

Dell Lifecycle Controller Graphical User Interface

Version 2.00.00.00 For 13th Generation Dell PowerEdge Servers User's Guide



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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Introduction

Dell Lifecycle Controller provides advanced embedded systems management to perform systems management tasks such as deploy, configure, update, maintain, and diagnose using a graphical user interface (GUI). It is delivered as part of integrated Dell Remote Access Controller (iDRAC) out-of-band solution and embedded Unified Extensible Firmware Interface (UEFI) applications in the latest Dell servers. iDRAC works with the UEFI firmware to access and manage every aspect of the hardware, including component and subsystem management that is beyond the traditional Baseboard Management Controller (BMC) capabilities.

 **NOTE:** The UEFI environment provides the local console interface and the infrastructure for locally managed system components.

Lifecycle Controller has the following components:

- GUI:
 - Is an embedded configuration utility that resides on an embedded flash memory card.
 - Is similar to the BIOS utility that is started during the boot sequence, and can function in a preoperating system environment.
 - Enables server and storage management tasks from an embedded environment throughout the life cycle of the server.
- Remote Services (WS-Man) simplify end-to-end server life cycle management using the one-to-many method. It interfaces for remote deployment integrated with Dell OpenManage Essentials and partner consoles. For more information about remote services features, see *Dell Lifecycle Controller Remote Services Quick Start Guide* at dell.com/support/home.

Why use Lifecycle Controller?

Systems management is typically a key part of an administrator's role. Installing an operating system, updating firmware for function and policy requirements, configuring devices and getting the most out of an IT network are integral aspects of the administrator's role. Prior to the release of Lifecycle Controller, an administrator had to use tools such as Dell OpenManage Server Administrator (OMSA), Dell Systems Build Update Utility (SBUU), and Dell Deployment Toolkit (DTK) shipped on multiple CDs or DVD. Maintaining and using multiple disks in their many versions was time-consuming effort for the administrator.

To resolve these problems, Dell provides the Lifecycle Controller, a flash chip embedded on the system with the Lifecycle Controller application. The Lifecycle Controller allows IT administrators to do away with media altogether, allowing operating system deployment with locally embedded driver repositories, firmware updates, hardware configuration, and platform-specific diagnostic routines. As Lifecycle Controller is available even when the operating system is not functional or not installed, it allows added flexibility in provisioning the system and customizing to suit your requirements. As the tool is integrated and embedded, formatting or reinstalling the operating system does not remove the tool, thus saving significant time and money.

Benefits of using iDRAC with Lifecycle Controller

The benefits include:

- Increased availability — Early notification of potential or actual failures that help prevent a server failure or reduce recovery time after failure.
- Improved productivity and lower Total Cost of Ownership (TCO) — Extending the reach of administrators to larger number of distant servers can make the IT staff more productive while driving down operational costs such as travel.
- Secure environment — By providing secure access to remote servers, administrators can perform critical management functions while maintaining server and network security.
- Enhanced embedded management through Lifecycle Controller — Lifecycle Controller provides deployment and simplified serviceability through the Lifecycle Controller GUI for local deployment and Remote Services (WS-Man) interfaces for remote deployment integrated with Dell OpenManage Essentials and partner consoles.

For more information on iDRAC, see the *Integrated Dell Remote Access Controller User's Guide* at dell.com/support/home.

What's new in this release?

The new features for this release include:


- Support for Dell PowerEdge R730, R730XD, R630, and T630 servers.
- Support for unattended installation of the Red Hat Enterprise Linux 7 operating system.
- Support for deploying an operating system using UEFI Secure Boot mode.
- Enhanced **Repurpose or Retire System** feature that allows selection of specific server and storage components.
- Support for exporting Technical Support Report (TSR).
- Update iDRAC and Lifecycle Controller firmware using a single firmware image.

Key features

The key features of Lifecycle Controller are:

- Provisioning — Entire preoperating system configuration from a unified interface.
- Deploying — Simplified operating system installation with the embedded drivers on Lifecycle Controller. Unattended installation mode is available for Microsoft Windows and Red Hat Enterprise Linux 7 operating systems.
- Download drivers for operating system installation from one of the following sources:
 - **ftp.dell.com**
 - *Dell Lifecycle Controller OS Driver Packs* DVD for Windows and Linux
- Patching or updating — Operating system agnostic, and reduced maintenance downtime with direct access to updates from **ftp.dell.com**. It simplifies firmware updates by maintaining a working version for rollback.
- Servicing — Continuous availability of diagnostics without depending on a hard-disk drive. Ability to flash firmware automatically, while replacing components such as a Dell PowerEdge storage controller, NIC, and power supply unit. Support for VLAN in network configuration.

- System erase — Deletes the server and storage-related data on selected components of a server. You can delete information on BIOS, Lifecycle Controller logs, iDRAC settings, and storage components on the server.

 **NOTE:** You cannot delete the iDRAC license file.

- Security — Support local key encryption.
- Restoring the server — Back up the server profile (including RAID configuration) and restore the server to a previously known state. Importing a server license, firmware rollback, and restoring system configuration in case of system board replacement.
- Hardware inventory — Provides information about the current and factory system configuration.
- Lifecycle Controller logs for troubleshooting.

Licensable features in Lifecycle Controller

Lifecycle Controller features are available based on the type of license (Basic Management with IPMI, iDRAC Express, iDRAC Express for Blades, or iDRAC Enterprise) that you purchase. Only licensed features are available in the Lifecycle Controller GUI. For more information about managing licenses, see the *Integrated Dell Remote Access Controller User's Guide* at dell.com/support/home. The following table lists the Lifecycle Controller features available based on the license purchased.

Table 1. Licensable Features in Lifecycle Controller

Feature	Base Management with IPMI	iDRAC Express (Rack and Tower Servers)	iDRAC Express (Blade Servers)	iDRAC Enterprise
Firmware Update	Yes	Yes	Yes	Yes
Operating system deployment	Yes	Yes	Yes	Yes
Device configuration	Yes	Yes	Yes	Yes
Diagnostics	Yes	Yes	Yes	Yes
Server profile backup and export	—	—	—	Yes
Server profile import	Yes	Yes	Yes	Yes
Part replacement	—	Yes	Yes	Yes
Local updates	Yes	Yes	Yes	Yes
Driver packs	Yes	Yes	Yes	Yes
Hardware inventory	Yes	Yes	Yes	Yes

Feature	Base Management with IPMI	iDRAC Express (Rack and Tower Servers)	iDRAC Express (Blade Servers)	iDRAC Enterprise
Remote services (through WS-MAN)	—	Yes	Yes	Yes
Technical Support Report (TSR)	Yes	Yes	Yes	Yes
Repurpose or retire system	Yes	Yes	Yes	Yes

Viewing iDRAC license information

After you open the **Lifecycle Controller GUI** page, you can view details about the iDRAC installed on a server. To view the iDRAC license information:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. On any page of Lifecycle Controller, click **About** in the upper-right corner.
3. On the **About** page, click **License Information**.

The following information is displayed on the **iDRAC License Report** page:

- Device ID** Indicates the Service Tag of the server on which iDRAC is installed.
- License**
- **Entitlement ID** — Indicates a unique ID provided by the manufacturer.
 - **Status** — Indicates the status of the installed license.
 - **Description** — Indicates the license details.
 - **License Type** — Indicates the type of license of the device. For example, Evaluation, Evaluation Extension, or Perpetual.
 - **Expiration** — Indicates the date and time at which the license expires.

Other documents you may need

In addition to this guide, you can access the following guides available at dell.com/support/home.

- The *Lifecycle Controller Online Help* provides detailed information about the fields available on the GUI and the descriptions for the same. To view the online help information, click **Help** in the upper-right corner of all Lifecycle Controller pages, or press <F1>.
- The *Lifecycle Controller Release Notes* is available from within the product. To read through the Release Notes within Lifecycle Controller, click **About** in the upper-right corner, and then click **View Release Notes**. A web version is also given to provide last-minute updates to the system or documentation or advanced technical reference material intended for experienced users or technicians.
- The *Dell iDRAC Licensing White paper* at http://en.community.dell.com/techcenter/extras/m/white_papers/20067892.aspx. This document provides an overview of iDRAC digital licensing and how it is different from iDRAC available in the Dell PowerEdge 11th generation servers. It also provides an understanding on iDRAC Express and Enterprise value offerings.
- The *Dell Lifecycle Controller Remote Services For 13th Generation Dell PowerEdge Servers Quick Start Guide* provides information about using remote services.
- The *Systems Management Overview Guide* provides brief information about the various Dell software available to perform systems management tasks.

- The *iDRAC Overview and Feature Guide* provides information about iDRAC, its licensable features, and license upgrade options.
- The *Integrated Dell Remote Access Controller (iDRAC) User's Guide* provides information about configuring and using an iDRAC for rack, tower, and blade servers to remotely manage and monitor your system and its shared resources through a network.
- The *Dell Repository Manager User Guide* provides information about creating customized bundles and repositories comprised of Dell Update Packages (DUPs) for systems running supported Microsoft Windows operating systems.
- The "Lifecycle Controller Supported Dell Systems and Operating Systems" section in the *Dell Systems Software Support Matrix* provides the list of Dell systems and operating systems that you can deploy on target systems.
- The *Dell PowerEdge RAID Controller (PERC) 9 User's Guide* provides specification and configuration-related information about the PERC 9 controllers.
- The *Glossary* provides information about the terms used in this document.
- The *Dell OpenManage Server Update Utility User's Guide* provides information about using the DVD-based application for identifying and applying updates to the system.

The following system documents are available to provide more information:

- The safety instructions that came with your system provide important safety and regulatory information. For additional regulatory information, see the Regulatory Compliance home page at dell.com/regulatory_compliance. Warranty information may be included within this document or as a separate document.
- The *Rack Installation Instructions* included with your rack solution describe how to install your system into a rack.
- The *Getting Started Guide* provides an overview of system features, setting up your system, and technical specifications.
- The *Owner's Manual* provides information about system features and describes how to troubleshoot the system and install or replace system components.
- *Lifecycle Controller Web Services Interface Guide—Windows and Linux*.

Social Media Reference

To know more about the product, best practices, and information about Dell solutions and services, you can access the social media platforms such as Dell TechCenter and YouTube. You can access blogs, forums, white papers, how-to videos, and so on from the Lifecycle Controller wiki page at www.delltechcenter.com/lc.

For Lifecycle Controller documents and other related firmware documents, see www.dell.com/esmmanuals.


Accessing documents from Dell support site

You can access the required documents in one of the following ways:

- Using the following links:
 - For all Enterprise Systems Management documents — dell.com/softwaresecuritymanuals
 - For Enterprise Systems Management documents — dell.com/openmanagemanuals
 - For Remote Enterprise Systems Management documents — dell.com/esmmanuals
 - For OpenManage Connections Enterprise Systems Management documents — dell.com/OMConnectionsEnterpriseSystemsManagement
 - For Serviceability Tools documents — dell.com/serviceabilitytools

- For Client Systems Management documents — dell.com/clientsystemsmangement
- For OpenManage Connections Client Systems Management documents — dell.com/connectionsclientsystemsmangement
- From the Dell Support site:
 - a. Go to dell.com/support/manuals.
 - b. Under **General support** section, click **Software & Security**.
 - c. In the **Software & Security** group box, click the required link from the following:
 - **Serviceability Tools**
 - **Enterprise Systems Management**
 - **Client Systems Management**
 - **Remote Enterprise Systems Management**
 - **Connections Client Systems Management**
 - d. To view a document, click the required product version.
- Using search engines:
 - Type the name and version of the document in the search box.

Contacting Dell

 **NOTE:** 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.

Dell provides several online and telephone-based support and service options. 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 support category.
3. Verify your country or region in the **Choose a Country/Region** drop-down list at the bottom of the page.
4. Select the appropriate service or support link based on your need.

Using Lifecycle Controller

This section provides information about starting, enabling, and disabling Lifecycle Controller. Before using Lifecycle Controller, make sure that the network and iDRAC are configured. For more information, see the *integrated Dell Remote Access Controller User's Guide* at dell.com/support/home.

Starting Lifecycle Controller

To start Lifecycle Controller, restart the system and press <F10> during POST to select Lifecycle Controller from the list displayed. When Lifecycle Controller is started for the first time, it displays the **Settings** wizard that allows you to configure the preferred language and network settings.

 **NOTE:** If the system does not start Lifecycle Controller, see [Launch Messages Causes and Resolutions](#).

Related Links

[Setting up Lifecycle Controller](#)

Start messages, causes, and resolutions

The table lists the messages that appear during system startup, and their appropriate cause and resolution.

Table 2. Start Messages, Cause, And Resolution

Message	Cause	Resolution
Lifecycle Controller disabled	<ul style="list-style-type: none"> • The system is turned on or restarted while iDRAC is initializing. This occurs if: <ul style="list-style-type: none"> – The system is turned on immediately after AC power is connected to the system. – The system is restarted immediately after resetting iDRAC. – A backup server profile operation or restore server profile operation is in progress. • Lifecycle Controller is manually disabled 	<p>Wait for a minute after resetting iDRAC to restart the system, so that iDRAC initializes.</p> <p>Press <F2> during POST, select System Setup → iDRAC Settings → Lifecycle Controller → Enable.</p>

Message	Cause	Resolution
Lifecycle Controller Update Required	<ul style="list-style-type: none"> The embedded device that has a backup of the product may contain corrupted data. Ungracefully exits Lifecycle Controller for 3 consecutive times. 	<p>Enable Lifecycle Controller. For more information, see Enabling Lifecycle Controller.</p> <p>Enable Lifecycle Controller. For more information, see Enabling Lifecycle Controller.</p>
Lifecycle Controller not available	Another process is using iDRAC.	Wait for 30 minutes for the current process to complete, restart the system, and then retry.

Related Links

[Disabling Lifecycle Controller](#)

Enabling Lifecycle Controller

To enable access to Lifecycle Controller during system startup:

1. Press <F2> during POST.
The **System Setup Main Menu** page is displayed.
2. Select **iDRAC Settings**.
The **iDRAC Settings** page is displayed.
3. Select **Lifecycle Controller**.
4. Under **Lifecycle Controller**, select **Enabled**.
5. On the **System Setup Main Menu** page, select **Finish** to save the settings.
6. Select **Yes** to restart the system.

Disabling Lifecycle Controller

To disable access to Lifecycle Controller at system startup:

1. Press <F2> during POST.
The **System Setup Main Menu** page is displayed.
2. Select **iDRAC Settings**.
The **iDRAC Settings** page is displayed.
3. Select **Lifecycle Controller**.
4. Under **Lifecycle Controller**, select **Disabled**.
5. On the **System Setup Main Menu** page, select **Finish** to save the settings.
6. Select **Yes** to restart the system.

Canceling Lifecycle Controller actions

If Lifecycle Controller causes the system to restart twice, cancel the Lifecycle Controller actions. However, if Lifecycle Controller causes the system to restart the third time, the message `Lifecycle Controller update required` is displayed, you must enable Lifecycle Controller. For more information on enabling Lifecycle Controller, see [Enabling Lifecycle Controller](#).

 **CAUTION:** This action cancels all tasks that are being performed by Lifecycle Controller. It is recommended that you cancel the Lifecycle Controller actions only when absolutely necessary.

1. Press <F2> during POST.
The **System Setup Main Menu** page is displayed.
2. In the **System Setup Main Menu** page, select **iDRAC Settings**.
The **iDRAC Settings** page is displayed.
3. Select **Lifecycle Controller**.
4. Under **Cancel Lifecycle Controller Actions**, select **Yes**.
5. On the **System Setup Main Menu** page, select **Finish** to save the settings.
6. Select **Yes** to restart the system.

Using Lifecycle Controller for the first time


After you start Lifecycle Controller for the first time, by default the **Language and Keyboard** page is launched. However, the **Home** page is displayed after subsequent launches. By default, the **Language** is set to **English** and **Keyboard Layout English** is set to **United States**.

Related Links

- [Setting up Lifecycle Controller](#)
- [Updating firmware](#)

Setting up Lifecycle Controller

Use the **Settings** wizard to specify the language, keyboard layout, and network settings for Lifecycle Controller.


 **NOTE:** The changes in the **Settings** wizard do not change the system or other application settings.

Specifying language and keyboard type

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. On the left pane, click **Settings**.
3. On the **Settings** pane, click **Language and Keyboard**. Use the up-arrow and down-arrow keys to select the options.
 - From the **Language** drop-down menu, select the language.
 - From the **Keyboard Type** drop-down menu, select the keyboard type.
4. Click **Finish** to save the new settings.

Configuring network settings for a NIC

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. On the left pane, click **Settings**.
3. On the **Settings** page, click **Network Settings**.
4. From the **NIC Card** drop-down menu, select the NIC port that you want to configure.


 **NOTE:** You can use only one NIC at a time to communicate with the network.

5. From the **IP Address Source** drop-down menu, select one of the following options:
 - **No Configuration** — Click this option to indicate that NIC must not be configured.
 - **DHCP** — Click this option to indicate that the NIC must be configured using an IP address from a DHCP server. If DHCP is selected, a DHCP IP address is displayed on the **Network Settings** page.


- **Static IP** — Click this option to indicate that the NIC must be configured using a static IP. Type the **IP Address Properties** — **IP Address**, **Subnet Mask**, **Default Gateway**, **DNS Address**. If you do not have this information, contact your network administrator.


 **NOTE:** The **IP Address Source** function supports only IPv4.

6. Click **Enabled** and type the **VLAN ID** and **Priority** under **Lifecycle Controller VLAN Settings** to configure the VLAN settings of a NIC.

 **NOTE:** For more information on the VLAN feature, see the *Configuring VLAN Settings in Lifecycle Controller for Dell PowerEdge Servers* white paper at delltechcenter.com/lc.

7. To save the settings, click **Finish**.

 **NOTE:** If Lifecycle Controller settings are not correctly configured, an error message is displayed.

 **NOTE:** If you are unable to connect to a network, verify the settings. For information about correct network settings, contact your network administrator.

Accessing help

Each Lifecycle Controller page has a help associated with it. Press **<F1>** or click **Help** (in the upper-right corner) to view the help information about the features available on a page.

Viewing release notes

1. To view the Release Notes, on all pages of Lifecycle Controller (except the help page of a topic that you view by pressing **<F1>**), click **About**. The **About** page is displayed.
2. Click **View Release Notes**.

Lifecycle Controller features

This section provides a brief description about the Lifecycle Controller features and helps you understand how to use the Lifecycle Controller wizards most effectively. Each feature is a wizard in Lifecycle Controller, which supports the following features:

- **Home** — Navigate back to the **Home** page.
- **Lifecycle Log** — View and export the Lifecycle Controller log, and add a work note to the log.
- **Firmware Update** — Apply updates or perform firmware rollback for the system components, and view the firmware version available on a server.
- **Hardware Configuration** — Configure system devices, view, and export hardware inventory of a system.
- **OS Deployment** — Install an operating system in manual mode or unattended mode by using an 'answer' file.
- **Platform Restore** — Backup, export, and restore system profile. Import iDRAC license from Lifecycle Controller GUI.
- **Hardware Diagnostics** — Perform diagnostics to validate the memory, I/O devices, CPU, physical disks, and other peripherals.
- **Settings** — Specify the language, keyboard layout, and network settings while using Lifecycle Controller.
- **System Setup** — Configure settings for devices or components such as iDRAC, BIOS, RAID, and NIC.

Related Links

[Lifecycle Controller log](#)


[Firmware update](#)
[Firmware rollback](#)
[Hardware inventory view and export](#)
[Configure](#)
[Operating system deployment](#)
[Platform restore](#)
[Hardware diagnostics](#)
[Setting up Lifecycle Controller](#)
[Using the System Setup and boot manager](#)
[Import server license](#)
[Viewing iDRAC license information](#)
[Restoring a server profile after system board replacement](#)

Operating system deployment

The **OS Deployment** feature allows you to deploy standard and custom operating systems on the managed system. You can also configure RAID before installing the operating system if it is not already configured.

Lifecycle Controller allows deploying the operating system using the following options:


- Manual installation
- Unattended installation. For more information on unattended installation, see [Unattended installation](#).
- UEFI Secure Boot. For more information on UEFI Secure Boot, see [UEFI Secure Boot](#).

 **NOTE:** Driver packs are available for the deployment of Windows and Linux operating systems supported by Lifecycle Controller. Before deploying these operating systems, make sure that Lifecycle Controller is updated with the latest driver packs. You can download the latest drivers pack from dell.com/support.


Installing an operating system

Before installing an operating system, make sure that the following prerequisites are met:

- Optical DVD drive, or a virtual media (ISO image) is connected virtually to a server.
- Software RAID or PowerEdge RAID controller is installed with the latest firmware, and at least two hard-disk drives are available for creating the virtual disk. For information about the supported controllers and related firmware, see the operating system documentation.
- For installing an operating system in an unattended mode, make sure that you copy the required configuration file (**autounattend.xml** for Windows and **ks.cfg** for RHEL 7) to a USB or network share.

 **NOTE:** PERC S110 and S130 controllers support only SATA disk drives for which a minimum of two hard-disk drives are required.

To install an operating system:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **OS Deployment**.
3. In the right pane, click **Deploy OS** and select one of the following:
 - **Configure RAID First** — Click to configure a RAID connected to the server. For information about configuring a RAID, see [Using The Optional RAID Configuration](#).
 -  **NOTE:** Configuring RAID is optional if an already-connected virtual disk is present.
 - **Go Directly to OS Deployment** — Click to launch the operating system deployment wizard and start installing an operating system.
4. On the **Select an Operating System** page, select the following and click **Next**:
 - **Boot Mode** — Allows you to select the boot mode — **BIOS** or **UEFI** for installing the operating system. The operating systems in the **Available Operating System** drop-down list box are populated depending on the boot mode selected.

- **Secure Boot** — Allows you to enable or disable the **Secure Boot** option. Click **Enabled** to secure the boot process by checking if the drivers are signed with an acceptable digital signature. This option is available only for the **UEFI** boot mode. For more information on Secure Boot, see [UEFI Secure Boot](#).
 - ✎ **NOTE:** The **Secure Boot** option is available only if the **Load Legacy Video Option ROM** setting is set to disabled. To disable the Load Legacy Video Option ROM setting, click **System Setup** → **System BIOS Settings** → **Miscellaneous Settings** → **Load Legacy Video Option ROM** → **Disabled**.
 - **Secure Boot Policy** — Displays the current setting of the boot policy in the BIOS.
 - ✎ **NOTE:** You can change the **Secure Boot Policy** setting only in BIOS.
 - ✎ **NOTE:** The **Secure Boot** and **Secure Boot Policy** options are available only on the 13th generation of PowerEdge servers.
 - **Available Operating Systems** — Displays the list of operating systems depending on the boot mode selected. Select the operating system to install on the server. The drivers packs for deploying the Windows and Linux operating systems supported by Lifecycle Controller are available and extracted to a local repository (OEMDRV). These driver packs contain the drivers required for installing an operating system.
 - ✎ **NOTE:** If you select VMware ESXi, Citrix XenServer, or select the **Any Other Operating System** option, make sure that you have prepared the necessary drivers for your system. Drivers for VMware ESXi and Citrix XenServer are not included in the driver packs. See [dell.com/support](#) for more information on operating system installation images and drivers for these operating systems.
5. On the **Select Installation Mode** page, select any one of the following:
 - **Unattended Install**
 - **Manual Install**
 - ✎ **NOTE:** The **Unattended Install** option is enabled only if the operating system is compatible for an unattended installation. If the operating system is not compatible, the option is grayed out. For more information on unattended install mode, see [Unattended Installation](#).
 - ✎ **NOTE:** A detailed procedure for installing an operating system using the unattended installation mode is provided in the *Unattended Installation of Operating Systems from Lifecycle Controller on Dell PowerEdge Servers* white paper at [delltechcenter.com/lc](#).
 6. On the **Select Installation Mode** page, select or enter the appropriate data to import the operating system configuration file and then click **Next**.
For more information about the fields available on the **Select Installation Mode** page, see the online help by clicking **Help** in the upper-right corner of the Lifecycle Controller GUI.
 7. On the **Insert OS Media** page, insert the appropriate operating system media and click **Next**.
Lifecycle Controller validates the media and displays an error message if the verification process is not successful. The verification may be unsuccessful if:
 - An incorrect operating system media is inserted.
 - An operating system media is damaged or corrupted.
 - The optical drive in the system cannot read the media.
 8. On the **Reboot the System** page, the summary of selections is displayed. Verify the selections and click **Finish**.
The system reboots and starts the operating system installation. For more information on the post-reboot scenarios, see [Post Reboot Scenarios](#).

Related Links

[UEFI Secure Boot](#)

- [Unattended installation](#)
- [Post reboot scenarios](#)
- [Using the optional RAID configuration](#)

Using the optional RAID configuration


When you install an operating system, you can:

- Deploy the operating system without configuring RAID.
- Configure the hard-disk drives using the optional RAID configuration wizard and deploy the operating system.

Alternatively, you can configure RAID through the RAID configuration page from the **Hardware Configuration** → **Configuration Wizards** → **RAID Configuration**.


Configuring RAID using the operating system deployment wizard

To configure RAID using the **OS Deployment** page:

 **NOTE:** If the system has a RAID controller, you can configure a virtual disk as the boot device. Create boot virtual disk only from disk drives populated across 0–3 of the system. For slot information, see the system Owner's Manual at dell.com/support/home.

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **OS Deployment**.
3. On the **OS Deployment** page, click **Deploy OS**.
4. On the **Deploy OS** page, click **Configure RAID First**, and then click **Next**.

The storage controllers available for configuration are displayed in the **RAID Configuration** page.


 **NOTE:** Make sure that the selected controller is not in a non-RAID mode.

5. Select a storage controller.
The RAID configuration options are displayed.
6. Follow the instruction on the screen, complete the RAID setting tasks, and then click **Finish**.
The RAID configuration is applied to the virtual disks, and the **Select an Operating System** page is displayed. You can proceed with installing the operating system. For information on installing the operating system, see [Installing An Operating System](#).

Unattended installation

An unattended installation is a scripted operating system installation process that allows you to install an operating system using the configuration file with minimal intervention. A scripted configuration file that contains the desired operating system setting information is required for this option. The **Unattended Install** option is available only if the operating system that you have selected for installation is compatible for an unattended installation. To deploy an operating system using the unattended mode, see [Installing An Operating System](#).

You can also see the *Unattended Installation of Operating Systems from Lifecycle Controller on Dell PowerEdge Servers* white paper at delltechcenter.com/lc.

 **NOTE:** The unattended installation feature is supported only for Microsoft Windows and Red Hat Enterprise Linux 7 operating systems. If you select an operating system other than Windows or Red Hat Enterprise Linux 7, the **Unattended Install** option is grayed out.

Related Links

- [Installing an operating system](#)
- [Using the optional RAID configuration](#)

UEFI Secure Boot


The UEFI Secure Boot is a technology that secures the boot process by verifying if the drivers and operating system loaders are signed by the key that is authorized by the firmware. When enabled, Secure Boot makes sure that:


- BIOS boot option is disabled.
- Only UEFI-based operating systems are supported for operating system deployment in all management applications.
- Only authenticated EFI images and operating system loaders are started from UEFI firmware.


You can enable or disable the Secure Boot attribute locally or remotely using Dell management applications. Lifecycle Controller supports deploying an operating system with the Secure Boot option only in the UEFI boot mode.

There are two BIOS attributes that are associated with Secure Boot:

- **Secure Boot** — Displays if the **Secure Boot** is enabled or disabled.
- **Secure Boot Policy** — Allows you to specify the policy or digital signature that BIOS uses to authenticate. The policy can be classified as:
 - **Standard** — BIOS uses the default set of certificates to validate the drivers and operating system loaders during the boot process.
 - **Custom** — BIOS uses the specific set of certificates that you can import or delete from the standard certificates to validate the drivers and operating system loaders during the boot process.

 **NOTE:** The **Secure Boot Policy** is read-only in Lifecycle Controller. You can change this setting only in the BIOS. To enter BIOS system setup, press **<F2>** during POST.

 **NOTE:** The **Secure Boot** feature is supported only on the 13th generation of Dell PowerEdge servers. To deploy an operating system using the Secure boot option, see [Installing An Operating System](#).

 **NOTE:** For more information on UEFI, go to uefi.org.

Related Links


- [Installing an operating system](#)
- [Using the optional RAID configuration](#)

Driver access

Lifecycle Controller provides a local repository for drivers that are required for installing the operating system. Based on the operating system you want to install, the **OS Deployment** wizard extracts these

drivers and copies them to a temporary directory (OEMDRV) on the managed system. These files are deleted after 18 hours or when you:

- press <F10> to cancel the operating system installation
- restart Lifecycle Controller after restarting the server
- perform an AC power-cycle operation


 **NOTE:** Before installing an operating system, make sure that Lifecycle Controller is updated with the latest driver packs. You can download the latest Lifecycle Controller drivers at dell.com/support.

Installing an operating system on iSCSI LUN and FCoE LUN

You can install an operating system on an iSCSI LUN and FCoE LUN by using the **System Setup** page. A detailed procedure for installing is provided in the *Deploying Operating System on iSCSI & FCoE LUN* white paper at delltechcenter.com/lc.

Post reboot scenarios

The following table lists the post reboot scenarios, its user actions, and impact.

Scenario	User Action and Impact
During POST, the system prompts you to press a key to boot to the operating system installation media.	Press any key to begin the operating system installation; else, the system boots to the hard-disk drive and not the operating system installation media.
Operating system installation is interrupted and the system restarts before the installation is completed.	The system prompts you to press a key to boot from the operating system installation media.
Cancel operating system installation.	Press <F10>.
	 NOTE: If you press <F10> during the installation process or a restart, the drivers provided by the operating system deployment wizard is removed.
During the 18-hour period when drivers are extracted to a temporary location after the operating system is installed, you cannot update the component firmware using a DUP. If you attempt a DUP through the operating system during this time period, the DUP displays a message that another session is active.	Lifecycle Controller does not allow DUP after the operating system installation. However, if you disconnect the power supply to the managed system, the OEMDRV directory is erased.

Related Links

- [Installing an operating system](#)
- [Using the optional RAID configuration](#)

Monitor

Using Lifecycle Controller, you can monitor the hardware inventory and events of a server throughout its life cycle.

Hardware inventory view and export


Lifecycle Controller provides the following wizards to manage the system inventory:

- **View Current Inventory**
- **Export Current Inventory**
- **View Factory Shipped Inventory**
- **Export Factory Shipped Inventory**
- **Collect System Inventory on Restart**

About view and export current inventory

You can view information about the currently installed hardware components that are internal to the system chassis and the configuration for each component. All the currently installed hardware components such as fans, PCI devices, NICs, DIMMs, PSU, and their properties and values are displayed. You can export this information to a compressed XML file and then to a USB drive or network share. The XML file is saved in the following format: **HardwareInventory_<servicetag>_<timestamp>.xml**.

For more information about the easy-to-use names of the hardware components, see [Easy-To-Use System Component Names](#).

 **NOTE:** Incorrect inventory data is displayed or exported after performing a system erase. For viewing the correct inventory data, see [Viewing and Exporting Current Inventory After Resetting Lifecycle Controller](#).

Related Links

[Viewing hardware inventory – current or factory shipped](#)


[Exporting hardware inventory – current or factory shipped](#)

[Viewing or exporting hardware inventory after part replacement](#)

About view and export factory-shipped inventory

You can view information about the factory-installed hardware components and their configuration. You can export this information in an XML format to a USB drive or a network share. The XML file is saved in this format: **FactoryShippedHWInventory_<servicetag>.xml**.

For more information about the easy-to-use names of the hardware components, see [Easy-to-use System Component Names](#).


 **NOTE:** View and export factory-shipped inventory feature is grayed out if the **Repurpose or Retire System** option is selected, which permanently deletes the factory-shipped inventory.

Related Links

[Viewing hardware inventory – current or factory shipped](#)

[Exporting hardware inventory – current or factory shipped](#)


Viewing hardware inventory – current or factory shipped

 **NOTE:** For factory-shipped inventory, the status of few parameters for the installed components is displayed as **Unknown**.


To view the currently installed or factory-installed hardware components and their configuration details:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Hardware Configuration**.
3. In the right pane, click **Hardware Inventory**.
4. To view the current- or factory-shipped inventory, click **View Current Inventory** or **View Factory Shipped Inventory** respectively.

A list of hardware components are displayed on the **View Current Hardware Inventory** page.

 **NOTE:** Lifecycle Controller does not provide the driver version for the RAID controller. To view the driver version, use iDRAC, OpenManage Server Administrator Storage Service, or any other third-party storage management application.

5. Select from the **Filter by Hardware Component** drop-down menu to filter the components. The Fully Qualified Device Descriptor (FQDD) property of a component is also listed along with other properties of a hardware component.

 **NOTE:** You can also filter data by a FQDD property of the hardware component. By default, the **FQDD Device Description** property value is displayed for every hardware component listed.

Related Links

[About view and export current inventory](#)

[About view and export factory-shipped inventory](#)

Exporting hardware inventory – current or factory shipped

Before exporting the currently installed or factory-installed hardware components and their configuration, make sure that the following prerequisites are met:

- If you use the network share (shared folder), configure the **Network Settings**. For more information, see [Configuring Network Settings For A NIC](#).
- If you are storing the exported file on a USB drive, make sure that a USB drive is connected to the managed system.


To export the current or factory-shipped hardware inventory:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Hardware Configuration**.
3. In the right pane, click **Hardware Inventory**.
4. Click **Export Current Inventory** or **Export Factory Shipped Hardware Inventory**.

5. If you are exporting the inventory to a local USB drive, select **USB Drive**. If you are exporting the file to a shared folder on a network, select **Network Share**.


For more information, see [Exporting Hardware Inventory To A USB Drive](#) or [Exporting Hardware Inventory To A Network Share](#).

To verify if Lifecycle Controller is able to connect to the IP address that you entered, click **Test Network Connection**. By default, Lifecycle Controller pings the Gateway IP, DNS server IP, and the host IP.

 **NOTE:** If the DNS is not able to resolve the domain name, Lifecycle Controller cannot ping the domain name and cannot display the IP address. Make sure that the DNS issue is resolved, and then retry the operation.

6. Click **Finish** to export the inventory.

The **HardwareInventory_<servicetag>_<timestamp>.xml** or **FactoryShippedHWInventory_<servicetag>.xml** file is copied to the specified location. For the current inventory, the time stamp is in the format **yyyy-mm-ddth:mm:ss**, where 't' indicates time.

 **NOTE:** For factory-shipped inventory, the status of few parameters for the installed components is displayed as **Unknown**.


Related Links

- [About view and export current inventory](#)
- [About view and export factory-shipped inventory](#)
- [Exporting hardware inventory to a USB drive](#)
- [Exporting hardware inventory to a network share](#)

Exporting hardware inventory to a USB drive

To export hardware-related inventory to a USB drive:

1. From the **Select Device** drop-down menu, select a USB drive.
2. In the **File Path** box, type a valid directory or subdirectory path on the device. For example, **2011\Nov**. If the path is not provided, the file is stored in the root location of the device.

 **NOTE:** Lifecycle Controller allows 256 characters in a path that includes the file name and file extension. For example, if 56 characters are used for file name and extension, only 200 characters can be used for the path. Lifecycle Controller does not support these characters -;, *,?,"<, >, |, #, %, ^, and SPACE.

Exporting hardware inventory to a network share

To export to a network share, select **CIFS** or **NFS** and type the required details.

Related Links

- [CIFS](#)
- [NFS](#)

CIFS

For CIFS, type the following details:

- **Share Name** — Type the shared folder path to export the file to that folder. For example, type **\192.168.20.26\sharename** or **\\servername\sharename**.

- **Domain and User Name** — Type the domain and user name required to log on to the network share. For example, loginname@myDomain or domain\user name. If there is no domain, type the user name.
- **Password** — Type the correct password.
- **File Path** — Type the sub-directories, if any. For example, 2011\Nov.
 - ✎ **NOTE:** Lifecycle Controller allows 256 characters in a path that includes the file name and file extension. For example, if 56 characters are used for file name and extension, only 200 characters can be used for the path. Lifecycle Controller does not support these characters -;, *,?,"',<,>,|, #, %, ^, and SPACE.

NFS

For NFS, type the following details:

- **Share Name** — Type the shared folder path to export the file to that folder. For example, \\xxx.xxx.xx.xx\sharename.
- **File Path** — Type the subdirectories path, if any. For example, 2011\Nov.
 - ✎ **NOTE:** Lifecycle Controller allows 256 characters in a path that includes the file name and file extension. For example, if 56 characters are used for file name and extension, only 200 characters can be used for the path. Lifecycle Controller does not support these characters -;, *,?,"',<,>,|, #, %, ^, and SPACE.

Viewing or exporting hardware inventory after part replacement

To view or export the hardware inventory after part replacement:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Hardware Configuration**.
3. In the right pane, click **Hardware Inventory**.
4. Click **View Current Inventory**.
Lifecycle Controller displays the old hardware inventory.
5. Restart the server and relaunch Lifecycle Controller.
6. On the **Hardware Inventory** page, click **View Current Hardware Inventory** to view the latest inventory, or click **Export Current Inventory** to export the latest inventory to an external location.

✎ **NOTE:** For more information about the part replacement feature, see the *Part Replacement in Lifecycle Controller* white paper at delltechcenter.com/lc.

Related Links

[About view and export current inventory](#)

Viewing and exporting current inventory after resetting Lifecycle Controller

✎ **NOTE:** The system automatically turns off after you select the **Repurpose or Retire System** option.

To view or export the current hardware inventory data after resetting Lifecycle Controller:

1. Turn on the system and wait for a few minutes for iDRAC to start functioning.
2. Press <F10> during POST to start Lifecycle Controller and the system inventory is collected as Collect System Inventory On Restart (CSIOR) is enabled by default.

3. After Lifecycle Controller starts, click **Hardware Configuration** → **View Current Hardware Inventory** or **Export Current Hardware Inventory** to view or export current hardware inventory respectively. If the following message is displayed, click **No**, reboot the system, and then retry.

Hardware change is detected on the system. The current hardware inventory does not contain the latest updates as the hardware inventory update is in progress. To view or export the latest hardware inventory, relaunch Lifecycle Controller and retry. Do you want to continue with the old current hardware inventory information?

Related Links

[Viewing hardware inventory – current or factory shipped](#)

[Exporting hardware inventory – current or factory shipped](#)

Lifecycle Controller log

Lifecycle Controller Log provides a record of past activities on a managed system. Using the **Lifecycle Log** wizard, you can view and export life cycle log, and add a work note to a log history. The log contains the following:

- Firmware update history based on device, version, and date and time.
- Events based on category, severity, and date and time.
- User comments history based on date and time.

Related Links


[Viewing Lifecycle Log history](#)

[Exporting Lifecycle Log](#)


[Adding a work note to the Lifecycle Log](#)

Viewing Lifecycle Log history

Use the **Lifecycle Log** feature to view:

- System event logs
- History of firmware updates
-  **NOTE:** The details of the configuration changes are not displayed.
- User work notes

You can use the filtering and sorting options to view the Lifecycle Log.

 **NOTE:** As the system events are generated by various systems management tools, you may not view the events in log immediately after they were logged.


To view the Lifecycle Log history and use the filtering options:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Lifecycle Log**.
3. In the right pane, click **View Lifecycle Log History**.

The following details are displayed:

- **No.** – The serial number of the event.
- **Category** – The category to which the events belong. The available categories are:

- **All** — Events related to all categories are listed.
- **System Health** — Events related to the installed hardware such as fan, PSUs, NIC/LOM/CNA link, BIOS errors, and so on.
- **Storage** — Events related to the external or internal storage components such as storage controller, enclosure, HDDs, and software RAID.
- **Configuration** — Events related to the hardware and software changes such as addition or removal of hardware in the system, configuration changes made using Lifecycle Controller or system management tools.
- **Audit** — Events related to a user login, intrusion, licenses, and so on.
- **Updates** — Events related to updates or rollback of firmware and drivers.
- **Work Notes** — Events logged by you.


 **NOTE:** These options are available in the **Filter by Category** drop-down menu. Select the category to filter the data depending on the category option selected.


- **Severity**
 - **Critical** — Indicates the events that are business-critical.
 - **Informational** — Indicates the events that are generated only for information purpose.
- **Message ID** — Each event is represented with a unique Message ID. For example, **SWC0001**.
- **Description** — A brief description about the event. For example, `Dell OS Drivers Pack, v. 6.4.0.14, X14 was detected.`
- **Date and Time** — Indicates the date and time when an event occurred.

Exporting Lifecycle Log

Use the **Export Lifecycle Log** feature to export the Lifecycle Log information to a compressed file (.gz format) that has log files in an .xml file. You can save the XML file in a USB drive or on a network share. For more information about the schema, see en.community.dell.com/techcenter/extras/m/white_papers/20270305. Before exporting the Lifecycle Log, make sure that the following prerequisites are met:

- To export the file to a USB drive, make sure that a USB drive is connected to the managed server.
- To export the file to a network share (shared folder), set the correct network settings. For more information, see [Configuring Network Settings For A NIC](#).

 **NOTE:** As the system events are generated by various systems management tools, you may not view the events in log immediately after they were logged.


 **NOTE:** The log data is exported to a compressed file (.gz format) only if iDRAC version 1.50.50 or later is installed. Else, the data is exported as an .xml file.

To export the Lifecycle Log:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Lifecycle Log**.
3. In the right pane, click **Export Lifecycle Log**.
4. Select either **USB Drive** or **Network Share**.

For more information, see [Exporting Lifecycle Log To A USB Drive](#) or [Exporting Lifecycle Log To A Network Share](#).

If you select **Network Share**, click **Test Network Connection** to verify if Lifecycle Controller is able to connect to the IP address that you have provided. By default, it pings the Gateway IP, DNS server IP, and host IP.

 **NOTE:** Lifecycle Controller cannot ping the domain name and cannot display the IP address if the DNS is not able to resolve the domain name. Make sure that the issue with DNS is resolved and retry.

5. Click **Finish**.

The Lifecycle Log is exported to the specified location.

Related Links

[Exporting hardware inventory to a USB drive](#)


[Exporting hardware inventory to a network share](#)

Exporting Lifecycle Log to a USB drive

To export the Lifecycle Log to a USB drive:

1. From the **Select Device** drop-down menu, select a USB drive.
2. In the File path box, type a valid directory or subdirectory path on the device. If the path is not provided, the file is stored in the root location of the device.

For example, **2014\Nov**.

 **NOTE:** Lifecycle Controller allows 256 characters in a path that includes the file name and file extension. For example, if 56 characters are used for file name and extension, only 200 characters can be used for the path. Lifecycle Controller does not support these characters -:, *,?,",<,>|, #,% ^, and SPACE.


Exporting Lifecycle Log to a network share

To export to a network share, select **CIFS** or **NFS** and type the required details.

CIFS

For CIFS, type the following details:


- **Share Name** — Type the shared folder path to export the file to that folder. For example, type `\192.168.20.26\sharename` or `\\servername\sharename`.
- **Domain and User Name** — Type the domain and user name required to log on to the network share. For example, `loginname@myDomain` or `domain\user name`. If there is no domain, type the user name.
- **Password** — Type the correct password.
- **File Path** — Type the sub-directories, if any. For example, `2011\Nov`.

 **NOTE:** Lifecycle Controller allows 256 characters in a path that includes the file name and file extension. For example, if 56 characters are used for file name and extension, only 200 characters can be used for the path. Lifecycle Controller does not support these characters -:, *,?,",<,>|, #,% ^, and SPACE.

NFS


For NFS, type the following details:

- **Share Name** — Type the shared folder path to export the file to that folder. For example, `\\xxx.xxx.xx.xx\sharename`.
- **File Path** — Type the subdirectories path, if any. For example, `2011\Nov`.

 **NOTE:** Lifecycle Controller allows 256 characters in a path that includes the file name and file extension. For example, if 56 characters are used for file name and extension, only 200 characters can be used for the path. Lifecycle Controller does not support these characters -:, *,?,",<,>|, #,% ^, and SPACE.

Adding a work note to the Lifecycle Log

You can add a work note to the Lifecycle Log to record comments for your reference. You can enter comments such as scheduled downtime or changes made by administrators who work in different shifts for later reference.

 **NOTE:** You can type a maximum of 50 characters in the **Lifecycle Log** field. The special characters such as <, >, &, and % are not supported.

To add a work note:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Lifecycle Log**.
3. In the right pane, click **Add a work note to Lifecycle Log**.
4. In the **Enter a work note** field, enter the comments and click **OK**.

Firmware update

Using Lifecycle Controller, the system can be updated using the repositories accessible through FTP or on a locally attached USB drive, DVD, or network share. Use the **Firmware Update** page to:

- View the current version of the installed applications and firmwares.
- View a list of available updates.
- Select the required updates, downloads (automatic), and then apply the updates to the following components listed in the table.

The following table lists the components that support the **Firmware Update** feature.


 **NOTE:** When multiple firmware updates are applied through out-of-band methods or using the Lifecycle Controller GUI, the updates are ordered in the most efficient possible manner to reduce unnecessary restarting of a system.

Table 3. Firmware Update — Supported Components

Component Name	Firmware Rollback Supported? (Yes or No)	Out-of-band — System Restart Required?	In-band — System Restart Required?	Lifecycle Controller GUI — Restart Required?
Diagnostics	No	No	No	No
OS Driver Pack	No	No	No	No
BIOS	Yes	Yes	Yes	Yes
RAID Controller	Yes	Yes	Yes	Yes
Backplanes	Yes	Yes	Yes	Yes
Enclosures	Yes	Yes	No	Yes
NIC	Yes	Yes	Yes	Yes
iDRAC	Yes	No	*No	Yes
Power Supply Unit	Yes	Yes	Yes	Yes
CPLD	No	Yes	Yes	Yes
FC Cards	Yes	Yes	Yes	Yes
PCIe SSD	Yes	Yes	Yes	Yes

* Indicates that though a system restart is not required, iDRAC must be restarted to apply the updates. iDRAC communication and monitoring will temporarily be interrupted.

Related Links

[Firmware update methods](#)

[Version compatibility](#)

Firmware update methods

The following table lists the various locations or media and methods to perform the updates:


 **NOTE:** If the FTP server or network share is used for updates, configure the network card using the **Settings** wizard before accessing the updates.

Table 4. Firmware Update Methods

Location	FTP
Methods	<ul style="list-style-type: none">• Non-proxy (Internal or Service Provider)• Proxy (Internal or Service Provider)
Media	Local Drive <ul style="list-style-type: none">• SUU DVD• USB Drive
Methods	<ul style="list-style-type: none">• Virtual Console (Mapped on Client)• Attached Locally
Location	Network Share <ul style="list-style-type: none">• CIFS• NFS

Version compatibility


The version compatibility feature enables you to update the component firmware versions that are compatible with system components. In case of compatibility issues, Lifecycle Controller displays upgrade or downgrade error messages during the update.


Updating firmware

You can update to the latest version of Lifecycle Controller using the **Firmware Update** wizard. It is recommended that you run the **Firmware Update** wizard regularly to access the latest updates. You can update the component firmware by either using update repositories or individual DUPs (single component DUP).

 **NOTE:** The firmware for iDRAC and Lifecycle Controller is combined in a single package.

 **NOTE:** Make sure that the file name for the single component DUPs does not have any blank space.


 **NOTE:** If Collect System Inventory On Restart (CSIOR) is disabled while performing an update, Lifecycle Controller automatically updates the system inventory.

 **NOTE:** Both 32-bit and 64-bit DUPs and catalog are supported. If both the 32-bit and 64-bit DUPs are available in a catalog, the 64-bit DUP is preferred for the firmware update. 32-bit DUP is used for firmware update only when 64-bit DUP is not available in a catalog.

To update the firmware:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Firmware Update**.
3. In the right pane, click **Launch Firmware Update**.
4. To indicate the repository where the firmware file is stored, select any one of these update repositories: **FTP Server**, **Local Drive(CD or DVD or USB)**, or **Network Share**, click **Next**.

The **Enter Access Details** page is displayed.


 **NOTE:** If you select **Network Share**, click **Test Network Connection** to verify if Lifecycle Controller is able to connect to the IP address that you have provided. By default, it pings the Gateway IP, DNS server IP, and host IP. Lifecycle Controller cannot ping the domain name and does not display its IP address, if the DNS is not able to resolve the domain name. Make sure that the issue with DNS is resolved and retry.


5. Type or select the appropriate data.
6. Click **Next**.


The **Select Updates** page is displayed with the catalog file, catalog version, and component names for which the updates are available.


7. Select the components that require an update, and then click **Apply**.

The update process is initiated and the firmware update is completed. After restart, the system is ready to use.

 **NOTE:** The system does not restart if operating system driver packs, OS collector tool, or hardware diagnostics are updated.

 **NOTE:** When applying more than one update, the system may restart between updates. In this case, Lifecycle Controller restarts the server and automatically continues the update process.

 **NOTE:** iDRAC resets while updating iDRAC. If the iDRAC firmware update is interrupted for any reason, wait for up to 30 minutes before you attempt another firmware update.

 **NOTE:** After the CPLD firmware is updated on the modular servers, on the **View Current Versions** page, under **Firmware Update**, the firmware update date is displayed as 2000-01-01, regardless of the actual update date. The updated date and time are displayed based on the time zone that is configured on the server.

Related Links

[Firmware update](#)

[Firmware update methods](#)

[Version compatibility](#)


[Selecting the type of update and update source](#)

[Selecting and applying updates](#)


[Updating or rolling back devices that affect Trusted Platform Module settings](#)

Selecting the type of update and update source

To perform the updates, you can download single component DUPs or repository (**Catalog.xml**) using the **Firmware Update** wizard to one of the following:

 **NOTE:** The **Catalog.xml** file contains the individual server bundles. Each bundle consists of all the DUP information (md5 security key, date and time, path, Release ID, version, and so on).

- FTP server — Dell FTP Server, Local FTP, or FTP server using a proxy server.

 **NOTE:** Make sure that the repository (catalog file) and DUPs are copied to the root folder of the source

- Local Drive — Use a USB drive, *Dell Server Updates DVD*, or *Lifecycle Controller OS Driver Packs DVD*
- Network Share

Related Links

- [Comparing firmware versions](#)
- [Using single component DUPs](#)
- [Using a local drive](#)
- [Using a FTP server](#)
- [Using a network share](#)
- [Updating or rolling back devices that affect Trusted Platform Module settings](#)

Using a local drive

Lifecycle Controller allows you to perform firmware updates using locally available DVDs or USB drives, or virtual media. This flexibility improves the efficiency of the update process when there is a high network traffic. After selecting the update repository, Lifecycle Controller automatically detects any necessary updates, and performs those updates on components you specifically select.

To access the repository on the local drive, create a repository on a DVD or USB drive and attach it to the server locally or using a virtual media.


Using a DVD


Use either the Server Update Utility (SUU) DVDs or custom DVDs (SUU ISO downloaded from **dell.com/support** and written to a DVD) to perform the firmware updates. The available DVDs are:


- *OpenManage SUU* DVD to update all the server components such as Lifecycle Controller, Dell Diagnostics, BIOS, RAID controller, NIC, iDRAC, and Power Supply Unit.
- *Lifecycle Controller OS Driver Packs* DVD (Windows only) to update the operating system driver packs.

To access the updates from a DVD:

1. Insert the appropriate DVD in the locally attached CD/DVD drive. Alternatively, insert the appropriate DVD in the client and use the **Virtual Media** feature to access the attached CD/DVD drive. For more information, see the *iDRAC User's Guide* at **dell.com/support/home**.
2. From the **Local Drive** drop-down menu, select the drive that contains the updated DVD.
3. In the **File Path or Update package path** field, enter the location or subdirectory where the catalog is available.

 **NOTE:** If the catalog file is located in the root folder, do not enter the file name in the **File Path** or **Update package path** field. However, if the catalog file is located in a subdirectory, enter the subdirectory name.

 **NOTE:** If the catalog file or DUP is downloaded from **ftp.dell.com**, do not copy them to a subdirectory.


 **NOTE:** Lifecycle Controller allows 256 characters in a path that includes the file name and file extension. For example, if 56 characters are used for file name and extension, only 200 characters can be used for the path. Lifecycle Controller does not support these characters -:, *,?,",<,>,|,#,%,^, and SPACE.

Using a USB drive

You can download the repository from the SUU DVD or from an FTP location to a USB drive, and then access the updates from this drive.

Before downloading the repository to the USB drive, make sure that the following prerequisites are met:


- The updates are downloaded using the **Dell Repository Manager** and the repository is created on a USB drive.


 **NOTE:** To download the complete repository, make sure that the USB drive has 8 GB free space.


- Connect the USB drive to the system.

To update using a USB drive:

1. Insert a USB drive to the managed system. Alternatively, you can insert the USB drive to the client system and use the **Virtual Media** feature to access the USB drive. For more information about this feature, see the *iDRAC User's Guide* at dell.com/support/home.
2. From the **Select Device** drop-down menu, select the USB drive that contains the updates (DUP or repository).
3. In the **File Path or Update package path** field, type the location or subdirectory where the catalog file is available.

 **NOTE:** If the catalog file is located in a root folder, do not enter the file name in the **File Path or Update package path** field. However, if the catalog file is located in a subdirectory, enter the subdirectory name.

 **NOTE:** If the catalog file or DUP is downloaded from **ftp.dell.com**, do not copy them to a subdirectory.

 **NOTE:** Lifecycle Controller allows 256 characters in a path that includes the file name and file extension. For example, if 56 characters are used for file name and extension, only 200 characters can be used for the path. Lifecycle Controller does not support these characters - ; , * ? , " < , > , | , # , % , ^ , and SPACE.

Using a FTP server

Lifecycle Controller provides options to update a server using the latest firmware available on the Dell FTP server or internal FTP server. To use the Dell FTP, local FTP, or service provider's FTP server that is configured as proxy or non-proxy, use the following options:

- Using Non-Proxy FTP Server
- Using Proxy FTP Server

Related Links

[Accessing updates on a local FTP server](#)

[Configuring a local USB drive](#)

Using a non-proxy FTP server

Lifecycle Controller can access the latest firmware from **ftp.dell.com**. It downloads the DUPs from this location to perform firmware update.

Before performing an update using a non-proxy FTP server, make sure that the following prerequisites are met:


- The network settings are configured (**Settings** → **Network Settings**).


- The updates are downloaded using **Dell Repository Manager**, and the repository is created on an internal FTP server.


To update the system using the Dell FTP server, internal FTP server, or service provider's FTP server:

- Dell FTP Server — In the **Address** field, enter only **ftp.dell.com**.
- Internal FTP server or service provider's FTP server — Enter the following details:
 - **User Name** — The user name to access the FTP location.
 - **Password** — The password to access the FTP location.
 - **File Path or Update package path** — Name of the DUP location or subdirectory where the catalog is available.

This step is optional for operating system driver source.

 **NOTE:** If the catalog file is located in the root folder, do not enter the file name in the **File Path** or **Update package path** field. However, if the catalog file is located in a subdirectory, enter the subdirectory name.

 **NOTE:** If the catalog file or DUP is downloaded from **ftp.dell.com**, do not copy them to a subdirectory.

 **NOTE:** Lifecycle Controller allows 256 characters in a path that includes the file name and file extension. For example, if 56 characters are used for file name and extension, only 200 characters can be used for the path. Lifecycle Controller does not support these characters -: *,?,",<,>,|,#,%^, and SPACE.

Using a proxy FTP server


Using Lifecycle Controller, you can update the firmware by using **ftp.dell.com**, or by using an internal FTP server or service provider's FTP server, when you are connected to the Internet through a proxy server.



Before performing an update using a proxy FTP server, make sure that the following prerequisites are met:

- The network settings are configured (**Settings** → **Network Settings**).
- The updates are downloaded using the **Dell Repository Manager**, and the repository is created on an internal FTP server.
- The proxy server supports either HTTP or SOCKS4 protocols.
- Information related to proxy server such as IP address or host name of the proxy server, login credentials, and the port number are readily available.

To update the system using the Dell FTP server or an internal FTP server, or service provider's FTP server in a proxy environment:

- Dell FTP Server — In the **Address** field, enter **ftp.dell.com**, and under the **Proxy Settings** section, enter the proxy server information.
- Internal FTP server or service provider's FTP server — Enter the following details:
 - **User Name** — The user name to access the FTP location.
 - **Password** — The password to access the FTP location.
 - **File Path or Update package path** — Name of the DUP location or subdirectory where the catalog is stored.




 **NOTE:** If the catalog file is located in the root folder, do not enter the file name in the **File Path** or **Update package path** field. However, if the catalog file is located in a subdirectory, enter the subdirectory name (for example, subdirectory).

-  **NOTE:** If the catalog file or DUP is downloaded from **ftp.dell.com**, do not copy them to a subdirectory.
-  **NOTE:** Lifecycle Controller allows 256 characters in a path that includes the file name and file extension. For example, if 56 characters are used for file name and extension, only 200 characters can be used for the path. Lifecycle Controller does not support these characters -: *,?,",<,>,|,#,%^, and SPACE.
- **Enable Settings** — Select this option to enter the following details:
 - **Server** — The host name of the proxy server.
 - **Port** — The port number of the proxy server.
 - **User Name** — The user name required to access the proxy server.
 - **Password** — The password required to access the proxy server.
 - **Type** — The type of proxy server. Lifecycle Controller supports HTTP and SOCKS 4 proxy server types.

Using a network share

To use a shared folder over a network, select **Network Share (CIFS or NFS)** and enter the details provided in the following table:


Table 5. Network Share Details

For CIFS	For NFS
Share Name — Path to the shared folder where the DUPs or repository is located. For example, <code>\192.168.20.26\sharename</code> or <code>\\servername\sharename</code> .	
Domain and User Name — Type the correct domain and user name required to log on to the network share. For example, <code>login-name@myDomain</code> , and if there is no domain, type only the login name. For example, <code>login-name</code> .	NA
Password — Password to access the share.	NA
File Path or Update package path — Name of the DUP location or subdirectory, where the catalog is stored.	
 NOTE: If the catalog file is located in the root folder, do not enter the filename in the File Path or Update package path field. However, if the catalog file is located in a subdirectory, enter the subdirectory name.	
 NOTE: If the catalog file and DUP are downloaded from ftp.dell.com , do not copy them to a subdirectory.	
 NOTE: Lifecycle Controller allows 256 characters in a path that includes the file name and file extension. For example, if 56 characters are used for file name and extension, only 200 characters can be used for the path. Lifecycle Controller does not support these characters -: *,?,",<,>, ,#,%^, and SPACE.	


Using single component DUPs

To use single component Dell Update Packages (DUP), download the Dell Update Package (only .exe) from the Dell FTP site (**ftp.dell.com**), or copy from the *Server Update Utility* DVD, or from **dell.com/support** to a local hard-disk drive or network share.

-  **NOTE:** Make sure that the file name for the single component DUPs does not have any blank space.

 **NOTE:** Both 32-bit and 64-bit DUPs are supported.

In the **File Path or Update package** path field, enter the name of the DUP (for example, **APP_WIN_RYYYYZZZ.EXE**) or if the DUP is present in a subdirectory, enter both the subdirectory name and name of the DUP (for example, **subdirectory\APP_WIN_RYYYYZZZ.EXE**).

 **NOTE:** Lifecycle Controller allows 256 characters in a path that includes the file name and file extension. For example, if 56 characters are used for file name and extension, only 200 characters can be used for the path. Lifecycle Controller does not support these characters -:, *,?,",<,>|, #,% ^, and SPACE.

Selecting and applying updates


1. To select and apply the updates, from the **Available System Updates** table, select the check box corresponding to the component that has the firmware you want to update. After you select the catalog ID details, of the firmware selected are displayed in the following format:


Release Date: YYYY-MM-DD

Source: USB Drive or CD or DVD (<device type>): \<firmware file name in .exe format>.

By default, Lifecycle Controller selects the components for which the current updates are available.


2. Click **Apply**. The system may restart after the update process is complete. When applying more than one update, the system may restart between the updates and launch back to Lifecycle Controller, and continue with the other selected updates.

 **NOTE:** The system does not restart after updating the operating system driver pack and hardware diagnostics.

 **NOTE:** While using Lifecycle Controller to update the power supply unit (PSU) firmware, the system turns off after the first task. It takes a couple of minutes to update the PSU firmware, and then automatically turns on the server.

Firmware rollback

Lifecycle Controller allows you to roll back to a previously installed version of component firmware such as BIOS, iDRAC with Lifecycle Controller, RAID Controller, NIC, Enclosure, Backplane, Fibre Channel cards, and Power Supply Unit (PSU). Use this feature if you have a problem with the current version, and want to revert to the previously-installed version.

 **NOTE:** On the 13th generation of PowerEdge servers that have a single iDRAC and Lifecycle Controller firmware, rolling back iDRAC firmware will also rollback Lifecycle Controller.


- Dell Diagnostics, operating system driver packs, CPLD, and operating system collector tool cannot be rolled back to earlier versions.
- The earlier version is available only if the component firmware is updated at least once to a different version.
- Every time a firmware image is updated, the earlier version of the firmware image is backed up.
- Every time a rollback operation is performed, the previously installed firmware becomes the current version. However, for iDRAC, the previously installed version becomes the current version and the current version is stored as the previous version.
- The earlier version of the firmware is available only if any of the following tools are used to update the firmware: Lifecycle Controller **Firmware Update** feature, Lifecycle Controller-Remote Services, or the Dell Update Package (DUP) from operating system.

Related Links

[Rolling back to previous firmware versions](#)

Rolling back to previous firmware versions

You can roll back to earlier versions of a firmware using the **Firmware Rollback** wizard.

 **NOTE:** If you update any firmware only once, the rollback feature provides the option to revert to the factory-installed component firmware image. If you update the firmware more than once, the factory-installed images are overwritten and you cannot revert to them.

To roll back a firmware:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Firmware Update**.
3. In the right pane, click **Launch Firmware Rollback**.
The **Firmware Rollback** page displays a list of components for which roll back is available and the later versions are selected by default.
4. Select the required rollback image and click **Apply**.
After the update process is complete, the system may restart. When applying more than one update, the system may restart between updates and launch back to Lifecycle Controller and continue updating.

Related Links

[Firmware rollback](#)

[Comparing firmware versions](#)

[Updating or rolling back devices that affect Trusted Platform Module settings](#)

Comparing firmware versions

To compare the version of the update or rollback with the version currently installed on the system, compare the versions in the **Current** and **Available** fields:

- **Component** — Displays the name of the components. Select the check box corresponding to the component that you want to update.
- **Current** — Displays the component version currently installed on the system.
- **Available** — Displays the version of the available firmware.

Updating or rolling back devices that affect Trusted Platform Module settings

Enabling Trusted Platform Module (TPM) with pre-boot measurement enables the BitLocker protection on the system. When BitLocker protection is enabled, updating or rolling back the components such as RAID controller, NIC, and BIOS require that a recovery password is entered or a USB drive that contains a recovery key is inserted during the next system restart. For information on how to set TPM settings, see the *BIOS User Guide* available at dell.com/support/home.

When Lifecycle Controller detects that TPM security is set to **On with Pre-boot Measurements**, a message indicates that certain updates require the recovery password or USB drive with the recovery key. The message also indicates components that affect the BitLocker.

You can choose not to update or roll back those components by navigating to the **Select Updates** page, and then clearing the options for the appropriate components.

Configure

Lifecycle Controller provides various system configuration wizards. Use the configuration wizards to configure system devices. The Configuration Wizards has:

- **System Configuration Wizards** — This wizard includes **LCD Panel Security**, **iDRAC Settings**, **System Date and Time Configuration**, and **vFlash SD card Configuration**.
- **Storage Configuration Wizards** — This wizard includes **RAID Configuration**, **Key Encryption**, and **Break Mirror**.

Related Links

- [Controlling access to the front panel](#)
- [Configuring iDRAC](#)
- [Configuring system time and date](#)
- [Configuring vFlash SD card](#)
- [Configuring RAID](#)
- [Configuring RAID using software RAID](#)
- [Creating a secure virtual disk on a RAID controller](#)
- [Applying the local key on a RAID controller](#)
- [Breaking mirrored drives](#)

System control panel access options

Lifecycle Controller front panel security configuration enables an administrator to restrict access to system control panel interface. The options available are:

- **View and Modify** — You can obtain information and make changes using the system control panel interface.
- **View Only** — You can move through the data screens to obtain information using the system control panel interface.
- **Disable** — You do not have access to information or control, other than the information displayed by the management controller, and you cannot specify actions.

Controlling access to the front panel


To control access to the front panel:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. From the Lifecycle Controller **Home** page, select **Hardware Configuration**.
3. In the right pane, select **Configuration Wizards**.
4. On the **System Configuration Wizards** page, click **LCD Panel Security**.
5. Set **System Control Panel Access** to one of the following options:
 - **View and Modify**
 - **View Only**

- **Disable**
6. Click **Finish** to apply the changes.

Configuring iDRAC


To configure iDRAC parameters applicable to the system, such as LAN, common IP settings, IPv4, IPv6, Virtual Media, and LAN user configuration use the **iDRAC Settings** wizard.

 **NOTE:** You can also use the **System Setup** utility during startup for configuring iDRAC. For more information about the **System Setup** utility, see [Using The System Setup Program And Boot Manager](#).

To configure and manage the iDRAC parameters:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane of **Home** page, click **Hardware Configuration**.
3. In the right pane, click **Configuration Wizards**.
4. On the **System Configuration Wizards** page, click **iDRAC Settings**, and then click the following options to configure the different iDRAC parameters.

For more information about configuring iDRAC settings, see the *iDRAC User's Guide* at dell.com/support/home.

 **NOTE:** Click **System Summary** to view the parameters and their values.

- **Network**
 - **OS to iDRAC Pass Through**
 - **Alerts**
 - **System Event Log**
 - **Virtual Media**
 - **vFlash Media**
 - **Thermal**
 - **System Location**
 - **Front Panel Security**
 - **User Configuration**
 - **Smart Card**
 - **Lifecycle Controller**
 - **Remote Enablement**
 - **Reset iDRAC Configuration to defaults**
5. Click **Back** after setting the parameters for each option to return to the main menu.
 6. Click **Finish** to apply the changes.

Configuring system time and date

To set the time and date for the managed system:


1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. From the Lifecycle Controller **Home** page, select **Hardware Configuration**.
3. In the right pane, select **Configuration Wizards**.
4. Under **System Configuration Wizards**, click **System Time and Date Configuration**.

The default system time and system date displayed in Lifecycle Controller is the date and time reported by the system BIOS.

5. Modify the **System Time** and **System Date** (HH:MM:SS AM or PM), as required.
6. Click **Finish** to apply the changes.

Configuring vFlash SD card

Use the licensed feature to enable or disable the vFlash SD card, check the health and properties, and initialize the vFlash SD card. Lifecycle Controller support vFlash SD cards of sizes 1 GB, 2 GB, 8 GB, 16 GB, and 32 GB.


 **NOTE:** The options under vFlash SD card are grayed-out if there is no SD card inserted in the slot.

See the *Integrated Dell Remote Access Controller (iDRAC) User's Guide* available at dell.com/support/home for more information on vFlash SD card and the installation procedure.

Use the vFlash SD card configuration feature to:

- Enable or disable vFlash SD card.
- Determine the vFlash SD card properties:
 - **Name** — Displays the name of the vFlash SD card.
 - **Health** — Displays health states such as **OK**, **Warning**, and **Critical**.
 - **Size** — Indicates the total size of the vFlash SD card.
 - **Available Space** — Indicates the available size on the vFlash SD card to create a new partition.
 - **Write Protected** — Indicates if the write-protect latch on the vFlash SD card is set to on or off position.
- **Initialize vFlash** — Deletes all the existing partitions on the vFlash SD card.

Enabling or disabling a vFlash SD card

 **NOTE:** Make sure to set the write-protect latch on the vFlash SD card to the off position.

If set to **Enabled**, the vFlash SD card appears in the BIOS boot order, allowing you to boot from the vFlash SD card. If set to **Disabled**, virtual flash is not accessible.

To enable or disable a vFlash SD card:


1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Hardware Configuration**.
3. In the right pane, click **Configuration Wizards**.
4. Under **System Configuration Wizards**, click **vFlash SD Card Configuration**.
The **vFlash SD Card** page is displayed.
5. From the **vFlash SD card** drop-down menu, select **Enabled** or **Disabled**.
6. Click **Finish** to apply the changes.

Initializing a vFlash SD card

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Hardware Configuration**.
3. In the right pane, click **Configuration Wizards**.


4. On the **System Configuration Wizards** page, click **vFlash SD Card Configuration**.
The **vFlash SD Card** page is displayed.


5. Click **Initialize vFlash** to delete all the data present in the vFlash SD card.

 **NOTE:** The **Initialize vFlash** option is not available after you disable the vFlash SD card.

Configuring RAID

If your system has one or more supported PERC RAID controllers with PERC 8 firmware or later, or software RAID controllers, use the **RAID Configuration** wizard to configure a virtual disk as the boot device.

 **NOTE:** Create boot virtual disk only from disk drive populated across slots 0–3 of the system. For slot information, see the Dell PowerEdge Owner's Manual dell.com/poweredgemanuals.

 **NOTE:** If there are any internal storage controller cards on the system, all other external cards cannot be configured. The external cards can be configured only if there are no internal cards.

To configure RAID:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Hardware Configuration**.
3. In the right pane, click **Configuration Wizards**.
4. Under **Storage Configuration Wizards**, click **RAID Configuration** to launch the wizard.
The **View Current RAID Configuration and Select Controller** page is displayed.
5. Select the controller and click **Next**.
The **Select RAID Level** page is displayed.
6. Select the RAID level and click **Next**.
The **Select Physical Disks** page is displayed.
7. Select the physical disk's properties and click **Next**.
The **Virtual Disk Attributes** page is displayed.
8. Select the virtual disk parameters and click **Next**.
The **Summary** page is displayed.
9. To apply the RAID configuration, click **Finish**.

Related Links

[Viewing current RAID configuration](#)
[Selecting a RAID controller](#)
[Foreign configuration found](#)
[Selecting RAID levels](#)
[Selecting physical disks](#)
[Setting virtual disk attributes](#)
[Viewing summary](#)

Foreign configuration found

The **Foreign Configuration Found** page is displayed only if a foreign configuration physical disk drive resides on the selected RAID controller or any uninitialized physical disk drives present on the system.

A foreign configuration is a set of physical disk drives containing a RAID configuration that is introduced to the system, but is not managed by the RAID controller to which it is attached. You may have a foreign

configuration if physical disk drives have been moved from one RAID controller to another RAID controller.

You have two options: **Ignore Foreign Configuration** and **Clear Foreign Configuration**.

- If the foreign configuration contains data that you require, click **Ignore Foreign Configuration**. If you click this option, the disk drive space containing the foreign configuration is not available for use in a new virtual drive.
- To delete all data on the physical disk drives containing the foreign configuration, click **Clear Foreign Configuration**. This option deletes the hard-disk drive space containing the foreign configuration and makes it available for use in a new virtual drive.

After selecting one of the above options, click **Next**.

Viewing current RAID configuration

The **View Current RAID Configuration and Select Controller** page displays the attributes of any virtual disks already configured on the supported RAID controllers attached to the system. You have two options:

- Accept the existing virtual disks without changing. To select this option, click **Back**. If you have to install the operating system on an existing virtual disk, make sure that the virtual disk size and RAID level are correct.
- Use the **RAID configuration** wizard to delete all the existing virtual disks and create a single new virtual disk to be used as the new boot device. To select this option, click **Next**.
 - ✎ **NOTE:** RAID 0 does not provide data redundancy and hot spare. Other RAID levels provide data redundancy and enable you to reconstruct data in the event of a disk-drive failure.
 - ✎ **NOTE:** You can create only one virtual disk using Lifecycle Controller. To create multiple virtual disks, use Option ROM. To access Option ROM, press **<Ctrl> <R>** during boot or POST.

Selecting a RAID controller

The **View Current RAID Configuration and Select Controller** page displays all supported RAID controllers attached to the system. Select the RAID controller on which you want to create the virtual disk, and then click **Next**.

Selecting RAID levels

Select a **RAID Level** for the virtual disk:

- **RAID 0** — Stripes data across the physical disks. RAID 0 does not maintain redundant data. When a physical disk fails in a RAID 0 virtual disk, there is no method for rebuilding the data. RAID 0 offers good read and write performance with zero data redundancy.
- **RAID 1** — Mirrors or duplicates data from one physical disk to another. If a physical disk fails, data can be rebuilt using the data from the other side of the mirror. RAID 1 offers good read performance and average write performance with good data redundancy.
- **RAID 5** — Stripes data across the physical disks, and uses parity information to maintain redundant data. If a physical disk fails, the data can be rebuilt using the parity information. RAID 5 offers good read performance and slower write performance with good data redundancy.
- **RAID 6** — Stripes data across the physical disks, and uses two sets of parity information for additional data redundancy. If one or two physical disks fail, the data can be rebuilt using the parity information. RAID 6 offers good data redundancy and read performance but slower write performance.

- **RAID 10** — Combines mirrored physical disks with data striping. If a physical disk fails, data can be rebuilt using the mirrored data. RAID 10 offers good read and write performance with good data redundancy.
- **RAID 50** — A dual-level array that uses multiple RAID 5 sets in a single array. A single physical disk failure can occur in each of the RAID 5 without any loss of data on the entire array. Although the RAID 50 has increased write performance, its performance decreases, data or program access gets slower, and transfer speeds on the array are affected when a physical disk fails and reconstruction takes place.
- **RAID 60** — Combines the straight block level striping of RAID 0 with the distributed double parity of RAID 6. The system must have at least eight physical disks to use RAID 60. Failures while a single physical disk is rebuilding in one RAID 60 set do not lead to data loss. RAID 60 has improved fault tolerance because more than two physical disks on either span must fail for data loss to occur.

Minimum disk requirement for different RAID levels

Table 6. RAID Level and Number of Disks

RAID Level	Minimum Number of Disks
0	1*
1	2
5	3
6	4
10	4
50	6
60	8

* For PERC S110 and S130 RAID controllers, a minimum of two hard-disk drives are required.

Selecting physical disks

Use the **Select Physical Disks** screen to select the physical disks to be used for the virtual drive and select the physical disk drive-related properties.

The number of physical disks required for the virtual disk varies depending on the RAID level. The minimum and maximum numbers of physical disks required for the RAID level are displayed on the screen.

- **Protocol** — Select the protocol for the disk pool: **Serial Attached SCSI (SAS)** or **Serial ATA (SATA)**. SAS drives are used for high performance, while SATA drives provide a more cost-effective solution. A disk pool is a logical grouping of physical disk drives on which one or more virtual drives can be created. The protocol is the type of technology used to implement RAID.
- **Media Type** — Select the media type for the disk pool: **Hard Disk Drives (HDD)** or **Solid State Disks (SSD)**. HDDs use traditional rotational magnetic media for data storage and SSDs implement flash memory for data storage.
- **Encryption Capability** — Select **Yes** to enable encryption capability.
- **Select Span Length** — Select the span length. The span length value refers to the number of physical disk drives included in each span. Span length applies only to RAID 10, RAID 50, and RAID 60. The **Select Span Length** drop-down list is active only if you have selected RAID 10, RAID 50, or RAID 60.

- **Drives remaining for current span** — Displays the number of physical disk-drives remaining in the current span based on the span length value selected.
- Select the physical disk-drives using the check boxes at the bottom of the screen. The physical disk-drive selection must meet the requirements of the RAID level and span length. To select all the physical disk-drives, click **Select All**. After you select the option, the option changes to **Deselect**.

Setting virtual disk attributes

Use this page to specify the values for the following virtual drive attributes:

- **Size** — Specify the size of the virtual drive.
- **Stripe Element Size** — Select the stripe element size. The stripe element size is the amount of drive space a stripe consumes on each physical-disk drive in the stripe. The **Stripe Element Size** list may contain more options than initially displayed on the screen. Use the up arrow and down arrow keys to view all available options.
- **Read Policy** — Select the read policy:
 - **Read Ahead** — The controller reads sequential sectors of the virtual drives when seeking data. The Read Ahead policy may improve system performance if the data is written to sequential sectors of the virtual drives.
 - **No Read Ahead** — The controller does not use the Read Ahead policy. The No Read Ahead policy may improve system performance, if the data is random and not written to sequential sectors.
 - **Adaptive Read Ahead** — The controller initiates the Read Ahead policy only if the most-recently-read requests accessed sequential sectors of the disk drive. If the most-recently-read requests access random sectors of the disk drive, then the controller uses the No Read Ahead policy.
- **Write Policy** — Select the write policy.
 - **Write Through** — The controller sends a write-request-completion signal only after the data is written to the disk drive. The Write Through policy provides better data security than the Write Back policy, because the system assumes that the data is available only after it has been written to the disk drive.
 - **Write Back** — The controller sends a write-request completion signal as soon as the data is in the controller cache, but has not yet been written to the disk drive. The Write Back policy may provide faster 'write' performance, but it provides less data security, because a system failure can prevent the data from being written to the disk drive.
 - **Force Write Back** — The write cache is enabled regardless of whether the controller has an operational battery. If the controller does not have an operational battery, data loss may occur in the event of a power failure.
- **Assign a Hot Spare Disk if available** — Select this option to assign a hot spare to the virtual drive. A hot spare is an unused backup physical disk drive that is used to rebuild data from a redundant virtual drive. A hot spare can be used only with a redundant RAID level. Hot spares also have physical disk-drive size requirements. The hot spare must be as large as or bigger than the smallest physical disk-drive included in the virtual drive. If the RAID level and physical disk-drive availability do not meet these requirements, a hot spare is not assigned.
 - ✎ **NOTE:** Assign a hot spare only from disk drives populated across slots 0–3 of the system. For slot information, see the Dell PowerEdge Owner's manual at dell.com/poweredgemanuals.
- **Hot Spare Disk** — Select a disk that is used as a hot spare. Only one dedicated hot spare is supported in Lifecycle Controller.
- **Secure Virtual Disk** — Select to secure the virtual drive using the controller's security key.
 - ✎ **NOTE:** The secure virtual drive is created only if the controller security key is created and the selected disks are Self-Encrypting Drives (SEDs).

Viewing summary

The **Summary** page displays the virtual disk attributes based on selections.

 **CAUTION:** Clicking **Finish** deletes all existing virtual drives except any foreign configurations that you specified. All data residing on the virtual drives is lost.


To return to a previous page to review or change selections, click **Back**. To close the wizard without making changes, click **Cancel**.

Click **Finish** to create a virtual drive with the displayed attributes.

Configuring RAID using software RAID


For the PERC S110 and S130 controllers, make sure to change the SATA settings in the system BIOS to **RAID Mode**. To change this setting using the BIOS, the latest BIOS version must be installed. For more information about the BIOS versions for different systems, see the *Lifecycle Controller Release Notes* at dell.com/support/home.

 **NOTE:** For more information about RAID configuration, see the *Creating RAID using Lifecycle Controller* white paper at delltechcenter.com/lc.

 **NOTE:** If you have an older BIOS, you can configure RAID only through Option ROM.

Use this feature to configure RAID, if a PERC S110 or S130 controller is enabled on the system. If the software RAID option is selected, Lifecycle Controller displays the physical disk-drives as Non-RAID disks or RAID-ready disks.

- Non-RAID disk — A single disk-drive without any RAID properties. Needs initialization to apply RAID levels.
- RAID-ready disk — The disk drive is initialized and a RAID level can be applied.


 **NOTE:** Linux and VMware operating systems cannot be installed using Software RAID controller (S110 and S130).

To configure software RAID:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Hardware Configuration**.
3. In the right pane, click **Configuration Wizards**.
4. Under **Storage Configuration Wizards**, click **RAID Configuration** to launch the wizard. The **View Current RAID Configuration and Select Controller** page is displayed.

5. Select the controller and click **Next**.

If the non-RAID disk drives are attached to the selected controller, select the non-RAID physical disk-drives, and then click **Next** to initialize them. Else, the **Select RAID Level** page is displayed.

 **NOTE:** During initialization, all the data on the non-RAID disk drives are deleted.

6. Select the RAID level and click **Next**. The **Select Physical Disks** page is displayed.
7. Select the physical disk properties and click **Next**. The **Virtual Disk Attributes** page is displayed.
8. Select the virtual disk parameters and click **Next**. The **Summary** page is displayed.

9. To apply the RAID configuration, click **Finish**.

Related Links

- [Selecting a RAID controller](#)
- [Foreign configuration found](#)
- [Selecting RAID levels](#)
- [Selecting physical disks](#)
- [Setting virtual disk attributes](#)
- [Viewing summary](#)


Creating a secure virtual disk on a RAID controller

Make sure that the controller is encrypted with a local key. For more information on encrypting with a local key, see [Key Encryption](#).

To create a secure virtual disk on a RAID controller:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Hardware Configuration**.
3. In the right pane, click **Configuration Wizards**.
4. Under **Storage Configuration Wizards**, click **RAID Configuration** to launch the wizard. The **View Current RAID Configuration** and **Select Controller** page is displayed along with the information on whether the displayed virtual disk is secure.
5. Select a security capable controller and click **Next**.
If the non-RAID disks are attached to the selected controller, select the non-RAID physical disk-drives, and then click **Next** to initialize them. Else, the **Select RAID Level** page is displayed.

 **NOTE:** During initialization, all the data on the non-RAID disk drives are deleted.

6. Select the RAID level and click **Next**.
The **Select Physical Disks** page is displayed.
 **NOTE:** Create boot virtual disks only from disk drives populated across slots 0–3 of the system. For slot information, see the system Owner's Manual.
7. From the **Encryption Capability** drop-down menu, select **Self-encryption**.
The self-encryption disks (SEDs) are displayed.
8. Select the SEDs and specify the properties, and then click **Next**.
The **Virtual Disk Attributes** page is displayed.
9. Select the virtual disk parameters, select the **Secure Virtual Disk** option, and click **Next**.
The **Summary** page is displayed.
10. To apply the RAID configuration, click **Finish**.


Related Links

- [Selecting a RAID controller](#)
- [Foreign configuration found](#)
- [Selecting RAID levels](#)
- [Selecting physical disks](#)
- [Setting virtual disk attributes](#)
- [Viewing summary](#)
- [Applying the local key on a RAID controller](#)

Key encryption

Use the **Key Encryption** feature to:

- Apply local encryption for PERC H710, H710P, H730, H730P, H810, and H830 RAID controllers.
- Delete the local encryption key.
- Encrypt the existing unsecure virtual drives.
- To change an existing encryption key to another one.


 **NOTE:** For more information about the key encryption feature, see the *Key Encryption in Lifecycle Controller* white paper at delltechcenter.com/lc.

Applying the local key on a RAID controller

Before applying the local key on a RAID controller, make sure that the controller is security-capable.


To apply the local key on a RAID controller:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Hardware Configuration**.
3. In the right pane, click **Configuration Wizards**.
4. Under **Storage Configuration wizards**, click **Key Encryption**.
5. Select the controller to apply a local key and click **Next**.
6. Click **Set up local key encryption** and click **Next**.

 **NOTE:** Some controller options are disabled if they do not support encryption.

7. Enter the **Encryption Key Identifier** that is associated with the entered passphrase.
The **Encryption Key Identifier** is a passphrase hint; you must enter the passphrase when Lifecycle Controller prompts this hint.


8. In the **New Passphrase** field, enter a passphrase.

 **NOTE:** The controller uses the passphrase to encrypt the disk drive data. A valid passphrase contains 8–32 characters. It must include a combination of uppercase and lowercase letters, numbers, and symbols without spaces.


9. In the **Confirm Passphrase** field, re-enter the passphrase, and then click **Finish**.

Local key encryption mode

You can perform the following tasks while the controller is in the Local Key Encryption mode:

 **NOTE:** For more information on the specification and configuration-related information for the PERC H710, H710P, H810, and PERC 9 controllers, see the *PERC H710, H710P, and H810 Technical Guidebooks*.

- Encrypt unsecure virtual disks — Enable data encryption on all the security-capable, unsecure virtual drives.

 **NOTE:** This option is available if there are secure-capable virtual disks connected to a security-capable controller.

- Rekey controller and encrypted disks with a new key — Replace the existing local key with a new key.

- Remove encryption and delete data — Delete the encryption key on the controller and all the secure virtual drives along with its data. After deletion, controller state changes to **No encryption** mode.

Related Links


- [Encrypting unsecure virtual disks](#)
- [Rekey controller with new local key](#)
- [Removing encryption and deleting data](#)

Encrypting unsecure virtual disks


Make sure that the following prerequisites are met:

- Selected controller is security-capable.
- Security-capable virtual drives must be attached to the controller.
- Controller must be in the local-key-encryption mode.

To encrypt the unsecure virtual drives:

 **NOTE:** All virtual drives created on the same physical disk-drives are automatically encrypted when any one of the virtual drives is encrypted.

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Hardware Configuration**.
3. In the right pane, click **Configuration Wizards**.
4. On the **Storage Configuration wizards** page, click **Key Encryption**.
5. Select the controller that is encrypted and click **Next**.

 **NOTE:** The encryption mode (**Local Key Encryption**) applied to the selected controller does not change.

6. Select **Encrypt unsecure virtual disks** and click **Next**.
7. To enable encryption, select unsecure virtual drives and click **Finish**.

Related Links

- [Local key encryption mode](#)

Rekey controller with new local key

To rekey the controller with a new local key:


1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Hardware Configuration**.
3. In the right pane, click **Configuration Wizards**.
4. On the **Storage Configuration wizards** page, click **Key Encryption**.
5. On the Select Controller Select the controller to which the local key is applied and click **Next**.
6. In the **Existing Passphrase** field, enter the existing passphrase associated with the displayed Encryption Key Identifier.
7. In the **New Encryption Key Identifier** field, enter the new identifier. The **Encryption Key Identifier** is a passphrase hint; you must enter the passphrase when Lifecycle Controller prompts this hint.
8. In the **New Passphrase** field, enter the passphrase that is associated with the new encryption key identifier.

Related Links

- [Local key encryption mode](#)

Removing encryption and deleting data

To remove the encryption and delete the data on the virtual disks:

 **CAUTION: The existing encryption, virtual drives, and all the data are permanently deleted.**

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Hardware Configuration**.
3. In the right pane, click **Configuration Wizards** and click **Key Encryption**.
4. Select the controller on which you must remove the key that was applied and click **Next**.
5. In the right pane, select **Remove encryption and delete data** and click **Next**.
6. Select **Delete encryption key and all secure virtual disks** and click **Finish**.


Related Links


[Local key encryption mode](#)

Breaking mirrored drives

To split the mirrored array of RAID-1 virtual drives:

1. Start Lifecycle Controller.
2. In the left pane, click **Hardware Configuration**.
3. In the right pane, click **Configuration Wizards**.
4. Under **Storage Configuration wizards**, click **Break Mirror**.
The **Break Mirror** page is displayed with the mirrored virtual drives.
5. Select the related controller and click **Finish**.

 **NOTE:** The **Break Mirror** feature does not support software RAID controllers.

 **NOTE:** For more information about the break mirror feature, see the *Performing a Break-Mirror Operation Using Lifecycle Controller* white paper at delltechcenter.com/lc.


The system automatically turns off even if one mirrored array is successfully delinked.

System setup — Advanced Hardware Configuration


The Lifecycle Controller **Advanced Hardware Configuration** wizards allow you to configure BIOS, iDRAC, and certain devices such as NIC, and RAID controllers through Human Interface Infrastructure (HII). HII is a UEFI-standard method for viewing and setting a device's configuration. You can utilize a single utility to configure multiple devices that may have different preboot configuration utilities. The utilities also provide localized versions of devices such as the BIOS setup.

Based on the system configuration, other device types may also appear under **Advanced Hardware Configuration** if they support the HII configuration standard.

The **Advanced Hardware Configuration** wizard allows you to configure the following:

 **NOTE:** You can also use **System Setup** utility during startup to configure the following devices. For more information about the **System Setup** utility, see [Using The System Setup Program And Boot Manager](#).

- System BIOS Settings
- iDRAC Device Settings
- NICs

 **NOTE:** You can configure only one NIC at a time.

- Broadcom 57810S DP 10G SFP+ Adapter (Full Height)
- Broadcom 57810S DP 10G SFP+ Adapter (Low Profile)
- Broadcom 57800S DP 10G BASE-T Adapter (Full Height)
- Broadcom 57800S DP 10G BASE-T Adapter (Low Profile)
- Broadcom 5720 DP 1G Adapter (Full Height)
- Broadcom 5720 DP 1G Adapter (Low Profile)
- Broadcom 5719 QP 1G Adapter (Full Height)
- Broadcom 5719 QP 1G Adapter (Low Profile)
- Broadcom 57800S QP rNDC (10G BASE-T + 1G BASE-T)
- Broadcom 57800S QP rNDC (10G SFP+ + 1G BASE-T)
- Broadcom 5720 QP rNDC 1G BASE-T
- Broadcom 57810S DP bNDC KR
- Broadcom 5719 QP 1G Mezz
- Broadcom 57810S DP 10G KR Mezz
- Intel i540 DP 10G BASE-T Adapter (Full Height)
- Intel i540 DP 10G BASE-T Adapter (Low Profile)
- Intel DP 10GBASE SFP+ (Full Height)
- Intel DP 10GBASE SFP+ (Low Profile)
- Intel i350 DP 1G Adapter (Full Height)
- Intel i350 DP 1G Adapter (Low Profile)
- Intel i350 QP 1G Adapter (Full Height)
- Intel i350 QP 1G Adapter (Low Profile)
- Intel i540 QP rNDC (10G BASE-T + 1G BASE-T)
- Intel i350 QP rNDC 1G BASE-T
- Intel i520 DP bNDC KR
- Intel DP 10Gb KR Mezz
- Intel DP 10Gb KR Mezz
- Intel I350 QP 1G Mezz
- ConnectX-3 Dual Port 10 GbE KR Blade Mezzanine Card
- ConnectX-3 Dual Port 10 GbE DA/SFP+ Network Adapter
- ConnectX-3 Dual Port 40 GbE QSFP+ Network Adapter
- Fibre Channel cards:
 - * QLogic QLE2660 Single Port FC16 HBA

- * QLogic QLE2660 Single Port FC16 HBA (LP)
- * QLogic QLE2662 Dual Port FC16 HBA
- * QLogic QLE2662 Dual Port FC16 HBA (LP)
- * QLogic QME2662 Dual Port FC16 HBA Mezzanine
- * QLogic QLE2560 FC8 Single Channel HBA
- * QLogic QLE2562 FC8 Dual Channel HBA
- * QLogic FC8 Embedded Mezz Card QME2572
- * Emulex LPe16000 Single Port FC16 HBA
- * Emulex LPe16000 Single Port FC16 HBA (LP)
- * Emulex LPe16002 Dual Port FC16 HBA
- * Emulex LPe16002 Dual Port FC16 HBA (LP)
- * Emulex LPm16002 Dual Port FC16 HBA Mezzanine

RAID

- H310 Adapter
- H310 Mini Monolithic
- H310 Mini Blades
- H310 Embedded
- H330 Adapter
- H330 Mini Monolithic
- H330 Mini Blades
- H330 Embedded
- H710 Adapter
- H710 Mini Blades
- H710 Mini Monolithic
- H710P Adapter
- H710P Mini Blades
- H710P Mini Monolithic
- H810 Adapter
- H830 Adapter
- H730P PERC9 Adapter
- PCIe Adapter
- PCIe Backplane

Integrated Broadcom NICs are controlled by both BIOS and the settings stored on the device itself. As a result, the **Boot Protocol** field in the HII of integrated NICs has no effect; this setting is instead controlled by the BIOS on the **Integrated Devices** screen.


To set integrated NICs to an iSCSI or PXE boot mode, select **System BIOS Settings**, and then select **Integrated Devices**. In the list for each embedded NIC, select the appropriate value:

- **Enabled** for no boot capability.
- **Enabled with PXE** to use the NIC for PXE boot.

- **Enabled with iSCSI** to use the NIC to boot from an iSCSI target.

Modifying device settings

To modify device settings using the **Advanced Hardware Configuration**:

 **NOTE:** You can also modify the device settings by using the **System Setup** utility during startup. For more information about the **System Setup** utility, see [Using The System Setup Program And Boot Manager](#).

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, select **System Setup**.
3. In the right pane, click **Advanced Hardware Configuration**.
4. Select the device you want to configure.

Based on the configuration setting changes, the following message may be displayed:

```
One or more of the settings requires a reboot to be saved and activated. Do you want to reboot now?
```

5. Select **No** to continue making additional configuration changes or select **Yes** to save the changes and exit the wizard.

All changes are applied during the next system restart.

Collect system inventory on restart

When you enable the **Collect System Inventory On Restart** (CSIOR) property, hardware inventory and part configuration information is discovered and compared with previous system inventory information on every system restart.

Updating server inventory information

To enable collecting system inventory on restart:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Hardware Configuration**.
3. In the right pane, select **Hardware Inventory**.
4. Click **Collect System Inventory on Restart**.
5. Under **Collect System Inventory on Restart**, click **Enabled**, and then click **Finish**.

The system inventory is updated after the next restart.

Configuring local FTP server

If your organization's users are on a private network that does not have access to external sites, specifically **ftp.dell.com**, you can provide firmware updates from a locally-configured FTP server. The users in your organization can access updates or drivers for their Dell server from the local FTP server instead of **ftp.dell.com**. A local FTP server is not required for users, who have access to **ftp.dell.com** through a proxy server. Check **ftp.dell.com** frequently to make sure your local FTP server has the most recent updates.

FTP authentication

Although you must provide the user name and password for the FTP server, Lifecycle Controller supports anonymous login to the FTP server using the FTP server address to download the catalog information. If you use a firewall, you should configure it to allow outgoing FTP traffic on port 21. The firewall must be configured to accept incoming FTP response traffic.


Requirements for a local FTP server

The following requirements apply when configuring a local FTP server.

- The local FTP server must use the default port (21).
- You must use the **Settings** wizard to configure the network card on your system before accessing updates from the local FTP server.


Copying repository to a local FTP server from the Dell Server Updates DVD

To copy the repository:

1. Download the *Dell Server Updates* ISO image to your system from **dell.com/support**.
 **NOTE:** For updating the OS driver packs, use the *Dell Lifecycle Controller OS Driver Packs* DVD.
2. Copy the repository folder of the DVD to the root directory of the local FTP server.
3. Use this local FTP server for firmware update.

Using Dell Repository Manager to create the repository and copy it to a local FTP server

To create and copy the repository:

1. Copy the repository created using the **Dell Repository Manager** to the root directory of the local FTP server.
 **NOTE:** For information about creating a repository for your system, see the *Dell Repository Manager User's Guide* at **dell.com/support/home**.
2. Use this local FTP server for firmware update.

Accessing updates on a local FTP server

You must know the IP address of the local FTP server to specify the online repository when using the **OS Deployment** and **Firmware Update** features.

If you are accessing the local FTP server through a proxy server, you require the following information about the proxy server:


- The host name or IP address of the proxy server
- The port number of the proxy server
- The user name to access the proxy server
- The password to access the proxy server
- The type of proxy server
- To download drivers using a proxy server to access an FTP server, you must specify:

- **Address** — The IP address of the local FTP server or **ftp.dell.com**
- **User Name** — The user name to access the FTP location.
- **Password** — The password to access this FTP location.
- **Proxy Server** — The server host name or the IP address of the proxy server.
- **Proxy Port** — The port number of the proxy server.
- **Proxy Type** — The type of proxy server. HTTP and SOCKS 4 proxy server types are supported by Lifecycle Controller.
- **Proxy User Name** — The user name required to access the proxy server.
- **Proxy Password** — The password required to access the proxy server.


Configuring a local USB drive

If you are using a private network that does not have access to external sites such as **ftp.dell.com**, you can provide updates from a locally-configured USB drive.

The USB drive used as a repository must have at least 8 GB free space.

 **NOTE:** A USB drive is not required for users, who have access to **ftp.dell.com** through a proxy server.

For the latest updates, download the most recent *Dell Server Updates* ISO images for your system from **dell.com/support**.

 **NOTE:** Lifecycle Controller supports internal SATA optical drives, USB drives, and Virtual Media devices. If the installation media is corrupt or not readable, then Lifecycle Controller may be unable to detect the presence of a media. In this case, an error message is displayed stating that no media is available.

Copying repository to a local USB drive from the Dell Server Updates DVD

To copy a repository:

1. Download the latest *Dell Server Updates* ISO image file from **dell.com/support**.
2. Copy the repository folder of the DVD to the root directory of the USB drive.
3. Use this USB drive for firmware update.

Using Dell Repository Manager to create the repository and copy to a USB drive

To create and copy the repository:

1. Copy the repository created using the **Dell Repository Manager** to the root directory of the USB drive.
2. Use this USB drive for firmware update.

 **NOTE:** For information on creating a repository for your system, see the *Dell Repository Manager User's Guide* at **dell.com/support/home**.


Maintain

Using Lifecycle Controller, you can maintain the health of a system throughout its life cycle using the features such as **Part Replacement Configuration** and **Platform Restore**.

Platform restore

Lifecycle Controller allows you to create a copy (image file) of the server's profile on the vFlash SD card installed on the server. The server profile backed up on a vFlash SD card contains the server component configuration and firmware installed on various components on the server where the card is installed. The backup image file does not contain any operating system or hard-disk drive data. For more information about the supported components, see [Supported Components](#). For better security, Lifecycle Controller allows you to remove the vFlash SD card and keep it in a safe location, or you can copy the server profile (backup image) that is stored on the vFlash SD card to any USB drive or an external network share. Therefore, whenever the firmware is corrupted, configuration changes are incorrect, or the system board is replaced, you can use the backup image to restore the server to its previously stored profile. The following features are available to maintain a server:

- **Backup Server Profile** — Allows you to create the server profile on a vFlash SD card that is installed on the server. Lifecycle Controller can create the server profile only on the vFlash SD card.
- **Export Server Profile** — Allows you to export the server profile that is stored on the vFlash SD card to a USB drive or a network share (CIFS or NFS).
- **Import Server Profile** — Allows you to restore the backup image from the vFlash SD card, USB drive, or a network share (CIFS or NFS).
- **Import Server License** — Allows you to import an iDRAC license from a network share or a USB drive.

 **NOTE:** This feature is licensed. You must acquire the required license to enable this feature. For more information about acquiring and using the licenses, see the *iDRAC User's Guide* at dell.com/support/home.

About server profile backup image

The server profile backup image file contains:

- Readable
 - System identification information such as model number and Service Tag. For example, R720 and 1P3HRBS.
 - Date and time the backup was last taken.
 - Currently installed hardware inventory information.
 - Firmware for each component.
- Encrypted
 - Component configuration information.

- User name and password for RAID controller and BIOS.
- Component certificates.
- Licenses.
- Signature to validate that the backup file is not tampered and generated by Lifecycle Controller.

The server profile backup image file does not contain:

- Operating system or any data stored on hard-disk drives or virtual drives.
- vFlash SD card partition information.
- Lifecycle log.
- Dell diagnostics.
- Dell OS Driver Pack.
- A Local Key Management (LKM) passphrase, if the LKM-based storage encryption is enabled. However, you must provide the LKM passphrase after performing the restore operation.

Security

The contents of the backup image file cannot be accessed with any application, even if it is generated without a passphrase. However, if the backup image file is created using a passphrase, Lifecycle Controller uses the passphrase to encrypt the backup image file with 128-bit encryption.

Size

Based on the server configuration, the size of a backup image file can be a maximum of 384 MB.

Performance

- Back up — The time taken to collect the required information and store the backup image file on a vFlash SD card is 45 minutes (maximum).
- Restore — The time taken to restore a server using a backup image file depends on the number of components installed on the server. Most of the server components such as BIOS, NIC, RAID, and other host bus adapters require multiple system restarts in order to restore the server to its previous configuration. Each restart may take 1–15 minutes (for maximum system hardware configurations). This restart time is in addition to the time taken for accessing the backup image file, which depends on where it is stored (vFlash SD card, USB drive, or network share).

Supported components

The following table lists the server components that are supported by Lifecycle Controller while performing a backup or restore operation.

Table 7. Supported Components

Component	Firmware	Configuration	Security Information*
BIOS	Yes	Yes	Yes
RAID Controller	Yes	Yes	NA
NIC	Yes	Yes	NA
iDRAC	Yes	Yes	Yes
OS Driver Pack	NA	NA	NA
Dell Diagnostics	NA	NA	NA

Component	Firmware	Configuration	Security Information*
Lifecycle Controller	Yes	NA	NA
Backplane	NA	NA	NA
CPLD	NA	NA	NA
Power Supply Unit	Yes	NA	NA
FC HBA	Yes	Yes	NA
Enclosure	NA	NA	NA
PCIe SSD	Yes	NA	NA

* The security information refers to the user credentials that are used to access the components.

Backup server profile

Use this licensed feature to perform the following and store the backup image files in a vFlash SD card:

- Back up the following:
 - Hardware and firmware inventory such as BIOS, NDCs, Lifecycle Controller supported add-in NIC cards, and Storage Controllers (RAID level, virtual disk, and controller attributes)
 - System information
 - Lifecycle Controller firmware images, data and configuration, and iDRAC firmware and configuration
- Optionally, secure the backup image file with a passphrase.

Related Links

- [System or feature behavior during backup](#)
- [Backing up the server profile](#)

Backing up the server profile

Before you back up the server profile, make sure that the following prerequisites are met:

- A software license for Dell PowerEdge servers is installed on the server. For more information about managing licenses using the iDRAC web interface, go to **Overview** → **Server** → **Licenses**, and see the *iDRAC Online Help*.
- The server has a valid Service Tag (seven characters).
- vFlash SD card is installed, initialized, and enabled.
- vFlash SD card has a minimum free space of 384 MB.

To back up the server profile:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, select **Platform Restore**.
3. In the right pane, select **Backup Server Profile**.
4. To generate the backup file without entering the passphrase, click **Finish**.

Alternatively, to generate an encrypted backup file using a passphrase, enter the passphrase and click **Finish**. In the absence of a passphrase, Lifecycle Controller encrypts the backup image file with a default passphrase (internally generated).

5. In the **Backup File Passphrase** field, enter a passphrase. For example, **Rt@#12tv**.



NOTE: A valid passphrase contains 8–32 characters. It must include a combination of uppercase and lowercase letters, numbers, symbols, and must not have white spaces. The passphrase is optional and if used for backup, it must be used during restore.

6. In the **Confirm Passphrase** field, re-enter the passphrase and click **Finish**.

The system restarts and Lifecycle Controller is disabled. You cannot access Lifecycle Controller until the backup process is complete. A success message is displayed when you start Lifecycle Controller after backup is complete.



NOTE: You can check the Lifecycle logs in the iDRAC web interface for backup server profile status. To view the log in Lifecycle Controller after the backup is completed, click **Lifecycle Log** → **View Lifecycle Log History**.

System or feature behavior during backup

- Lifecycle Controller is disabled.
- A partition with a label name SRVCNF is automatically created on the vFlash SD card to store the backup image file. If a partition with the label name SRVCNF exists, it is overwritten.
- Takes up to 45 minutes depending on the server configuration.
- Takes a backup of all configuration information.
- Does not back up diagnostics and driver pack information.
- Backup fails if an AC power cycle is performed.

Export server profile

Use this licensed feature to export the backup image file stored in the vFlash SD card to a USB drive or a network share.

Related Links

[System or feature behavior during export](#)

[Exporting server profile to a USB drive or network share](#)

Exporting server profile to a USB drive or network share

Before exporting the server profile, make sure that the following prerequisites are met:

- A software license for Dell PowerEdge servers is installed on the server. For more information about managing licenses using the iDRAC web interface, go to **Overview** → **Server** → **Licenses**, and see *iDRAC Online Help*.
- vFlash SD card is installed in the system and must contain the backup image file.
- USB drive has a minimum free space of 384 MB.
- Network share is accessible and has a minimum free space of 384 MB.
- Use the same vFlash SD card that was used during backup.

To export the server profile to a USB drive or a network share:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, select **Platform Restore**.
3. In the right pane, select **Export Server Profile**.
4. Select either **USB Drive** or **Network Share**, enter the details, and then click **Finish**.



NOTE: You can also use a USB drive that is attached to the client system while operating remotely. To use the USB drive remotely, use the **Virtual Media** feature. For more information, see the *iDRAC User's Guide* at dell.com/support/home.

The *Backup_<service_tag>_<time_stamp>.img* file is exported to the specified location.

Related Links

[Exporting hardware inventory to a USB drive](#)

[Exporting hardware inventory to a network share](#)

System or feature behavior during export

- Exporting the server profile may take up to five minutes based on the server configuration.
- Lifecycle Controller exports the backup image file in the *Backup_<service_tag>_<time_stamp>.img* format. The <service_tag> is copied from the backup image file name. The <time_stamp> is the time when the backup was initiated.
- After a successful export, the event is logged in the Lifecycle Log.

Import server profile

Use the **Import Server Profile** feature to apply a backup to the system from which it was taken previously, and restore the system hardware and firmware configuration according to the information stored in the backup image file. For more information about the supported components, see [Supported Components](#). The operation restores the backup information to all the system components that are located in the same physical location (for example, in the same slot) when the backup was performed. If you install components such as a RAID controller, NIC, CNA, FC HBA, and hard-disk drive in a slot that is different from the slot they were installed before backup, the restore operation fails on such components. The failures are logged in the Lifecycle Log.

You can cancel a restore job using the **iDRAC Settings** utility by pressing <F2> during POST, and then clicking **Yes** under **Cancel Lifecycle Controller Actions** or resetting iDRAC. This operation initiates the recovery process and restores the system to a previously known state. The recovery process may take more than five minutes based on system configuration. To check if the recovery process is complete, view the Lifecycle logs in the iDRAC web interface.

Related Links

[Importing server profile from a vFlash SD card, network share, or USB drive](#)

[Importing server profile after system board replacement](#)

[Importing server profile using a vFlash SD card](#)

[Importing server profile from a network share](#)

[Importing server profile from a USB drive](#)

Importing server profile from a vFlash SD card, network share, or USB drive

Before importing the server profile, make sure that the following prerequisites are met:

- The Service Tag of the server is same as when the backup was taken.
- If you are restoring from a vFlash SD card, the vFlash SD card must be installed and must contain the backup image in a folder labeled **SRVCNF**. This image must be from the same server that you are trying to restore.
- If you are restoring from a network share, make sure that the network share where the backup image file is stored is accessible.

You can import the server profile from a vFlash SD card, Network Share, or a USB drive.

Related Links

- [System or feature behavior during import](#)
- [Importing server profile using a vFlash SD card](#)
- [Importing server profile from a network share](#)
- [Importing server profile from a USB drive](#)
- [Post-import scenario](#)
- [Import server profile](#)

Importing server profile using a vFlash SD card

To import from a vFlash SD card:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, select **Platform Restore**.
3. In the right pane, select **Import Server Profile**.
4. Select **vFlash Secure Digital (SD) Card** and click **Next**.
5. Select either **Preserve** or **Delete**.
 - **Preserve** — Preserves the RAID level, virtual drive, and controller attributes.
 - **Delete** — Deletes the RAID level, virtual drive, and controller attributes.
6. If you have secured the backup image file with a passphrase, enter the passphrase (entered during backup) in the **Backup File Passphrase** field, and then click **Finish**.

Related Links

- [System or feature behavior during import](#)
- [Import server profile](#)
- [Importing server profile after system board replacement](#)

Importing server profile from a network share

To import from a network share:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, select **Platform Restore**.
3. In the right pane, select **Import Server Profile**.
4. Click **Local Drive (USB) or Network Share** and click **Next**.
5. Click **Network Share**.
6. Select **CIFS** or **NFS**, enter the backup file name along with the directory, subdirectory path, and then click **Next**.
7. Select either **Preserve** or **Delete**.
 - **Preserve configuration** — Preserves the RAID level, virtual disk, and controller attributes.
 - **Delete configuration** — Deletes the RAID level, virtual disk, and controller attributes.

8. If you have secured the backup image file with a passphrase, enter the passphrase (entered during backup) in the **Backup File Passphrase** field, and then click **Finish**.

Related Links

- [System or feature behavior during import](#)
- [Import server profile](#)
- [Importing server profile after system board replacement](#)

Importing server profile from a USB drive

To import from a USB drive:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, select **Platform Restore**.
3. In the right pane, select **Import Server Profile**.
4. Select **Local Drive (USB) or Network Share** and click **Next**.
5. Select **USB Drive**.
6. From the **Select Device** drop-down menu, select the attached USB drive.
7. In the **File Path** field, enter the directory or subdirectory path, where the backup image file is stored on the selected device and click **Next**.
8. Select either **Preserve** or **Delete**.
 - **Preserve** — Preserves the RAID level, virtual disk, and controller attributes.
 - **Delete** — Deletes the RAID level, virtual disk, and controller attributes.
9. If you have secured the backup image file with a passphrase, enter the passphrase (entered during backup) in the **Backup File Passphrase** field, and then click **Finish**.

Related Links

- [System or feature behavior during import](#)
- [Import server profile](#)
- [Importing server profile after system board replacement](#)

System or feature behavior during import

- Lifecycle Controller is not available during restore, and is enabled after the import operation is complete.
- Restores everything that was backed up, including Lifecycle Controller content.
- Import may take up to 45 minutes depending on the server configuration.
- Diagnostics or driver pack information is not restored.
- If multiple restarts occur during tasks executed in Lifecycle Controller, it is because there was an issue while trying to set the device configuration, which attempts to perform the task again. Check the Lifecycle Logs for information on the failed device.
- Import operation for a card fails if the slot in which it was installed earlier has changed.
- The import operation restores only Perpetual license. The Evaluation license is not restored only if it has not expired.

Post-import scenario

The managed-system performs the following operations:

1. The system if turned on, automatically turns off. If the system boots to an operating system, it attempts to perform a graceful shutdown. If it is not able to perform a graceful shutdown, it performs a forced shutdown after 15 minutes.

2. System turns on and boots to System Services to execute tasks to perform firmware restore for supported devices (BIOS, storage controllers, and Add-in NIC cards).
3. System reboots and goes to System Services to execute tasks for firmware validation, configuration restore for supported devices (BIOS, storage controllers, and Add-in NIC cards) and the final verification of all tasks executed.
4. System turns off and performs iDRAC configuration and firmware restore. After completion, iDRAC resets and takes up to 10 minutes before the system turns on.
5. System turns on and the restore process is complete. Check the Lifecycle Logs for the restore process entries.

Related Links

[Importing server profile from a vFlash SD card, network share, or USB drive](#)


Importing server profile after system board replacement

Before importing the server profile after replacing the system board, make sure that the following prerequisites are met:

- A backup image of the server with the old system board is present.
- If you are restoring from a vFlash SD card, it must be installed, and contain the backup image in a folder labeled SRVCNF. This image must be from the same server that you are trying to restore.
- If you are restoring from a network share, make sure that the network share where the backup image file is stored is accessible.

After replacing the system board, import the server profile from a vFlash SD card, network share, or a USB device.

- See [Post-Import Scenario](#).
- The Service Tag is restored on the new system board from the backup file.

 **NOTE:** Lifecycle Controller prompts you with a dialog box to retrieve the Service Tag and restore the server profile, if you have replaced a system board and have not entered the Service Tag on the replaced system board.

Related Links

[Import server profile](#)

[Importing server profile using a vFlash SD card](#)

[Importing server profile from a network share](#)


[Importing server profile from a USB drive](#)

Restoring a server profile after system board replacement

When you launch Lifecycle Controller after replacing the system board, a message is displayed prompting you to either retrieve the Service Tag and the server profile from a vFlash SD card that contains the backed-up server profile or manually enter the Service Tag in case you have not backed up the server.

To restore the server profile:

1. Press <F10> during POST to launch Lifecycle Controller.
2. Click **Yes** on the *Do you want to restore the service tag?* dialog box.
3. On the **Restore Service Tag** dialog box:
 - To import a server profile that is stored on a vFlash SD card, click **Import Server Profile**. For more information about importing a server profile, see [Import Server Profile](#).


 **NOTE:** To import a server profile, you must have an Enterprise license and administrator-level rights.

- To manually enter a Service Tag, click **Manually configure service tag**. On the **Service Tag Settings** page, type the Service Tag, and then click **OK**.

Import server license

Use the **Import Server License** feature to import an iDRAC license from the Lifecycle Controller GUI. The scenarios in which you may want to import a license are when you set up a new server shipped from the factory, while upgrading an Express license to an Enterprise license, and so on. You can import the license that is stored on a USB drive or on the network share such as CIFS or NFS. You can perform the following operations only if you have an evaluation license of Lifecycle Controller:

- Back up a server profile
- Export a server profile
- Configure a vFlash SD card

 **NOTE:** You can import license on PowerEdge 12th generation and later servers. For more information about importing server license, see the *Importing iDRAC License Using Lifecycle Controller* white paper at delltechcenter.com/lc.

Importing server license from a network share or USB drive

Before importing a server license, make sure that the following prerequisites are met:

- The number of licenses already installed on the server must not be more than 16.
- The license being imported is not expired.
- The license being imported is not of perpetual type, which has a unique identifier or Service Tag associated with another server.
- The license being imported is a proper compressed file and not corrupted file.
- The license being imported must not be already installed on the same server.
- If importing a leased license, that date of import must be a date after the lease date is activated.

Importing an iDRAC license from a network share

To import a server license from a network share:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Platform Restore**.
3. In the right pane, click **Import Server License**.
4. On the **Import Server License** page, click **Network Share**.
5. Click **Yes**, if the following message appears: `Network is not configured. Do you want to configure now?`

For more information about setting up a network connection, see [Configuring Network Settings NIC Card](#). You can test the connection of a network by clicking **Test Network Connection**.

6. If the network is configured, click **CIFS** or **NFS**, select or type the appropriate data in the field, and then click **Next**.

The license is imported, installed, and the following message is displayed:

```
License successfully Imported.
```

Importing an iDRAC license from a USB drive

To import a server license from a USB drive:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Platform Restore**.
3. In the right pane, click **Import Server License**.
4. On the **Import Server License** page, click **USB Drive**.



NOTE: If a USB Drive is not connected, the following message is displayed:

Insert Media

5. From the **Select Device** drop-down menu, select the attached USB drive.
6. In the **File Path** field, enter the directory or subdirectory path, where the backup image file is stored on the selected device and click **Finish**.

The license is imported, installed, and the following message is displayed:

License successfully Imported.

Part replacement configuration


Use the **Part Replacement** feature to automatically update a new part to the firmware version or the configuration of the replaced part, or both. The update occurs automatically when you reboot your system after replacing the part. It is activated through a license, and can be disabled remotely using Lifecycle Controller-Remote Services, or through the Lifecycle Controller.



NOTE: The **Part Replacement** feature is licensed. Acquire the license to enable the feature. For more information on acquiring and using the licenses, see *iDRAC User's Guide* at dell.com/support/home.

Applying firmware and configuration updates to replaced parts



Before configuring replaced parts, make sure that the following prerequisites are met:

- Click the **Collect System Inventory On Restart** option, so that Lifecycle Controller automatically invokes **Part Firmware Update** and **Part Configuration Update** when the system is started.
 -  **NOTE:** If **Collect System Inventory On Restart** is disabled, the cache of system inventory information may become stale if new components are added without manually entering Lifecycle Controller after turning the system on. In manual mode, press **<F10>** after the part replacement during a system restart.
- Make sure that the **Disabled** option under **Part Firmware Update** and **Part Configuration Update** are cleared.
- The replaced card or part must belong to the same family as the previous component.
- If the current adapter on the system is NPAR enabled and is replaced with a new adapter, after the host server is turned on, press **<F2>** and select **System Setup** → **Device Settings** and make sure that the **NPAR** is enabled. NPAR must be enabled on the new adapter before using the **Part Replacement** feature.

To apply part firmware and configuration to replaced parts:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Platform Restore**.
3. In the right pane, click **Part Replacement**.

The **Part Replacement Configuration** page is displayed.

4. From the part firmware update drop-down menu, select one of the following:
 - **Disabled** — Firmware update on replaced parts is not performed.
 - **Allow version upgrade only** — Firmware update on replaced parts is performed only if the firmware version of the new part is earlier than the existing part.
 - **Match firmware of replaced part** — Firmware on the new part is updated to the version of the original part.
 -  **NOTE: Match firmware of replaced part** is the default setting.
5. From the part configuration update drop-down menu, select one of the following:
 - **Disabled** — The feature is disabled and the current configuration is not applied if a part is replaced.
 - **Apply always** — The feature is enabled and the current configuration is applied if a part is replaced.
 -  **NOTE: Apply always** is the default setting.
 - **Apply only if firmware match** — The feature is enabled and the current configuration is applied only if the current firmware matches with the firmware of a replaced part.


Supported devices

You can update the part firmware and configuration for the following devices:

- NICs
- PERC and SAS series 7 and 8 and Fibre Channel cards
- Power Supply Unit (PSU)

Repurpose or retire system

On the 13th generation of PowerEdge servers, you can erase the system information using the Lifecycle Controller **Repurpose or Retire System** option. This feature permanently deletes server and storage-related data on selected components of a server before you repurpose or retire a server. The selected components are then returned to their default state.

 **NOTE:** The **Repurpose or Retire System** option resets the state of the inventory collection to **Enabled**, and then permanently deletes the iDRAC and BIOS configuration information, factory-shipped inventory, configurations, Lifecycle Log information (historical data and work notes), backup image file, non-volatile (NV) cache, vFlash card, operating system driver packs, and diagnostics. The hardware and software inventory data related to the system are deleted during this operation, however, they are recreated during the next restart of the server.

 **NOTE:**

- The **Repurpose or Retire System** feature does not allow deletion of iDRAC-related license information.
- PERC NV cache and vFlash card are displayed only if PERC and vFlash cards are available on the server.

Use this feature to delete any sensitive data and configuration-related information when you need to:

- Retire a managed system.

- Reuse a managed system for a different application.

Deleting server information

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Hardware Configuration**, and then click **Repurpose or Retire System**.
3. On the **Select Components** page, select the features and components to delete from **Server Features** and **Storage Components**.
4. Click **Next**.
A summary of the features and components selected for deletion is displayed.
5. Read the information on the **Summary** page and click **Finish**.

Hardware diagnostics

It is recommended that you run diagnostics using the **Hardware Diagnostics utility**, as part of a regular maintenance plan to validate whether or not the system and the attached hardware are functioning properly. As the diagnostics utility has a physical (as opposed to logical) view of the attached hardware, it can identify hardware problems that the operating system and other online tools cannot identify. You can use the hardware diagnostics utility to validate the memory, I/O devices, CPU, physical disk drives, and other peripherals.

Performing hardware diagnostics

To perform hardware diagnostics:

1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane of Lifecycle Controller, click **Hardware Diagnostics**.
3. In the right pane, click **Run Hardware Diagnostics**.
The diagnostics utility is launched.
4. Follow the instructions on the screen.
When the tests are complete, results of the diagnostics tests are displayed on the screen. To resolve the problems reported in the test results, search dell.com/support.



NOTE: To close the **Hardware Diagnostics** page, restart the system, and press <F10> during POST to start Lifecycle Controller.


Technical Support Report (TSR)

If you have to work with technical support on an issue with a server but the security policies restrict direct Internet connection, you can provide technical support with necessary data to facilitate successful troubleshooting of the problem without having to install any software or download tools from Dell and without having access to the Internet from the server operating system or Lifecycle Controller. You can send the report from an alternate system and make sure that the data collected from your server is not viewable by nonauthorized individuals while sending it to technical support.

You can generate a health report of the server and using Lifecycle Controller, you can export the report to a location on the management station (local) or to a shared network location such as Common Internet File System (CIFS) or Network File Share (NFS). You can then share this report directly with technical support.

Lifecycle Controller allows you to collect data from the following options:

- **Hardware**
- **Software controller logs**
- **OS and Software application data**

 **NOTE: OS and Software application data** is enabled only if this data is already collected and cached using the OS collector tool on iDRAC. Lifecycle Controller displays this option along with the time stamp of data collection. You can select this option to retrieve the cached data available on the server. For more information on collecting **OS and Software application data** using the OS collector tool in iDRAC, see the *iDRAC User's Guide* at dell.com/support/home.

TSR is exported in the standard ZIP format. The report contains information that is similar to the information available in the DSET report such as:

- Hardware and inventory for all components
- System, Lifecycle Controller, and component attributes
- BIOS boot order information
- Installed and available component firmware versions
- vFlash SD card partition information
- Fresh Air and component statistics (for applicable servers)
- Operating system and application information
- Active Lifecycle Controller logs (archived entries are not included)
- Component hardware logs
- Trace logs
- Storage controller logs

After Lifecycle Controller exports the TSR file, you can delete information that you do not want to share with technical support. Each time the data is collected, an event is recorded in the Lifecycle Controller Log. The event includes information such as the interface used, the date and time of export, and iDRAC user name.

Exporting the technical support report

Before exporting a report, make sure that:

- **Collect System Inventory On Reboot (CSIOR)** is enabled.
- You have login and server control rights.

To export a technical support report:


1. Start Lifecycle Controller. For more information, see [Starting Lifecycle Controller](#).
2. In the left pane, click **Hardware Diagnostics**, and then click **Export Tech Support Report**.
3. On the **Terms and Conditions** page, read the conditions and select the **I agree to allow Technical Support to use tech support report data** option.

4. Click **Next**.

Lifecycle Controller checks the availability of hardware, operating system and application data, and RAID controller logs, and then displays the options listed in step 5. If the operating system and application data, or RAID controller logs are unavailable, the relevant options are grayed out. The duration to collect the selected data is displayed next to the options listed in step 5.

5. On the **Select Report Data** page, select the options for which you want to create a technical support report:

- **Hardware** — Collects data pertaining to the server and component inventory, firmware installed on the server, configuration information, and hardware logs.
- **RAID Controller Logs** — Contains information about the storage logs.
- **Operating System and Application Data** — Contains information about the operating system and application. The OS and application data may contain sensitive and personal information. You can choose to exclude this data while collecting the information.

 **NOTE: OS and Software application data** is enabled only if this data is already collected and cached using the OS collector tool on iDRAC. Lifecycle Controller only retrieves the cached data. For more information on collecting **OS and Software application data** using the OS collector tool in iDRAC, see the *iDRAC User's Guide* at dell.com/support/home.

6. Click **Next**.

7. On the **Select Export Settings** page, type or select the required information and click **Next**.

For information about the fields on this page, see the *Online Help* by clicking **Help** in the upper-right corner of the Lifecycle Controller application.

8. On the **Summary** page, verify your selections and click **Finish**.

Troubleshooting and frequently asked questions

This section describes the error messages commonly generated by Lifecycle Controller and provides suggestions for resolving the issues. This section also lists the questions that are frequently asked by Lifecycle Controller users.

Error messages

Each error message that is generated from Lifecycle Controller has a Message ID, Message Description, and Recommended Response Action in a single dialog box. If you want to view the detailed description about a message, see the *Event Message Reference Guide* at dell.com/support/home.

Frequently asked questions


- 1. When Lifecycle Controller downloads updates where are the files stored?**

The files are stored in a volatile memory, on the main system board. This memory is not removable and is not accessible through the operating system.
- 2. Is a virtual media device or vFlash SD card required to store data for updates?**

No. The files are stored in memory on the main system board.
- 3. What is virtual media?**

Virtual media is remote media such as CDs, DVDs, and USB disk drives that a server identifies as local media.
- 4. What should I do if an update fails?**

If an update fails, Lifecycle Controller restarts, and then attempts all the pending updates that are selected. After the final restart, the system opens the Lifecycle Controller **Home** page. Launch **Firmware Update** again, select the updates that failed, and then click **Apply**.

 **NOTE:** If the iDRAC firmware update is interrupted, you may have to wait up to 30 minutes before attempting another iDRAC firmware update.
- 5. What is vFlash SD card?**

vFlash SD card is a formatted SD (Secure Digital) card that plugs into iDRAC Enterprise. vFlash SD card can be formatted and enabled through iDRAC to make it accessible as a USB drive for data storage. Virtual flash is a partition on vFlash SD card to which you can remotely write an ISO file. For more information, see the *Integrated Dell Remote Access Controller (iDRAC) User's Guide* at dell.com/support/home.
- 6. Can I add my own drivers to use for operating system installation?**

No, you cannot add your own drivers for operating system installation. For more information on updating the drivers that are used for operating system installation, see [Updating Platform](#).
- 7. Can I update the drivers used by an already-installed operating system through Lifecycle Controller?**

No, Lifecycle Controller only provides drivers that are required for operating system installation. To update the drivers used by an installed operating system, see your operating system's Help documentation.

8. **Can I add my own drivers and firmware for updating Lifecycle Controller to a local USB drive?**

No, only drivers and firmware downloaded from the *Dell Server Updates* DVD are supported. For more information, see [Configuring Local USB Drive](#).

9. **Can I delete Lifecycle Controller?**

No.

10. **Can I use a virtual media for the operating system media source during installation?**

Yes. For more information about iDRAC, see the *iDRAC User's Guide* at dell.com/support/home.

11. **Can I use a virtual USB drive to update the repository?**

Yes. For more information on using a virtual USB drive to update the repository, see the *iDRAC User's Guide* at dell.com/support/home.

12. **What is UEFI? With which version of UEFI does Lifecycle Controller comply?**

Unified Extensible Firmware Interface (UEFI) is a specification that defines a model for the interface between the operating systems and firmware on a server. The interface consists of data tables that contain platform-related information, along with boot and runtime calls available to the operating system and operating system loaders. This interface provides a standard environment for booting an operating system and running preboot applications. Lifecycle Controller complies with the UEFI version 2.3. For more information, go to uefi.org.

13. **Within Hardware Configuration, what is the difference between the Configuration Wizards and Advanced Configuration?**

Lifecycle Controller offers two methods to configure hardware: **Configuration Wizards** and **Advanced Configuration**.

Configuration Wizards guide you through a sequence of tasks to configure your system devices. The Configuration Wizards include iDRAC, RAID, System Date/Time, and Physical Security. For more information, see [Configuring System](#) and [Advanced Hardware Configuration](#).

Advanced Configuration allows you to configure Human Interface Infrastructure (HII) –enabled devices (for example, NICs and BIOS). For more information [Advanced Hardware Configuration](#).

14. **Does Lifecycle Controller support rollback of BIOS and firmware?**

Yes. For more information, see [Firmware Rollback](#).

15. **Which devices support system updates?**

Currently, Lifecycle Controller supports updates to the BIOS, iDRAC firmware, power supply firmware, and certain RAID and NIC controller firmware. For more information, see [Updating Firmware](#).

16. **What should I do if my system stops responding while using Lifecycle Controller?**

If your system stops responding while using Lifecycle Controller, a black screen with red text is displayed. To resolve this problem, try restarting your system and enabling Lifecycle Controller. If the issue persists, contact your service provider.

For more information about recovering Lifecycle Controller from the **Lifecycle Controller Update Required** mode, see the *Recovery from Lifecycle Controller Update Required* white paper available at delltechcenter.com/lc.

17. **How do I find out the currently installed version details of the Lifecycle Controller product?**

Click **About** on the top right corner of the Lifecycle Controller home page.

18. **What should I do if I have an issue with mouse cursor synchronization when I access Lifecycle Controller through the iDRAC Virtual Console?**

Make sure that the **Single Cursor** option under **Tools** menu is selected on the iDRAC Virtual Console client. For more information, see the *Integrated Dell Remote Access Controller (iDRAC) User's Guide* at dell.com/support/home.

19. **Why should the CSIOR be enabled?**

The Collect System Inventory On Restart (CSIOR) option must be enabled so that Lifecycle Controller can automatically collect the details of the hardware and software available on the system, update the database, and invoke part firmware update and hardware configuration at system startup.

20. **Why are some features not accessible in Lifecycle Controller?**

The features such as Lifecycle Log, Hardware Inventory (View and Export), Part Replacement, and vFlash SD card configuration depend on the latest iDRAC firmware. Make sure that the latest iDRAC firmware is installed.

Easy-to-use system component names

The following table lists the Fully Qualified Device Descriptor (FQDD) of the system components and the equivalent easy-to-use names.

Table 8. Easy-to-use Names of System Components

FQDD of System Component Name	Easy-to-use Name
RAID.Integrated.1-1	Integrated RAID Controller 1
RAID.Slot.1-1	RAID Controller in Slot 1
NIC.Mezzanine.1B-1	NIC in Mezzanine
NIC.Mezzanine.1C-1	
NIC.Mezzanine.1C-2	
NIC.Mezzanine.3C-2	
NonRAID.Integrated.1-1	Integrated Storage Controller 1
NonRAID.Slot.1-1	Storage Controller in Slot 1
NonRAID.Mezzanine.2C-1	Storage Controller in Mezzanine 1 (Fabric C)
NIC.Embedded.1	Embedded NIC 1
NIC.Embedded.2	Embedded NIC 2
NIC.Embedded.1-1	Embedded NIC 1 Port 1
NIC.Embedded.1-1-1	Embedded NIC 1 Port 1 Partition 1
NIC.Slot.1-1	NIC in Slot 1 Port 1
NIC.Slot.1-2	NIC in Slot 1 Port 2
Video.Embedded.1-1	Embedded Video Controller
HostBridge.Embedded.1-1	Embedded Host Bridge 1
ISABridge.Embedded.1-1	Embedded ISA Bridge 2
P2PBridge.Embedded.1-1	Embedded P2P Bridge 3

FQDD of System Component Name	Easy-to-use Name
P2PBridge.Mezzanine.2B-1	Embedded Host Bridge in Mezzanine 1 (Fabric B)
USBUHCI.Embedded.1-1	Embedded USB UHCI 1
USBOHCI.Embedded.1-1	Embedded USB OHCI 1
USBEHCI.Embedded.1-1	Embedded USB EHCI 1
Disk.SATAEmbedded.A-1	Disk on Embedded SATA Port A
Optical.SATAEmbedded.B-1	Optical Drive on Embedded SATA Port B
TBU.SATAExternal.C-1	Tape Back-up on External SATA Port C
Disk.USBFront.1-1	Disk connected to front USB 1
Floppy.USBBack.2-1	Floppy-drive connected to back USB 2
Optical.USBFront.1-1	Optical drive connected to front USB 1
Disk.USBInternal.1	Disk connected to Internal USB 1
Optical.iDRACVirtual.1-1	Virtually connected optical drive
Floppy.iDRACVirtual.1-1	Virtually connected floppy drive
Disk.iDRACVirtual.1-1	Virtually connected disk
Floppy.vFlash.<string>	vFlash SD Card Partition 2
Disk.vFlash.<string>	vFlash SD Card Partition 3
iDRAC.Embedded.1-1	iDRAC
System.Embedded.1-1	System
HardDisk.List.1-1	Hard Drive C:
BIOS.Embedded.1-1	System BIOS
BIOS.Setup.1-1	System BIOS Setup
PSU.Slot.1	Power Supply 1
Fan.Embedded.1	Fan 1
System.Chassis.1	Blade Chassis
LCD.Chassis.1	LCD

FQDD of System Component Name	Easy-to-use Name
Fan.Slot. 1	Fan 1
Fan.Slot. 2	Fan 2
...	...
Fan.Slot. 9	Fan 9
MC.Chassis.1	Chassis Management Controller 1
MC.Chassis.2	Chassis Management Controller 2
KVM.Chassis.1	KVM
IOM.Slot.1	IO Module 1
...	...
IOM.Slot.6	IO Module 6
PSU.Slot.1	Power Supply 1
...	...
PSU.Slot.6	Power Supply 6
CPU.Socket.1	CPU 1
System.Modular.2	Blade 2
DIMM.Socket.A1	DIMM A1

Using the System Setup and boot manager

System Setup enables you to manage your system hardware and specify BIOS-level options.

The following keystrokes provide access to system features during startup:

Table 9. System setup keystrokes

Keystroke	Description
<F2>	Opens the System Setup page.
<F10>	Opens System Services and starts Lifecycle Controller, which supports systems management features such as operating system deployment, hardware diagnostics, firmware updates, and platform configuration, using a GUI. The feature set available in Lifecycle Controller is determined by the iDRAC license installed.
<F11>	Opens the BIOS Boot Manager or the Unified Extensible Firmware Interface (UEFI) Boot Manager, depending on the boot configuration of the system.
<F12>	Starts Preboot Execution Environment (PXE) boot.


From System Setup, you can:

- Change the NVRAM settings after you add or remove hardware
- View the system hardware configuration
- Enable or disable integrated devices
- Set performance and power management thresholds
- Manage system security

You can access System Setup using the:

- Standard graphical browser, which is enabled by default
- Text browser, which is enabled using **Console Redirection**

To enable **Console Redirection**, in **System Setup**, select **System BIOS** → **Serial Communication screen** → **Serial Communication**, select **On with Console Redirection**.


 **NOTE:** By default, help text for the selected field is displayed in the graphical browser. To view the help text in the text browser, press <F1>.

Choosing the system boot mode

System Setup enables you to specify the boot mode for installing your operating system:

- BIOS boot mode (the default) is the standard BIOS-level boot interface.
- UEFI boot mode is an enhanced 64-bit boot interface based on Unified Extensible Firmware Interface (UEFI) specifications that overlays the system BIOS.

You must select the boot mode in the **Boot Mode** field of the **Boot Settings** screen of System Setup. Once you specify the boot mode, the system boots in the specified boot mode and you then proceed to install your operating system from that mode. Thereafter, you must boot the system in the same boot mode (BIOS or UEFI) to access the installed operating system. Trying to boot the operating system from the other boot mode will cause the system to halt at startup.

 **NOTE:** Operating systems must be UEFI-compatible to be installed from the UEFI boot mode. DOS and 32-bit operating systems do not support UEFI and can only be installed from the BIOS boot mode.

 **NOTE:** For the latest information on supported operating systems, go to dell.com/ossupport.

Entering System Setup


1. Turn on or restart your system.
2. Press <F2> immediately after you see the following message:

<F2> = System Setup

If your operating system begins to load before you press <F2>, allow the system to finish booting, and then restart your system and try again.


Responding to error messages

If an error message is displayed while the system is booting, make a note of the message. For more information, see System Error Messages.

 **NOTE:** After installing a memory upgrade, it is normal for your system to display a message the first time you start your system.


Using the system setup navigation keys

Keys	Action
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
<Enter>	Allows you to type in a value in the selected field (if applicable) or follow the link in the field.
Spacebar	Expands or collapses a drop-down menu, if applicable.
<Tab>	Moves to the next focus area.

 **NOTE:** For the standard graphics browser only.

<Esc> Moves to the previous page till you view the main screen. Pressing **<Esc>** in the main screen displays a message that prompts you to save any unsaved changes and restarts the system.

<F1> Displays the System Setup help file.

 **NOTE:** For most of the options, any changes that you make are recorded but do not take effect until you restart the system.

System Setup options


System Setup main screen


 **NOTE:** Press <Alt><F> to reset the BIOS or UEFI settings to their default settings.

Menu Item	Description
System BIOS	This option is used to view and configure BIOS settings.
iDRAC Settings	This option is used to view and configure iDRAC settings.
Device Settings	This option is used to view and configure device settings.

System BIOS screen

 **NOTE:** The options for System Setup change based on the system configuration.

 **NOTE:** System Setup defaults are listed under their respective options in the following sections, where applicable.

Menu Item	Description
System Information	Displays information about the system such as the system model name, BIOS version, Service Tag, and so on.
Memory Settings	Displays information and options related to installed memory.
Processor Settings	Displays information and options related to the processor such as speed, cache size, and so on.
SATA Settings	Displays options to enable or disable the integrated SATA controller and ports.  NOTE: The SATA setting is not available on the PowerEdge R720xd server.
Boot Settings	Displays options to specify the boot mode (BIOS or UEFI). Enables you to modify UEFI and BIOS boot settings.
Integrated Devices	Displays options to enable or disable integrated device controllers and ports, and to specify related features and options.
Serial Communication	Displays options to enable or disable the serial ports and specify related features and options.



Menu Item	Description
System Profile Settings	Displays options to change the processor power management settings, memory frequency, and so on.
System Security	Displays options to configure the system security settings like, system password, setup password, TPM security, and so on. It also enables or disables support for local BIOS update, the power and NMI buttons on the system.
Miscellaneous Settings	Displays options to change the system date, time, and so on.

System information screen


Menu Item	Description
System Model Name	Displays the system model name.
System BIOS Version	Displays the BIOS version installed on the system.
System Service Tag	Displays the system Service Tag.
System Manufacturer	Displays the name of the system manufacturer.
System Manufacturer Contact Information	Displays the contact information of the system manufacturer.



Memory settings screen

Menu Item	Description
System Memory Size	Displays the amount of memory installed in the system.
System Memory Type	Displays the type of memory installed in the system.
System Memory Speed	Displays the system memory speed.
System Memory Voltage	Displays the system memory voltage.
Video Memory	Displays the amount of video memory.
System Memory Testing	Specifies whether system memory tests are run during system boot. Options are Enabled and Disabled . By default, the System Memory Testing option is set to Disabled .
Memory Operating Mode	Specifies the memory operating mode. The options available are Optimizer Mode , Advanced ECC Mode , Mirror Mode , Spare Mode , Spare with Advanced ECC Mode ,

Menu Item	Description
	and Dell Fault Resilient Mode . By default, the Memory Operating Mode option is set to Optimizer Mode .
	 NOTE: The Memory Operating Mode can have different defaults and available options based on the memory configuration of your system.
	 NOTE: The Dell Fault Resilient Mode establishes an area of memory that is fault resilient. This mode can be used by an operating system that supports the feature to load critical applications or enables the operating system kernel to maximize system availability.
Node Interleaving	If this field is Enabled , memory interleaving is supported if a symmetric memory configuration is installed. If Disabled , the system supports Non-Uniform Memory architecture (NUMA) (asymmetric) memory configurations. By default, Node Interleaving option is set to Disabled .
Serial Debug Output	By default, it is set to disabled.

Processor settings screen


Menu Item	Description
Logical Processor	Allows you to enable or disable logical processors and display the number of logical processors. If the Logical Processor option is set to Enabled , the BIOS displays all the logical processors. If this option is set to Disabled , the BIOS only displays one logical processor per core. By default, the Logical Processor option is set to Enabled .
QPI Speed	Allows you to set the QuickPath Interconnect (QPI) data rate settings. By default, the QPI Speed option is set to Maximum data rate .  NOTE: QPI Speed displays only when both the processors are installed.
Alternate RTID (Requestor Transaction ID) Setting	Allows you to allocate more RTIDs to the remote socket, increasing cache performance between the sockets or work in normal mode for NUMA. By default, the Alternate RTID (Requestor Transaction ID) Setting is set to Disabled .
Virtualization Technology	Allows you to enable or disable the additional hardware capabilities provided for virtualization. By default, the Virtualization Technology option is set to Enabled .
Adjacent Cache Line Prefetch	Allows you to optimize the system for applications that require high utilization of sequential memory access. By default, the Adjacent Cache Line Prefetch option is set to Enabled . You can disable this option for applications that require high utilization of random memory access.
Hardware Prefetcher	Allows you to enable or disable the hardware prefetcher. By default, the Hardware Prefetcher option is set to Enabled .
DCU Streamer Prefetcher	Allows you to enable or disable the Data Cache Unit (DCU) streamer prefetcher. By default, the DCU Streamer Prefetcher option is set to Enabled .

Menu Item	Description
DCU IP Prefetcher	Allows you to enable or disable the Data Cache Unit (DCU) IP prefetcher. By default, the DCU IP Prefetcher option is set to Enabled .
Execute Disable	Allows you enable or disable execute disable memory protection technology. By default, the Execute Disable option is set to Enabled .
Logical Processor Idling	Allows you to enable or disable the OS capability to put logical processors in the idling state in order to reduce power consumption. By default, the option is set to Disabled .
Number of Cores per Processor	Allows you to control the number of enabled cores in each processor. By default, the Number of Cores per Processor option is set to All .
Processor 64-bit Support	Specifies if the processor(s) support 64-bit extensions.
Processor Core Speed	Displays the maximum core frequency of the processor.
Processor Bus Speed	Displays the bus speed of the processors.  NOTE: The processor bus speed option displays only when both the processors are installed.
Processor 1	 NOTE: The following settings are displayed for each processor installed in the system.
Family-Model-Stepping	Displays the family, model and stepping of the processor as defined by Intel.
Brand	Displays the brand name reported by the processor.
Level 2 Cache	Displays the total L2 cache.
Level 3 Cache	Displays the total L3 cache.
Number of Cores	Displays the number of cores per processor.





SATA Settings Screen

Menu Item	Description
Embedded SATA	Allows the embedded SATA to be set to Off, ATA, AHCI, or RAID mode. By default, Embedded SATA is set to AHCI Mode .
Port A	Auto enables BIOS support for the device attached to SATA port A. By default, Port A is set to Auto .
Port B	Auto enables BIOS support for the device attached to SATA port B. By default, Port B is set to Auto .
Port C	Auto enables BIOS support for the device attached to SATA port C. By default, Port C is set to Auto .
Port D	Auto enables BIOS support for the device attached to SATA port D. By default, Port D is set to Auto .

Menu Item	Description
Port E	Auto enables BIOS support for the device attached to SATA port E. By default, Port E is set to Auto .
Port F	Auto enables BIOS support for the device attached to SATA port F. By default, Port F is set to Auto .




 **NOTE:** Ports A, B, C, and D are used for the backplane drives, port E for the optical drive (CD/DVD), and port F for the tape drive.

Boot settings screen

Menu Item	Description
Boot Mode	<p>Allows you to set the boot mode of the system.</p> <p> CAUTION: Switching the boot mode may prevent the system from booting if the operating system is not installed in the same boot mode.</p> <p>If the operating system supports UEFI, you can set this option to UEFI. Setting this field to BIOS allows compatibility with non-UEFI operating systems. By default, the Boot Mode option is set to BIOS.</p> <p> NOTE: Setting this field to UEFI disables BIOS Boot Settings menu. Setting this field to BIOS disables the UEFI Boot Settings menu.</p>
Boot Sequence Retry	Allows you to enable or disable the boot sequence retry feature. If this field is enabled and the system fails to boot, the system reattempts the boot sequence after 30 seconds. By default, the Boot Sequence Retry option is set to Disabled .
BIOS Boot Settings	Allows you to enable or disable BIOS Boot options. <p> NOTE: This option is enabled only if the boot mode is BIOS.</p>
UEFI Boot Settings	Allows you to enable or disable UEFI Boot options. The Boot options include IPv4 PXE and IPv6 PXE . By default, the UEFI PXE boot protocol is set to IPv4 . <p> NOTE: This option is enabled only if the boot mode is UEFI.</p>
One-Time Boot	Allows you to enable or disable a one-time boot from a selected device.



Integrated devices screen

Menu Item	Description
Integrated RAID Controller	Allows you to enable or disable the integrated RAID controller. By default, the Integrated RAID Controller option is set to Enabled .
User Accessible USB Ports	Allows you enable or disable the user accessible USB ports. Selecting Only Back Ports On disables the front USB ports and selecting All Ports Off disables both front and back USB ports. By default, the User Accessible USB Ports option is set to All Ports On .


Menu Item	Description
Internal USB Port	Allows you to enable or disable the internal USB port. By default, the Internal USB Port option is set to On .
Internal SD Card Port	Enables or disables the system's internal SD card port. By default, the Internal SD Card Port option is set to On .  NOTE: This option is displayed only if IDSDM is installed on the system board.
Internal SD Card Redundancy	If set to Mirror mode, data is written on both SD cards. If any one of the SD card fails, data is written to the active SD card. Data from this card is copied to the replacement SD card at the next boot. By default, Internal SD Card Redundancy option is set to Mirror .  NOTE: This option is displayed only if IDSDM is installed on the system board.
Integrated Network Card 1	Allows you to enable or disable the integrated network card 1. By default, the Integrated Network Card 1 option is set to Enabled .
OS Watchdog Timer	Allows you to enable or disable the OS watchdog timer. When this field is enabled, the operating system initializes the timer and the OS watchdog timer helps in recovering the operating system. By default, the OS Watchdog Timer option is set to Disabled .
Embedded Video Controller	Allows you to enable or disable the Embedded Video Controller . By default, the embedded video controller is set to Enabled .
SR-IOV Global Enable	Allows you to enable or disable the BIOS configuration of Single Root I/O Virtualization (SR-IOV) devices. By default, the SR-IOV Global Enable option is set to Disabled .
Memory Mapped I/O above 4GB	Allows you to enable support for PCIe devices that require large amounts of memory. By default, the option is set to Enabled .
Slot Disablement	Allows you to enable or disable available PCIe slots on your system. The Slot Disablement feature controls the configuration of PCIe cards installed in the specified slot.  CAUTION: Slot disablement must be used only when the installed peripheral card is preventing booting into the Operating System or causing delays in system startup. If the slot is disabled, both the Option ROM and UEFI driver are disabled.



Serial communications screen

Menu Item	Description
Serial Communication	Allows you to select serial communication devices (Serial Device 1 and Serial Device 2) in the BIOS. BIOS console redirection can also be enabled and the port address can be specified. By default, Serial Communication option is set to On without Console Redirection .
Serial Port Address	Allows you to set the port address for serial devices. By default, the Serial Port Address option is set to Serial Device 1=COM2, Serial Device 2=COM1 .


Menu Item	Description
	 NOTE: Only Serial Device 2 can be used for Serial Over LAN (SOL). To use console redirection by SOL, configure the same port address for console redirection and the serial device.
External Serial Connector	<p>Allows you to associate the external serial connector to serial device 1, serial device 2, or remote access device. By default, the External Serial Connector option is set to Serial Device1.</p>  NOTE: Only Serial Device 2 can be used for SOL. To use console redirection by SOL, configure the same port address for console redirection and the serial device.
Failsafe Baud Rate	<p>Displays the failsafe baud rate for console redirection. The BIOS attempts to determine the baud rate automatically. This failsafe baud rate is used only if the attempt fails and the value must not be changed. By default, the Failsafe Baud Rate option is set to 11520.</p>
Remote Terminal Type	<p>Allows you to set the remote console terminal type. By default, the Remote Terminal Type option is set to VT 100/VT 220.</p>
Redirection After Boot	<p>Allows you to enable or disable to the BIOS console redirection when the operating system is loaded. By default, the Redirection After Boot option is set to Enabled.</p>


System profile settings screen

Menu Item	Description
System Profile	<p>Allows you to set the system profile. If you set the System Profile option to a mode other than Custom, the BIOS automatically sets the rest of the options. You can only change the rest of the options if the mode is set to Custom. By default, the System Profile option is set to Performance Per Watt Optimized (DAPC). DAPC is Dell Active Power Controller.</p>  NOTE: The following parameters are available only when the System Profile is set to Custom .
CPU Power Management	<p>Allows you to set the CPU power management. By default, the CPU Power Management option is set to System DBPM (DAPC). DBPM is Demand-Based Power Management.</p>
Memory Frequency	<p>Allows you to set the memory frequency. By default, the Memory Frequency option is set to Maximum Performance.</p>
Turbo Boost	<p>Allows you to enable or disable the processor to operate in turbo boost mode. By default, the Turbo Boost option is set to Enabled.</p>
C1E	<p>Allows you to enable or disable the processor to switch to a minimum performance state when it is idle. By default, the C1E option is set to Enabled.</p>
C States	<p>Allows you to enable or disable the processor to operate in all available power states. By default, the C States option is set to Enabled.</p>


Menu Item	Description
Monitor/Mwait	<p>Allows you to enable Monitor/Mwait instructions in the processor. By default, the Monitor/Mwait option is set to Enabled for all system profiles, except Custom.</p> <p> NOTE: This option can be disabled only if the C States option in Custom mode is disabled.</p> <p> NOTE: When C States is enabled in Custom mode, changing the Monitor/Mwait setting does not impact system power/performance.</p>
Memory Patrol Scrub	Allows you to set the memory patrol scrub frequency. By default, the Memory Patrol Scrub option is set to Standard .
Memory Refresh Rate	Allows you to set the memory refresh rate. By default, the Memory Refresh Rate option is set to 1x .
Memory Operating Voltage	Allows you to set the DIMM voltage selection. When set to Auto , the system automatically sets the system voltage to the optimal setting based on the DIMM capacity and the number of DIMMs installed. By default, the Memory Operating Voltage option is set to Auto .
Collaborative CPU Performance Control	When set to Enabled , the CPU power management is controlled by the OS DBPM and the System DBPM (DAPC). By default, the option is set to Disabled .

System security screen

Menu Item	Description
Intel AES-NI	Improves the speed of applications by performing encryption and decryption using the Advanced Encryption Standard Instruction Set and is set to Enabled by default.
System Password	Allows you to set the system password. This option is set to Enabled by default and is read-only if the password jumper is not installed in the system.
Setup Password	Allows you to set the setup password. This option is read-only if the password jumper is not installed in the system.
Password Status	Allows you to lock the system password. By default, the Password Status option is set to Unlocked .
TPM Security	Allows you to control the reporting mode of the Trusted Platform Module (TPM). By default, the TPM Security option is set to Off . You can only modify the TPM Status, TPM Activation , and Intel TXT fields if the TPM Status field is set to either On with Pre-boot Measurements or On without Pre-boot Measurements .
TPM Activation	Allows you to change the operational state of the TPM. By default, the TPM Activation option is set to No Change .
TPM Status	Displays the TPM status.
TPM Clear	<p> CAUTION: Clearing the TPM results in the loss of all keys in the TPM. The loss of TPM keys may affect booting to the operating system.</p> <p>Allows you to clear all the contents of the TPM. By default, the TPM Clear option is set to No.</p>

Menu Item	Description
Intel TXT	Allows you to enable or disable Intel Trusted Execution Technology (TXT). To enable Intel TXT , Virtualization Technology must be enabled and TPM Security must be Enabled with Pre-boot measurements. By default, the Intel TXT option is set to Off .
BIOS Update Control	Allows you to update the BIOS using either DOS or UEFI shell-based flash utilities. For environments that do not require local BIOS updates, it is recommended to set this option to Disabled . By default, the BIOS Update Control option is set to Unlocked .  NOTE: BIOS updates using the Dell Update Package are not affected by this option.
Power Button	Allows you to enable or disable the power button on the front of the system. By default, the Power Button option is set to Enabled .
NMI Button	Allows you to enable or disable the NMI button on the front of the system. By default, the NMI Button option is set to Disabled .
AC Power Recovery	Allows you to set how the system reacts after AC power is restored to the system. By default, the AC Power Recovery option is set to Last .
AC Power Recovery Delay	Allows you to set how the system supports staggering of power up after AC power is restored to the system. By default, the AC Power Recovery Delay option is set to Immediate .
User Defined Delay (60s to 240s)	Allows you to set the User Defined Delay when the User Defined option for AC Power Recovery Delay is selected.


Miscellaneous settings

Menu Item	Description
System Time	Allows you to set the time on the system.
System Date	Allows you to set the date on the system.
Asset Tag	Displays the asset tag and allows you to modify it for security and tracking purposes.
Keyboard NumLock	Allows you to set whether the system boots with the NumLock enabled or disabled. By default the Keyboard NumLock is set to On .  NOTE: This option does not apply to 84-key keyboards.
Report Keyboard Errors	Allows you to set whether keyboard-related error messages are reported during system boot. By default, the Report Keyboard Errors option is set to Report .
F1/F2 Prompt on Error	Allows you to enable or disable the F1/F2 prompt on error. By default, F1/F2 Prompt on Error is set to Enabled .
In-System Characterization	This option enables or disables In-System Characterization . By default, In-System Characterization is set to Enabled .


System and setup password features

You can create a system password and a setup password to secure your system. To enable creation of the system and setup password, the password jumper must be set to enabled. For more information on the password jumper settings, see System Board Jumper Settings.


System password	This is the password that you must enter before you can boot your system.
Setup password	This is the password that you must enter to access and make changes to the BIOS or UEFI settings of your system.

 **CAUTION: The password features provide a basic level of security for the data on your system.**

 **CAUTION: Anyone can access the data stored on your system if the system is running and unattended.**

 **NOTE:** Your system is shipped with the system and setup password feature disabled.

Assigning a system and/or setup password

 **NOTE:** The password jumper enables or disables the System Password and Setup Password features. For more information on the password jumper settings, see the system Owner's Manual.

You can assign a new **System Password** and/or **Setup Password** or change an existing **System Password** and/or **Setup Password** only when the password jumper setting is enabled and **Password Status** is **Unlocked**. If the Password Status is **Locked**, you cannot change the System Password and/or Setup Password.

If the password jumper setting is disabled, the existing System Password and Setup Password is deleted and you need not provide the system password to boot the system.


To assign a system and/or setup password:

1. To enter System Setup, press <F2> immediately after a power-on or reboot.
2. In the **System Setup Main Menu**, select **System BIOS** and press <Enter>. The **System BIOS** screen is displayed.
3. In the **System BIOS** screen, select **System Security** and press <Enter>. The **System Security** screen is displayed.
4. In the **System Security** screen, verify that **Password Status** is **Unlocked**.
5. Select **System Password**, enter your system password, and press <Enter> or <Tab>. Use the following guidelines to assign the system password:
 - A password can have up to 32 characters.
 - The password can contain the numbers 0 through 9.
 - Only the following special characters are allowed: space, ("), (+), (.), (-), (,), (/), (:), (@), (\), (!), (').

A message prompts you to re-enter the system password.

6. Re-enter the system password that you entered earlier and click **OK**.
7. Select **Setup Password**, enter your system password and press <Enter> or <Tab>. A message prompts you to re-enter the setup password.

8. Re-enter the setup password that you entered earlier and click **OK**.
9. Press <Esc> to return to the System BIOS screen. Press <Esc> again, and a message prompts you to save the changes.


 **NOTE:** Password protection does not take effect until the system reboots.

Deleting or changing an existing system and/or setup password


Ensure that the Password jumper is set to enabled and the **Password Status** is **Unlocked** before attempting to delete or change the existing System and/or Setup password. You cannot delete or change an existing System or Setup password if the **Password Status** is **Locked**.

To delete or change the existing System and/or Setup password:


1. To enter System Setup, press <F2> immediately after a power-on or restart.
2. In the **System Setup Main Menu**, select **System BIOS** and press <Enter>. The **System BIOS** screen is displayed.
3. In the **System BIOS Screen**, select **System Security** and press <Enter>. The **System Security** screen is displayed.
4. In the **System Security** screen, verify that **Password Status** is **Unlocked**.
5. Select **System Password**, alter or delete the existing system password and press <Enter> or <Tab>.
6. Select **Setup Password**, alter or delete the existing setup password and press <Enter> or <Tab>.

 **NOTE:** If you change the System and/or Setup password a message prompts you to re-enter the new password. If you delete the System and/or Setup password, a message prompts you to confirm the deletion.

7. Press <Esc> to return to the System BIOS screen. Press <Esc> again, and a message prompts you to save the changes.

 **NOTE:** You can disable password security while logging on to the system. To disable the password security, turn on or reboot your system, type your password and press <Ctrl><Enter>.

Using your system password to secure your system


 **NOTE:** If you have assigned a setup password, the system accepts your setup password as an alternate system password.

1. Turn on or reboot your system.
2. Type your password and press <Enter>.

When **Password Status** is **Locked**, type the password and press <Enter> when prompted at reboot.

If an incorrect system password is entered, the system displays a message and prompts you to re-enter your password. You have three attempts to enter the correct password. After the third unsuccessful attempt, the system displays an error message that the system has halted and must be powered down.

Even after you shut down and restart the system, the error message is displayed until the correct password is entered.

 **NOTE:** You can use the **Password Status** option in conjunction with the **System Password** and **Setup Password** options to protect your system from unauthorized changes.

Operating with a setup password enabled


If **Setup Password** is **Enabled**, enter the correct setup password before modifying most of the System Setup options.

If you do not enter the correct password in three attempts, the system displays the message


```
Invalid Password! Number of unsuccessful password attempts: <x> System Halted!  
Must power down.
```

Even after you shut down and restart the system, the error message is displayed until the correct password is entered. The following options are exceptions:

- If **System Password** is not **Enabled** and is not locked through the **Password Status** option, you can assign a system password.
- You cannot disable or change an existing system password.

 **NOTE:** You can use the Password Status option in conjunction with the **Setup Password** option to protect the system password from unauthorized changes.

Entering The UEFI boot manager

 **NOTE:** Operating systems must be 64-bit UEFI-compatible (for example, Microsoft Windows Server 2008 x64 version) to be installed from the UEFI boot mode. DOS and 32-bit operating systems can only be installed from the BIOS boot mode.

The Boot Manager enables you to:

- Add, delete, and arrange boot options.
- Access System Setup and BIOS-level boot options without restarting.

To enter the Boot Manager:



1. Turn on or restart your system.
2. Press **<F11>** after you see the following message:

```
<F11> = UEFI Boot Manager
```

If your operating system begins to load before you press **<F11>**, allow the system to finish booting, and then restart your system and try again.

Using the boot manager navigation keys

Key	Description
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
<Enter>	Allows you to type in a value in the selected field (if applicable) or follow the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.
<Tab>	Moves to the next focus area.

Key	Description
	 NOTE: For the standard graphics browser only.
<Esc>	Moves to the previous page till you view the main screen. Pressing <Esc> in the main screen exits the Boot Manager and proceeds with system boot.
<F1>	Displays the System Setup help file.
	 NOTE: For most of the options, any changes that you make are recorded but do not take effect until you restart the system.

Boot manager screen


Menu Item	Description
Continue Normal Boot	The system attempts to boot to devices starting with the first item in the boot order. If the boot attempt fails, the system continues with the next item in the boot order until the boot is successful or no more boot options are found.
BIOS Boot Menu	Displays the list of available BIOS boot options (marked with asterisks). Select the boot option you wish to use and press <Enter>.
UEFI Boot Menu	Displays the list of available UEFI boot options (marked with asterisks). Select the boot option you wish to use and press <Enter>. The UEFI Boot Menu enables you to Add Boot Option , Delete Boot Option , or Boot From File .
Driver Health Menu	Displays a list of the drivers installed on the system and their health status.
Launch System Setup	Enables you to access the System Setup.
System Utilities	Enables you to access the BIOS Update File Explorer, run the Dell Diagnostics program, and reboot the system.

UEFI boot menu

Menu Item	Description
Select UEFI Boot Option	Displays the list of available UEFI boot options (marked with asterisks), select the boot option you wish to use and press <Enter>.
Add Boot Option	Adds a new boot option.
Delete Boot Option	Deletes an existing boot option.
Boot From File	Sets a one-time boot option not included in the boot option list.

Embedded system management


The Dell Lifecycle Controller provides advanced embedded systems management throughout the server's lifecycle. The Lifecycle Controller can be started during the boot sequence and can function independently of the operating system.

 **NOTE:** Certain platform configurations may not support the full set of features provided by the Lifecycle Controller.

For more information about setting up the Lifecycle Controller, configuring hardware and firmware, and deploying the operating system, see the Lifecycle Controller documentation at dell.com/support/home.

iDRAC settings utility

The iDRAC Settings utility is an interface to set up and configure the iDRAC parameters using UEFI. You can enable or disable various iDRAC parameters using the iDRAC Settings Utility.

 **NOTE:** Accessing some of the features on the iDRAC Settings Utility requires the iDRAC Enterprise License upgrade.

For more information on using iDRAC, see the *iDRAC User's Guide* at dell.com/esmmanuals.

Entering the iDRAC settings utility

1. Turn on or restart the managed system.
2. Press <F2> during POST.
3. In the **System Setup Main Menu** page, click **iDRAC Settings**.
The iDRAC Settings screen is displayed.