation.....	14
Documentation matrix.....	15
Documentation feedback.....	15

Overview

Red Hat Enterprise Linux is available on the following architectures:


- 64-bit AMD
- 64-bit Intel

System configuration requirements

For detailed system configuration requirements for this version of Red Hat Enterprise Linux, see the documentation at redhat.com/support.

Operating system architecture

Dell supports the x86_64 version of Red Hat Enterprise Linux 7 on all Dell PowerEdge systems. To check if your PowerEdge system supports Red Hat Enterprise Linux 7, see the operating systems support matrix at dell.com/ossupport.


 **NOTE:** Red Hat Enterprise Linux version 7.0 or later does not support the x86 version of the operating system.

Memory

The following table lists the system memory requirements on the x86_64 architecture of Red Hat Enterprise Linux 7, as recommended by Red Hat.

Table 1. Memory Requirements for x86_64 Architecture

Memory	Size
Minimum recommended system memory	1 GB per logical CPU
Maximum certified system memory	6 TB

 **NOTE:** The maximum system memory supported by the kernel might be greater than the value listed in this table. For more information, see redhat.com/rhel/compare.

Bootable disk size

By default, Red Hat Enterprise Linux 7 configures partitions based on the boot mode of the system.

Table 2. Bootable disk size

Interface	Disk/LUN
BIOS or UEFI	Lesser than 2.2 TB
UEFI	Greater than 2.2 TB

Installation and upgrade instructions

For information on installing or upgrading from a previous version of Red Hat Enterprise Linux 7, see the *Installation Instructions and Important Information* at dell.com/operatingsystemmanuals.

Reviewing preconfiguration options

The following sections describe packages and options that are installed or preconfigured by Dell.

Operating system packages pre-installed by Dell

Dell has pre-installed on your system a set of operating system packages that provides the features required by system users. If you require additional features that are not provided by the packages, install additional packages from the Red Hat installation media or through Red Hat Network.

Languages

Your system is pre-installed with the Red Hat operating system for the following languages:

- English
- French
- German
- Korean
- Spanish
- Japanese
- Simplified Chinese

Storage partitions

The following tables list the partition schemes for a preinstalled Red Hat Enterprise Linux 7 operating system.


Table 3. Preinstalled Red Hat Enterprise Linux partitions and mount points for the primary hard disk drive


Mount Point	Size (MB)	Partition Type	Volume Group
Utility Partition	32–326	FAT 32	N/A
/	1024	XFS	LogVol00
/boot	200	XFS	N/A
Swap	automatic	Linux swap	LogVol01
/usr	7168	XFS	LogVol02
/tmp	500	XFS	LogVol03

Mount Point	Size (MB)	Partition Type	Volume Group
/var	5120	XFS	LogVol04
/home	1024	XFS	LogVol05

Table 4. Preinstalled Red Hat Enterprise Linux partitions and mount points for 50 GB hard disk drive and 64 GB RAM

Mount Point	Size (MB)	Partition Type	Volume Group
Utility Partition	32–326	FAT 32	N/A
/	1024	XFS	LogVol00
/boot	200	XFS	N/A
Swap	Vendor recommended	Linux swap	LogVol01
/usr	10240	XFS	LogVol02
/tmp	500	XFS	LogVol03
/var	6144	XFS	LogVol04
/home	2048	XFS	LogVol05

 **NOTE:** The size of the default Logical Volume Management (LVM) partitions (such as, **/usr** and **/tmp**) is based on a single 36 GB hard drive. If you have a larger hard drive or multiple hard drives, use the various native LVM tools to resize the existing partitions and create new partitions, as per your custom requirements.


 **NOTE:** The minimum swap size is 250 MB. For memory up to 4 GB, it is recommended that the minimum swap size be at least 2 GB. For the recommended swap size, see docs.redhat.com/docs.

Installing or reinstalling your operating system


Important information before installing

You must decide on the boot mode to be used for the system under installation. There are two boot modes available on Dell PowerEdge Servers.

- BIOS
- UEFI

 **NOTE:** The boot configurations of UEFI and BIOS differ significantly from each other. Therefore, the installed system must boot using the same firmware that was used during installation. You cannot install the operating system on a system that uses BIOS and then boot this installation on a system that uses UEFI.

Hence, it is mandatory to select the required boot mode prior to the installation.

 **CAUTION: Back up all data from the system before installing or upgrading the operating system.**


To install or reinstall your operating system, use one of the following media or methods:


- Installing using the Dell Unified Server Configurator (Dell USC)
- Installing on systems with a Dell Utility Partition
- Installing on devices that support multipathing
- Installing on iSCSI storage
- Installing on Fibre Channel over Ethernet (FCoE) enabled storage

Installing with Dell Unified Server Configurator


 **CAUTION: Ensure that you back up all data from the system before installing or upgrading the operating system.**

Dell USC provides an **OS Deployment wizard** that assists you with the installation of Red Hat Enterprise Linux 7.

 **NOTE:** Dell USC may not provide the latest drivers that are required to complete the installation of the operating system. Download the drivers from the Dell FTP website at ftp.dell.com, or use the *Dell Systems Management Tools and Documentation* media.


-  **NOTE:** Dell Unified Server Configurator-Lifecycle Controller Enabled (USC-LCE) comes with embedded drivers that are factory installed. It is recommended that you run the **Platform Update wizard** to ensure that you have the latest drivers before you install the operating system. For more information, see the *Dell Unified Server Configurator - Lifecycle Controller Enabled User Guide* at dell.com/support/home.


To begin installation using the **OS Deployment wizard**:

1. Boot the system, and press <F10>. The Dell logo is displayed.
2. Click **OS Deployment** on the left pane.
3. Click **Deploy OS** on the right pane.
 -  **NOTE:** If your system has a RAID controller, you must configure RAID before you continue with the installation of drivers. For more information, see the *Dell Unified Server Configurator - Lifecycle Controller Enabled User Guide* at dell.com/support/manuals.
4. From the list of operating systems, select **Red Hat Enterprise Linux 7x86_64 bit**.
Dell USC or USC-LCE extracts the driver update disk to an internal USB drive labeled **OEMDRV**.

After the drivers are extracted, Dell USC or USC-LCE prompts you to insert the operating system installation media.

5. Click **Next**.
6. Select **BIOS** or **UEFI** when prompted, and click **Next**.
7. Insert the Red Hat Enterprise Linux installation media, and click **Next**.
8. Click **Finish** to reboot the system and continue with the operating system installation by booting to the operating system media.

 **NOTE:** Upon reboot, the system prompts you to press a key to boot to the operating system media. If you do not press a key, the system boots to the hard drive.


 **NOTE:** All the copied drivers are removed after 18 hours. You must complete the operating system installation within 18 hours. To remove the drivers before 18 hours, reboot the system, press <F10>, and re-enter Dell USC.

Installing on systems with a Dell Utility Partition


 **CAUTION:** Ensure that you back up all data from the system before installing or upgrading the operating system.

The Dell Utility Partition contains diagnostics and other utilities that can be initiated during system boot. If you are installing or reinstalling Red Hat Enterprise Linux 7 on a system with a Dell Utility Partition, install the boot loader on the first sector of the boot partition. This retains the option of booting from the Dell Utility Partition as the system does not overwrite the MBR.

To install Red Hat Enterprise Linux:

1. Select the appropriate option in **Which type of installation would you like?**
 -  **NOTE:** Such that the existing Dell Utility Partition is not deleted.
2. Select **Review and Modify partitioning layout** and click **Next**.
3. Review the partition setup and click **Next**.
4. Confirm to **Write changes to disk**.
5. When prompted to install the boot loader, click **Change Device**.

6. Select **First sector of boot partition** and click **OK**.
7. Follow the instructions on your screen and complete the installation.

 **NOTE:** By default, the installer does not overwrite the utility partition.

Installing on devices that support multipathing

 **CAUTION:** Ensure that you backup all data from the system before installing or upgrading the operating system.

1. Configure the storage array to enable multipathing.
To configure the storage array for your system, see the specific PowerVault system documentation at dell.com/powervaultmanuals.
2. After the storage array is set up, follow the *Prerequisite Steps* for using multipath devices from the *Dell PowerVault MD3200 and MD3220 Storage Arrays Owner's Manual* at dell.com/powervaultmanuals.
3. During the operating system installation, select **Specialized Storage Devices** in the **Storage Devices** screen.
4. Click **Next**.
5. In the **Storage Device Selection** screen, click the **Multipath Devices** tab.
6. Select the multipath device displayed on this screen and continue with the installation.

Installing on iSCSI storage

 **CAUTION:** Ensure that you backup all data from the system before installing or upgrading the operating system.

Red Hat Enterprise Linux 7-based systems can connect to an iSCSI storage array either through the iSCSI software stack, an iSCSI Host Bus Adapter (HBA), or an iSCSI offload hardware.

Currently, you cannot install Red Hat Enterprise Linux 7 through an iSCSI offload hardware. You can install Red Hat Enterprise Linux 7 either through the iSCSI software stack (referred to as software initiator) or the iSCSI HBA (referred to as hardware initiator).

Installing using the Software iSCSI initiator

 **CAUTION:** Ensure that you backup all data from the system before installing or upgrading the operating system.

1. Configure the network interface controllers to access the iSCSI storage.
2. During the operating system installation, select **Specialized Storage Devices** in the **Storage Devices** screen, and then click **Next**.
3. In the **Storage Device Selection** screen, click **Advanced Storage Options** to connect to the iSCSI target or FCoE SAN.
4. Select **Add iSCSI Target** and click **Add Drive**.
5. In the **Configure iSCSI Parameters** screen, provide the required information and click **Add Target** to connect to the iSCSI target.

Installing using the hardware iSCSI initiator

 **CAUTION:** Backup all data from the system before installing or upgrading the operating system.

1. Configure the network interface controllers to access the iSCSI storage.
2. During the operating system installation, select **Specialized Storage Devices** in the **Storage Devices** screen and click **Next**.
3. In the **Storage Device Selection** screen, click the **Other SAN Devices** tab.
4. Select the SAN device displayed on this screen and continue with the installation.


Installing on FCoE-enabled storage

 **CAUTION:** Backup all data from the system before installing or upgrading the operating system.


1. During the operating system installation, select **Specialized Storage Devices** in the **Storage Devices** screen and click **Next**.
2. In the **Storage Device Selection** screen, click **Add Advanced Target**.
The **Advanced Storage Options** screen is displayed. You can connect to the iSCSI target or the FCoE SAN through this screen.
3. To configure FCoE SAN, select **Add FCoE SAN** and click **Add Drive**.
The **Configure FCoE Parameters** screen is displayed.
4. Select the network interface that is connected to your FCoE switch and click **Add FCoE Disk(s)**.

Add-on device drivers


All Dell add-on device driver packages that are not on the Red Hat Enterprise Linux 7 media are packaged as kernel module packages (kmods). For devices that require updated drivers other than those present on the Red Hat Enterprise Linux 7 media, see dell.com/support.

 **NOTE:** Your system does not require a driver update if there are no driver packages available on dell.com/support.

For a list of add-on device drivers that are installed on your system, type the following command at the command prompt: `rpm -qa |grep kmod`

 **NOTE:** For more information on add-on drivers, see the Red Hat Enterprise Linux driver update program at driverupdateprogram.com.

Updating your system packages using the Red Hat Network

 **NOTE:** To update your system with the latest operating system packages using RHN (Red Hat Network) service, see rhn.redhat.com.

Red Hat periodically releases software updates to fix issues, address security issues, and add new features and hardware support. You can download updated operating system packages and the latest kernel releases and updates:

- By performing a manual download from the RHN service at rhn.redhat.com.

- By using the `yum` utility.

It is recommended that you use the RHN service to update your system software to the latest revisions before deploying your system.

Important information

biosdevname utility


In the earlier versions of Red Hat Enterprise Linux, the interface names assigned by the operating system did not map to the corresponding ports on the system board or on the add-in network adapters. For example, `eth0` need not necessarily be associated with `port0` on the system board.

The `biosdevname` utility enables the operating system to logically assign and map Ethernet interface names with the respective physical ports on the system board or the add-in network adapters.

The new naming convention is as follows:

Lan-On-Motherboard interfaces	<i>em <port number></i> (ethernet-on-motherboard <1,2,..>)
PCI add-in interfaces	<i>p<slot number>p<port number>_<virtual function instance></i>

For more information on the `biosdevname` utility and the new naming scheme, see linux.dell.com/files/whitepapers/.

 **NOTE:** If you do not wish to use the new naming scheme, you can turn it off during installation or post installation by passing the kernel command line parameter `biosdevname=0`. The new naming scheme is enforced by default at the time of installation and run time on supported Dell systems.

Issues or limitations before installation

Installing Red Hat Enterprise Linux 7 by using the iDRAC Virtual Media does not resume if the iDRAC network is set to the shared LOM mode

- Description:** When installing Red Hat Enterprise Linux 7 by using the iDRAC Virtual Media, where the iDRAC network is set to **Shared LOM** mode, Red Hat Enterprise Linux 7 installer initiates a reset on the LAN on Motherboard (LOM) devices.
- Applies to:** Red Hat Enterprise Linux 7.0
- Cause:** If **Spanning Tree** is enabled on the switch, there could be a delay in the switch port forwarding network traffic. This delay results in loss of connection to iDRAC or Virtual Media and the installation stops. After sometime the connectivity is restored but the installer but the installation does not resume. This is an expected behavior from the installer.
- Workaround:** Disable **Spanning Tree Protocol** (STP) or set **PortFast** on the uplink port to the iDRAC, during the Virtual Media installation.

Unable to shutdown the Red Hat Enterprise Linux 7 when you select the Graceful shutdown option or when you press the power button on the system

- Description:** When you select the **Graceful shutdown** option from iDRAC or press the power button, the system goes to a suspended state and all the tasks stop. The system restarts to the login prompt on pressing any key.
- Applies to:** Red Hat Enterprise Linux 7.0
- Cause:** By default the **Power button action** drop-down menu is mapped to the **Suspended** state in the gnome-tweak-tool.
- Workaround:** Select **Shutdown** from the **Power button action** drop-down menu.

Kernel panic occurs when OMSA services are started on Red Hat Enterprise Linux 7

- Description:** Kernel panic occurs when OpenManage Server Administrator (OMSA) services are started on Red Hat Enterprise Linux 7.

Applies to: Red Hat Enterprise Linux 7.0

Cause: The Kernel might spend more time in servicing the kernel timer functions and set a flag to prevent the other code from resetting the timer hardware (APIC timer). Then it programs the timer hardware for a timeout up to 100 ms to run the kernel timer functions. At the next timer hardware interrupt, this flag is cleared. However, there is a bug in the kernel where this flag can be ignored in one specific code path. When this happens, the timer hardware can be set to the wrong timeout value. This incorrect timeout value can be over 10 seconds during this time no kernel timer functions will be run.

Workaround: Update the kernel to Z-stream kernel.

Unable to install Red Hat Enterprise Linux 7 in UEFI mode

Description: During the installation of Red Hat Enterprise Linux 7, the Anaconda installer is unable to create boot entry using `EFIbootmgr`, in the UEFI mode.

Applies to: Red Hat Enterprise Linux 7.0

Cause: `EFIbootmgr` is unable to create a UEFI boot entry, when boot variables of Hard drive C: (under BIOS) is greater than 1024bytes. This is a known limitation.

Workaround:

1. Remove all the bootable devices shown under `Hard Drive C:` (listed in BIOS under F11 option).
2. Boot into legacy BIOS, and change the boot setting to UEFI mode.
3. Reboot the server, re insert the devices that we removed under `Hard Drive C:` and reinstall.



Getting help

Contacting Dell

Dell provides several online and telephone-based support and service options. If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer-service issues:

1. Go to **dell.com/support**.
2. Select your country from the drop-down menu on the bottom right corner of the page.
3. For customized support:
 - a. Enter your system Service Tag in the **Enter your Service Tag** field.
 - b. Click **Submit**.
The support page that lists the various support categories is displayed.
4. For general support:
 - a. Select your product category.
 - b. Select your product segment.
 - c. Select your product.
The support page that lists the various support categories is displayed.

Related documentation

-  **NOTE:** For all PowerEdge and PowerVault documentation, go to **dell.com/poweredgemanuals** and **dell.com/powervaultmanuals**. Enter the system Service Tag to get your system documentation.
-  **NOTE:** For information on deploying Red Hat Enterprise Virtualization, see the product documentation available at **docs.redhat.com**.

Your product documentation from Dell includes:

- Installation Guide
- Release Notes

Documentation matrix

The documentation matrix provides information on documents that you can refer to for setting up and managing your system.

To...	Refer to...
Install your system into a rack	Rack documentation included with your rack solution
Set up your system and know the system technical specifications	<i>Getting Started With Your System</i> that shipped with your system or see dell.com/poweredgemanuals
Install the operating system	Operating system documentation at dell.com/operatingsystemmanuals
Get an overview of the Dell Systems Management offerings	Dell OpenManage Systems Management Overview Guide at dell.com/openmanagemanuals
Configure and log in to iDRAC, set up managed and management system, know the iDRAC features and troubleshoot using iDRAC	Integrated Dell Remote Access Controller User's Guide at dell.com/esmmanuals
Know about the RACADM subcommands and supported RACADM interfaces	RACADM Command Line Reference Guide for iDRAC and CMC at dell.com/esmmanuals
Launch, enable and disable Lifecycle Controller, know the features, use and troubleshoot Lifecycle Controller	Dell Lifecycle Controller User's Guide at dell.com/esmmanuals
Use Lifecycle Controller Remote Services	Dell Lifecycle Controller Remote Services Quick Start Guide at dell.com/esmmanuals
Set up, use, and troubleshoot OpenManage Server Administrator	Dell OpenManage Server Administrator User's Guide at dell.com/openmanagemanuals
Install, use, and troubleshoot OpenManage Essentials	Dell OpenManage Essentials User's Guide at dell.com/openmanagemanuals
Know the features of the storage controller cards, deploy the cards, and manage the storage subsystem	Storage controller documentation at dell.com/storagecontrollermanuals
Check the event and error messages generated by the system firmware and agents that monitor system components	Dell Event and Error Messages Reference Guide at dell.com/esmmanuals

Documentation feedback

If you have feedback for this document, write to documentation_feedback@dell.com. Alternatively, you can click on the **Feedback** link in any of the Dell documentation pages, fill out the form, and click **Submit** to send your feedback.