

DELL Lifecycle Controller Remote Services v2.70.70.70 User Guide

[Home](#) » [Dell](#) » **DELL Lifecycle Controller Remote Services v2.70.70.70 User Guide** 



Lifecycle Controller Remote Services v2.70.70.70 User Guide

Contents

- [1 Lifecycle Controller Remote Services v2.70.70.70](#)
- [2 Introduction](#)
- [3 Key features](#)
- [4 Remote Services Features](#)
- [5 Getting started with API collateral and links](#)
- [6 Terms and definitions](#)
- [7 Documents / Resources](#)
- [8 Related Posts](#)

Lifecycle Controller Remote Services v2.70.70.70

Notes, cautions, and warnings



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



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.

© 2018 – 2019 Dell Inc. or its subsidiaries. All rights reserved. Dell, EMC, and other trademarks are trademarks of Dell Inc. or its subsidiaries. Other trademarks may be trademarks of their respective owners.

Introduction

Dell Lifecycle Controller provides advanced embedded systems management to perform systems management tasks such as deploy, configure, update, maintain, and diagnose. 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.

Dell Lifecycle Controller Remote Services further enables remote systems management in a one-to-many method. Remote services is accessible over the network using the secure web services interface and can be programmatically utilized by applications and scripts. Remote services enable management consoles to perform one-to-many bare-metal server provisioning.

The combination of the Provisioning Server feature to identify and authenticate the attached Dell system to the network and integration with one-to-many management consoles reduces the manual steps required for server setup and management. The Server Configuration Profiles provide a single view of all the system settings that can be imported and exported from the server to perform one-to-many cloning operations. The interface is aimed at simplifying many tasks, some of which include remotely deploying an operating system, remote update and inventory, and remotely automating the setup and configuration of new and already-deployed Dell systems.

Lifecycle Controller reduces the time and number of steps taken to accomplish tasks, reduces potential for error, enhances server and application uptime and security, and results in more efficient IT management. Developed on the industry standard Unified Extensible Firmware Interface (UEFI) platform, Web Services for Management (WSMAN) interfaces, and Redfish management interfaces, Lifecycle Controller provides an open environment for console integration that also allows custom scripting for Lifecycle Controller. Leading systems management consoles such as, Microsoft System Center Configuration Manager, BMC Software BladeLogic Operations Manager, VMware vCenter have integrated Dell Lifecycle Controller to utilize its features and capabilities to an existing infrastructure, where these consoles are installed.

Topics:

- Advantages of using Lifecycle Controller
- Benefits of using iDRAC with Lifecycle Controller
- Key features
- New in this release
- Advantages of using Lifecycle Controller Remote Services
- Licensable features in Lifecycle Controller
- About iDRAC RESTful API with Redfish and Web Service APIs
- About Lifecycle Controller API
- About one-to-many management achieved
- Other information that you may need
- Accessing documents from the Dell EMC support site
- Contacting Dell

Advantages of using Lifecycle Controller

The iDRAC with Lifecycle Controller technology in the server's embedded management allows you to perform useful tasks such as configuring BIOS and hardware settings, deploying operating systems, changing RAID settings, and saving hardware profiles.

Together, iDRAC and Lifecycle Controller provide a robust set of management functions that can be used throughout the entire server lifecycle.

Dell Lifecycle Controller simplifies server lifecycle management — from provisioning, deployment, patching and updating to servicing and user customization — both locally and remotely. Lifecycle Controller includes managed and persistent storage that embeds systems management features and Operating System device drivers directly on the server. This eliminates the media-based system management tools and utilities traditionally needed for systems management.

Benefits of using iDRAC with Lifecycle Controller

The benefits include:

- **Increased Uptime** — Early notification of potential or actual failures that help prevent a server failure or reduce recovery time after a failure.
- **Improved Productivity and Lower Total Cost of Ownership (TCO)** — Extending the reach of administrators to larger numbers of distant servers can make IT staff more productive while driving down operational costs such as travel.
- **Enhanced Security**— By providing secure access to remote servers, administrators can perform critical management functions while maintaining server and network security.
- **Increased Efficiency**— With Lifecycle Controller Remote Services, you can automate the server configuration management using Dell OpenManage Essentials and Dell partner consoles, which enables efficient administration as server deployments scale.

For more information about iDRAC, see the Integrated Dell Remote Access Controller User's Guide available at www.dell.com/esmmanuals

Key features

You can perform the following systems management tasks using Lifecycle Controller-Remote Services:

- Install operating systems and drivers
- Manage licensing
- Perform server firmware update including BIOS, iDRAC/LC, backplane and enclosure controllers, RAID, NIC/CNA, Fibre Channel host bus adapters, PCIe SSDs, SAS HDDs and SSDs, and SATA HDD
- Part Replacement and automatic restore of server configuration
- Get hardware inventory information
- Get and set NIC/CNA, Fibre Channel host bus adapters (FC-HBA), PCIe SSDs, and RAID configuration
- Get and set BIOS configuration and BIOS passwords
- Full export of Lifecycle log and add work notes
- Export current- and factory-shipped hardware inventory log
- Manage, attach, and boot to vFlash SD card partitions
- Lock the controllers using the local key
- Export and import the server profile
- Import server license

- View firmware details during server update
- Export and import Server Configuration Profiles
- Schedule and track the status of the update and configuration
- Import and export Server Configuration Profiles file that contains information about a component configuration
- Out-of-band server performance monitoring
- Enhance security using hash password
- View logs, monitoring, and server information, and configure the network parameters of a server using a mobile device
- Delete server-related information
- View the managed system using Physical Computer System View
- Manage the web server certificate
- Configure the USB management port
- View SupportAssist Collection to resolve business-critical issues
- Replace motherboard using Import Server Profile feature

New in this release

The updates supported in this release are:

- Added support for firmware update for Intel P4510 and P4610 SSD drives.
- Added support for iDSDM device firmware update.
- Added firmware update support via HTTPS.
- Removed the default URL from the FTP server settings option.
- The default URL on the HTTPS page is downloads.dell.com.

Advantages of using Lifecycle Controller Remote Services

When Dell examined the most common management tasks and the inefficiencies associated with them, it discovered that the additional time taken for performing management tasks was not because of the tools, but it was because of how the functions were split between several tools. For example, the most common tasks such as provisioning, deploying, and updating required not only multiple tools and multiple media format, but also searching the Web for tools such as drivers and firmware. This traditional delivery model resulted in inefficient use of time, potential errors, and possible security risks. Lifecycle Controller-Remote Services addresses all these system management issues.

Licensable features in Lifecycle Controller

The Web Services-Management (WS-MAN) License and Privilege Specification encompasses all the license and privilege information required to utilize the WS-MAN API provided by the integrated Dell Remote Access Controller (iDRAC) with Lifecycle Controller.

It was delivered as part of the iDRAC (Express and Enterprise licenses, and vFlash SD card feature) starting with the 11th generation of Dell PowerEdge servers. On 12th and 13th generation of PowerEdge servers, the vFlash feature is included with the iDRAC Enterprise [license](#), so you need not separately license vFlash with Lifecycle Controller 2.0 and later. The 12th and 13th generation of PowerEdge servers of Dell use only Express or Enterprise licensing.

The Lifecycle Controller management capabilities are partitioned into distinct areas and represented by the Dell Common Information Model (DCIM) profile specifications that provide comprehensive details about each manageability feature or capability. These features may be free, partially licensed, or fully licensed. Also, the accessibility of a feature is defined by the credentials provided with the WS-MAN request and maps to the user-assigned privilege credentials, such as administrator-or read-only access.

About iDRAC RESTful API with Redfish and Web Service APIs

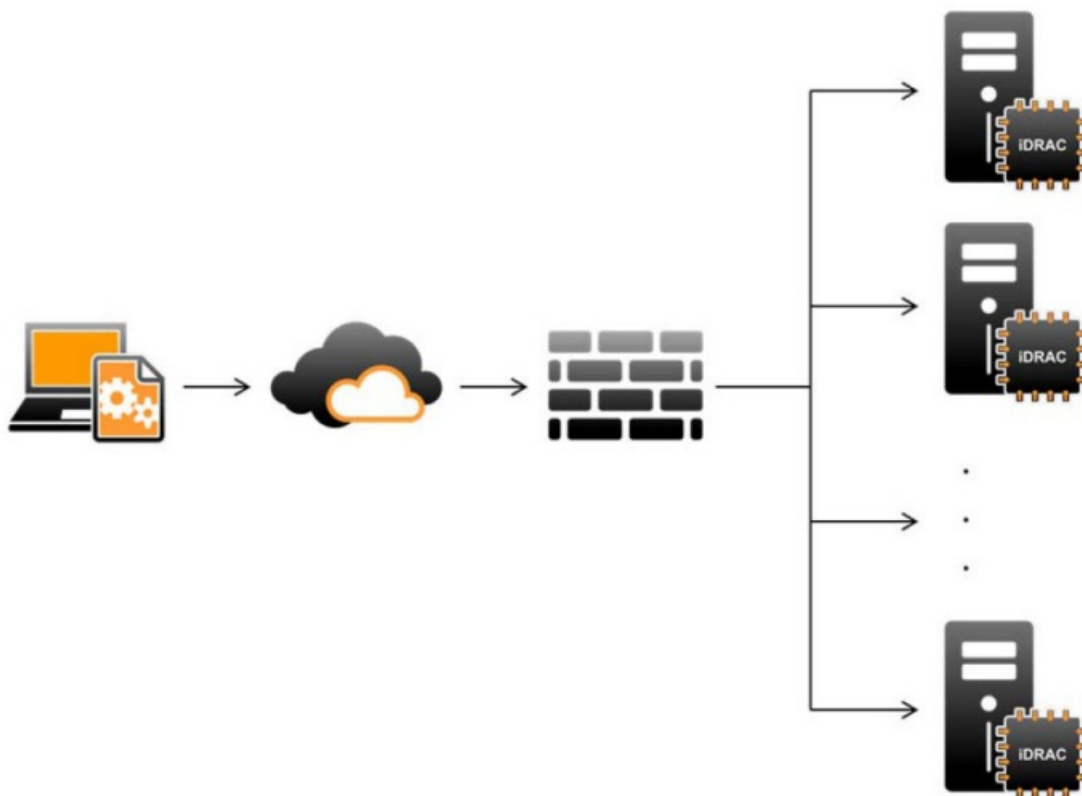
Web Services-Management (WSMan) is a Distributed Management Task Force's (DMTF) open standard, defining a Simple Object Access Protocol (SOAP)—based protocol for managing servers, devices, applications, and various Web Services. WS-MAN provides a common way for systems to access and exchange management information across the IT infrastructure.

DMTF is an industry organization that develops, maintains, and promotes standards for systems management in enterprise IT environments. The DMTF data model is complex and typically requires multiple transactions to accomplish simple operations such as specifying a user name and password, or giving administrator privileges to a user account. To reduce the number of transactions, Lifecycle Controller also offers a Dell data model for management that is based on an attribute model.

The iDRAC RESTful API expands upon the DMTF Redfish standard with Dell EMC-specific operations. It includes RESTful server configuration, modular server feature support, and detailed OS networking inventory and status. The Scalable Platforms Management Forum (SPMF) has published the Distributed Management Task Force (DMTF)'s Redfish API. It is an open industry standard specification and schema which is designed to meet the needs of IT administrators for simple, modern, and secure management of scalable platform hardware. Redfish is a NextGen management standard using a data model representation inside a hypermedia RESTful interface. The data model is defined in terms of a standard and machine-readable schema, with the payload of the messages expressed in JSON and the protocol using OData v4. Redfish is a hypermedia API, and can represent various implementations using a consistent interface. It has mechanisms for discovering and managing data center resources, handling events, and managing long-lived tasks.

About Lifecycle Controller API

Lifecycle Controller-Remote Services is a standards-based interface that enables consoles to integrate, for example, bare-metal provisioning and one-to-many operating system deployments for remotely located servers. Dell's Lifecycle Controller takes advantage of the capabilities of both Lifecycle Controller GUI and Lifecycle Controller-Remote Services to deliver significant improvement and simplification of server deployment.



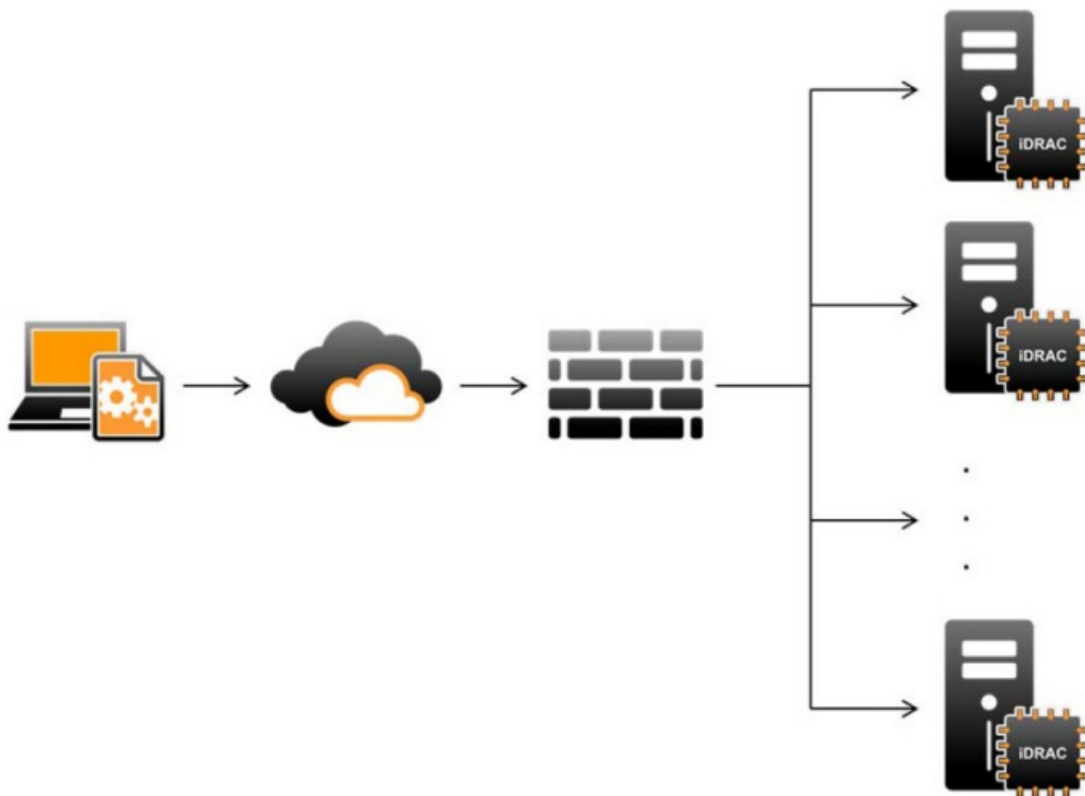
Lifecycle controller also supports local one-to-one system management tasks through a graphical user interface (GUI) using the server's KVM or the Virtual Console in iDRAC for operating system installation, updates, configuration, and for running diagnostics on single and local servers. This eliminates the need for multiple option ROMs for hardware configuration. For more information, see Lifecycle Controller User's Guide, available at www.delltechcenter.com/lc.



Lifecycle Controller-Remote Services features are available based on the type of license (that is, Basic Management, iDRAC Express, iDRAC Express for Blades, or iDRAC Enterprise) you purchase. Only licensed features are available in the iDRAC web interface and Lifecycle Controller-Remote Services. For more information about managing licenses, see iDRAC User's Guide. For more information about Lifecycle Controller-Remote Services licensing, see Licensing.

About one-to-many management achieved

A management station sends WS-MAN and iDRAC RESTful API with Redfish commands over a network and these commands pass securely through the network from outside the firewall and maintain security.



Other information that you may need

In addition to this guide, you can refer the following guides available at dell.com/support/home or dell.com/idracmanuals:

- The Lifecycle Controller Online Help provides information about the fields available on the GUI and the descriptions for the same. To view the online help information in Lifecycle Controller user interface, click Help in the upper-right corner, or press <F1>.
- The Lifecycle Controller Release Notes is available with the product. To read the Release Notes in Lifecycle Controller user interface, click About , 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 users or technicians.
- The Dell iDRAC Licensing White paper at www.delltechcenter.com. This document provides an overview of

iDRAC digital licensing and how the latest licensing is different from iDRAC available in the Dell PowerEdge servers. The white paper also provides information on iDRAC Express and other Enterprise value offerings.

- The Dell Lifecycle Controller Remote Services For 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 for performing systems management tasks.
- The Integrated Dell Remote Access Controller (iDRAC) User's Guide provides information about configuring and using iDRAC for rack, tower, and blade servers to remotely manage and monitor a system and the system's shared resources through a network.
- The Dell Repository Manager User's 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 are included with a 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 a rack solution describe how to install a system into a rack.
- The Getting Started Guide provides an overview of system features, setting up the 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.delltechcenter.com.

Accessing documents from the Dell EMC support site

You can access the required documents using the following links:

- For Dell EMC Enterprise Systems Management documents — www.dell.com/esmmanuals
- For Dell EMC OpenManage documents — www.dell.com/openmanagemanuals
- For Dell EMC Remote Enterprise Systems Management documents — www.dell.com/esmmanuals

- For iDRAC and Dell Lifecycle Controller documents — www.dell.com/idracmanuals
- For Dell EMC OpenManage Connections Enterprise Systems Management documents — www.dell.com/esmmanuals
- For Dell EMC Serviceability Tools documents — www.dell.com/serviceabilitytools
- 1. Go to www.dell.com/support.
 2. Click Browse all products.
 3. From All products page, click Software, and then click the required link from the following:
 - Analytics
 - Client Systems Management
 - Enterprise Applications
 - Enterprise Systems Management
 - Public Sector Solutions
 - Utilities
 - Mainframe
 - Serviceability Tools
 - Virtualization Solutions
 - Operating Systems
 - Support
 4. To view a document, click the required product and then click the required 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.

Remote Services Features

Using Lifecycle Controller-Remote Services, you can perform the following operations:

- Deploy and Configure
- Monitor
- Maintain
- Create and schedule jobs

Topics:

- Deployment and configuration
- Monitor
- Maintain
- Job management

Deployment and configuration

Using various Lifecycle Controller-Remote Services' capabilities, you can perform different configurations on a system throughout its lifecycle. You can perform operations such as BIOS, iDRAC, RAID, FC-HBA, and NIC configurations, and operating system deployment on the system.

Server configuration profiles

The server configuration profiles file contains the component configuration information that is used to apply the configuration for BIOS, iDRAC, RAID, NIC, FC-HBA, System, and Lifecycle Controller by importing the file to a target system.

The export and import of Server Configuration Profiles are supported by the WS-MAN and iDRAC RESTful API with Redfish APIs.

For more information and white papers, see Server Cloning with Server Configuration Profiles and Creating and Managing Server Configuration Profiles documents available at www.delltechcenter.com.

BIOS configuration

The BIOS and boot configuration feature gets and sets any of the configurable BIOS attributes that are exposed in BIOS UEFI HII. You can perform the following operations:

- Retrieve current configuration of BIOS inventory
- Retrieve current boot configuration settings
- Manage the boot order configuration
- Change the BIOS boot mode or UEFI boot mode
- Manage BIOS passwords
- Change the boot order
- Enable or disable boot sources
- One-time boot support to any device listed in the boot order

iDRAC configuration

The iDRAC configuration feature is used to manage the properties and interfaces for running system management tasks related to the management of basic properties of iDRAC. The remote access controller properties and attributes are divided into views to provide a simple methodology for the clients to query the iDRAC views and set the iDRAC attributes.

You can perform the following operations:

- Retrieve current iDRAC configuration and inventory
- Get and set any configurable iDRAC attribute
- Manage iDRAC user accounts

RAID configuration

The RAID configuration feature is used to manage the properties and capabilities of the RAID storage. The RAID storage is modeled using a collection of attributes, where there are collections for the enclosures, storage adapters, logical disks, physical disk drives, and PCIeSSD devices. Also, there is a configuration service that contains all the methods used to configure the RAID storage.

You can perform the following operations:

- Setting the boot VD
- Change PD state (force offline/online)

- Change persistent hot spare setting
- Replace VD physical disk
- Unlock secure foreign configuration
- Perform prepare to remove method for PCIe SSD drives.
- Perform secure erase method for PCIe SSD devices and SED drives.
- Clear preserve cache.
- Expand the online capacity.
- Migrate the RAID level.
- Set external enclosure asset tag / name.
- Cancel rebuild physical disk.
- Retrieve current configuration of RAID inventory.
- Delete all virtual disks and unassign all the hot spare physical disk drives.
- Prepare any foreign physical disk drives for inclusion in the local configuration.
- Manage hot spares (assign / unassign global and dedicated).
- Manage keys for self-encrypting drives.
- Manage virtual disks. You can perform the following:
 - Create a single virtual disk. After the virtual disk is created, the FQDD of the virtual disk changes.
 - Initialize (fast or slow) the virtual disk using the physical disk drives attached to the PERC controller.
 - Delete a virtual disk from the PERC controller.
- Configure the following RAID attributes:
 - Virtual disks—Read Policy, Write Policy, and Disk Cache Policy
 - Controllers—Background Initialization Rate, Check Consistency Mode, Check Consistency Rate, Copy Back Mode, Possible load balance modes, Patrol Read Mode, Rebuild Rate, and Reconstruction Rate.
- Change RAID-ready states of the physical disk drives.
- View PCIeSSD and extended card information.
- Reset PERC controller configuration.
- Import foreign configurations such that virtual disks are not lost after moving physical disks. The controllers provide support for auto import of foreign configuration.
- Clear foreign configuration on physical disk drives attached to a controller.
- Set patrol read mode to avoid disk failures and data loss or corruption.
- Check the consistency of the redundancy information for redundant virtual disks.
- Cancel the check consistency operation that is in progress on a virtual disk.
- Blink or unblink the LEDs on the physical disk drives included in the virtual disk.
- Create, change, or delete the security key using the Local Key Management (LKM) feature on controllers that support encryption of the drives.

NOTE: On Dell's 13th generation PowerEdge server, you can now perform all RAID configuration jobs in real time without rebooting the host.

For more information on RAID configuration, see the SimpleRaid profile document available at https://downloads.dell.com/solutions/general-solution-resources/White-Papers/Dell_SimpleRAID_Profile.pdf. Also, see the iDRAC User's Guide available at www.dell.com/esmmanuals.

NIC configuration

Network Interface Controller (NIC) configuration feature is used to set up or modify configuration settings for supported NIC cards (for example, Intel, QLogic, and Broadcom). These configuration settings can be set or updated both locally and remotely using Lifecycle Controller-Remote Services.

The NICs supported by Lifecycle Controller provide an array of networking features converged into a single controller:

- Traditional NIC capabilities
- Internet Small Computer System Interface over Ethernet (iSCSI) capabilities
- Fibre Channel over Ethernet (FCoE) capabilities

You can configure various device capabilities such as:

- Personalities (FCoE, ISOE, Layer 2 NIC)
- NIC partition bandwidth allocation
- Boot versus Offload
- I/O Identity

Operating system deployment

The operating system deployment feature is used to remotely deploy an operating system using WSMAN web services protocols that use CIFS and NFS network file sharing protocols. Remote activation of locally exposed embedded drivers such as a USB drive eliminates the need for physical media.

NOTE: By default the drivers are available with iDRAC and Lifecycle Controller for all the Dell supported operating systems.

You can perform the following operations:

- Get installed driver pack version and list of supported operating systems.
- Expose embedded OS deployment drivers for a selected operating system remotely. The drivers are attached to the server on an emulated USB device.
- Remote acquisition of embedded drivers for the selected operating system to a CIFS or NFS network share that can be used later for operating system deployment.
- Boot to an ISO image on a CIFS or NFS network share to initiate an operating system installation.
- Download ISO to vFlash SD card and boot from the card to initiate an operating system installation.
- Connect an ISO from CIFS or NFS network share, attaching it as virtual USB CD-ROM device to the server, and booting the server to the ISO, every time the server restarts.
- One time boot to PXE.
- One time boot to hard disk.
- Get the list of MAC addresses of all supported NICs present on the server.
- Deploy operating system on iSCSI and FCoE LUN.

Near Field Communication using the QuickSync feature Using the QuickSync feature, you can:

- View basic server information such as Service Tag, MAC address, NIC data, firmware versions, operating system, and so on.
- View log and monitoring information of a server.
- Configure network parameters of a server.

After viewing or editing the information, you can troubleshoot or configure using a mobile device. To use this

feature, you must install the OpenManage Mobile (OMM) software application on your mobile device and enable the bezel on the server.

The QuickSync feature enables your mobile device to act as a proximity reader which reads data on the server when held at a distance of less than 20 mm from the server front panel. You can perform most of the tasks that you complete by using an LCD panel. The system information is the basic hardware inventory information retrieved from NFC. The attributes allow you to set the access, check the presence of QuickSync feature, enable or disable the Inactivity Timer, set the inactivity timeout value.

NOTE: This feature is supported only on Android mobile devices.

Configuring advanced security using hash password

You can set user passwords and BIOS passwords using a one-way hash format in iDRAC available on the 13th generation Dell PowerEdge servers. The user authentication mechanism is not affected (except for SNMPv3 and IPMI) and you can provide the password in plain text format.

With the new password hash feature, you can:

- Generate your own SHA256 hashes to set iDRAC user passwords and BIOS passwords. New attributes are created to represent the hash representation of the password.
- Export the Server Configuration Profiles file with the password that has the hash values. Use the ExportSystemConfiguration method and include the password hash values that should be exported to the IncludeInExport parameter.

The hash password can be generated with and without Salt using SHA256. Whether the Salt string is used or null, it should always be set along with the SHA256SystemPassword.



NOTE: If the iDRAC user account's password is set with the SHA256 password hash (SHA256Password) only and not the other hashes (SHA1v3Key, MD5v3Key), authentication through SNMPv3 is lost. Authentication through IPMI is always lost when hash is used to set the user account's password.

For more information on using hash password, see the iDRAC Card and BIOS and BootManagement profile documents available at https://downloads.dell.com/solutions/general-solution-resources/White_Papers/Dell-BIOSandBootManagementProfile.pdf.

Configuring USB management port

On the 13th generation of PowerEdge servers monitored by iDRAC, you can perform the following functions on a USB port and USB drive:

- Manage the status of the server's USB management port. If the status is disabled, iDRAC does not process a USB device or host connected to the managed USB port.
- Configure the USB Management Port Mode to determine whether the USB port is used by iDRAC or the operating system.
- View the overcurrent alert generated when a device exceeds the power requirement permitted by USB specification.

Configure the overcurrent alert to generate the WS-Events.

- View the inventory of the USB device such as FQDD, device description, protocol, vendor ID, product ID, and so on, when the device is connected.
- Configure a server by using files stored on a USB drive that is inserted in to a USB port, which is monitored by an iDRAC.

This configuration allows creation of a job to track progress and logging the results in the Lifecycle log. The

rules for discovering the Server Configuration profile and naming are the same as DHCP provisioning.

NOTE: The USB configuration setting controls whether the configuration of the system is allowed from a USB drive. The default setting only applies the configuration from the USB when the iDRAC user password and BIOS are still default.

For more information about the USB device management, see the USB device profile document available at https://downloads.dell.com/solutions/general-solution-resources/White%20Papers/Dell_USBDeviceProfile.pdf.

Monitor

Using various Lifecycle Controller-Remote Services capabilities, you can monitor a system throughout its lifecycle. Current and factory-shipped hardware inventory, Lifecycle Log, System Event Log, Firmware Inventory are some of the features that help you monitor the system.

Collecting system inventory

When Collect System Inventory On Restart (CSIOR) is set to enabled, Lifecycle Controller performs an inventory and collects the configuration information for all hardware on every system restart. Also, the system inventory collection also detects any changes in hardware. If the Part Replacement feature is enabled and CSIOR detects that the managed hardware is replaced, Lifecycle Controller restores the previous configuration and firmware on the newly installed device based on the inventory collected during the previous system restart.

The CSIOR setting is enabled by default and it can be disabled locally by using Lifecycle Controller or remotely with RACADM, WS-MAN, or iDRAC RESTful API with Redfish. You can change the settings to one of the following:

- **Enable**—Hardware inventory and configuration information is collected on every system restart. Collecting system inventory may affect the boot time depending on the hardware present in the system.
- **Disable**—Hardware inventory and configuration information is not collected on every system restart. The usage of many features depends on the inventory information updates. Features such as Easy Restore and Part Replacement may not contain the latest information when CSIOR is disabled. In-band tools such as OMSA and DTK cannot configure BIOS when SIOR is disabled. Also, system information reported from out-of-band interfaces such as WS-MAN, iDRAC RESTful API with Redfish, and RACADM may not have correct information.

Hardware inventory

The hardware inventory information is cached on the persistent storage of Lifecycle Controller and is available to iDRAC and UEFI applications. It is used to export the hardware inventory from Lifecycle Controller to a text file on a remote share.

You can remotely query the inventory of hardware components. Each hardware inventory class contains important attributes about the hardware components.

For example, the Last System Inventory Time attribute identifies the last time a Collect System Inventory on Restart (CSIOR) was run. It is an important attribute as it indicates how recently the inventory was updated.

Hardware inventory and configuration information is available for the following components:

- Power Supply Unit
- Fan
- Memory
- CPU
- iDRAC
- PCI Device
- Video Card

- Flash SD Card
- NIC
- RAID
- BIOS
- System
- Sensor

Lifecycle log

Lifecycle logs contain entries for configuration and firmware updates of BIOS, Storage Controllers, LOMs, and add-in NIC cards, if supported. The Lifecycle log can be exported to a network share or saved to a USB drive. The Lifecycle Log is accessible through the iDRAC web interface, RACADM iDRAC RESTful API with Redfish, and WS-MAN interface.

The Lifecycle log provides the following information:

- iDRAC, BIOS, NIC, and RAID configuration change
- Logs of all the remote operations
- Firmware update history based on device, version, and date
- Error message IDs
- Host power events or reboots
- POST errors
- User login to any iDRAC interface

For more information about Event and Error Messages, see the Dell Event Message Reference Guide available at www.dell.com/support/manuals

System event log

The Lifecycle Log contains events related to system, storage devices, network devices, firmware updates, configuration changes, license messages, and so on. However, the system events are also available as a separate log called the System Event Log (SEL).

When a system event occurs on a managed system, it is recorded in the SEL. The same SEL entries are also available in the Lifecycle Log.

Firmware inventory

Lifecycle Controller-Remote Services provide information about each of the component firmware installed on the target system and the available firmware images are cached in the Lifecycle Controller.

Additional information contained in the available properties is:

- Firmware type
- Installed and previous (rolled back) firmware versions
- Installation date
- Vendor IDs
- Revision number

NOTE: Configuration changes and firmware updates made within the operating system may not be properly reflected in inventory until a server restart is performed.

Event alerts

Alerts and actions can be set for certain events that occur on a managed system. An event occurs when the status of a system component has changed to the predefined condition. If an event matches an event filter and this filter is configured to generate an alert (email, SNMP trap, or IPMI alert), an alert is sent to one or more configured destinations. If the same event filter is also configured to perform an action (such as reboot, power cycle, or power off the system), the action is performed. You can set only one action for an event.

SupportAssist Collection

SupportAssist Collection is used to provide information about health report of hardware, Operating System (OS), and software applications installed on a server. This feature includes application information collected by Dell System E-Support Tool (DSET).

This report is used by administrators to resolve business-critical issues. Examples of data collected in the SupportAssist

Collection are:

- Hardware inventory
- Information on the server, Lifecycle Controller, and its components
- BIOS order boot information
- Lifecycle Controller log entries
- Firmware-related information
- Flash SD Card partition information
- TTY logs for PERC controllers and NVMe PCIe SSD drives

NOTE: The Tech Support Report feature is renamed as SupportAssist Collection in the iDRAC web interface. This feature is still referred as Embedded Tech Support Report in the RACADM and WS-MAN interfaces.

Out-of-band server performance monitoring

Using this feature, you can monitor the performance index of CPU, memory, and I/O. Intel ME supports Compute Usage Per Second (CUPS) functionality for monitoring the performance. The monitoring is independent of the OS and does not use CPU resources. The Intel ME displays a platform CUPS sensor that provides the computation, memory and I/O resource utilization value in the form of a platform CUPS Index. iDRAC monitors this CUPS index for overall system utilization and also the instant value of CPU, Memory, and I/O utilization index.

NOTE: To use this feature, iDRAC enterprise license is required.

For more information about monitoring the out-of-band performance, see the Dell Base Metrics Profile and Dell Sensors Profile document available at www.delltechcenter.com/systemsmanagement.

Maintain

Using various Lifecycle Controller-Remote Services capabilities, you can maintain the health of a system throughout its lifecycle.

You can use features such as remote firmware management, part replacement, server profile import or export, and provisioning server to maintain a system using Lifecycle Controller-Remote Services.

Server configuration profiles—export or import

Lifecycle Controller-Remote Services can export or import a Server Configuration Profiles file. The export operation collects the configuration information for BIOS, iDRAC, RAID, NIC, FC-HBA, System, and Lifecycle Controller and stores it in a single file that is copied to a local file or a network share. The Import operation imports the file from a local file or a network share, and applies the previously saved or updated configurations contained in the file to a system.

Import and export can be performed using the RACADM, WS-MAN, or iDRAC RESTful API with Redfish interfaces.

For more information, see RESTful Server Configuration with iDRAC REST API, Server Cloning, Server Cloning with Server Configuration Profiles, and Creating and Managing Server Configuration Profiles documents available at www.delltechcenter.com/systemsmanagement.

Exceptions while importing server profile

On certain Dell devices, successful application of a server configuration profile requires two imports. The first import of the profile enables hidden devices that are then configured with a second import.

Two imports are required while performing following actions:

- Enabling RAID mode on storage controllers — PERC S110 and PERC S130 require two imports – one to set the embedded SATA controller to RAID mode and the second to configure the RAID controller for operations such as creating a virtual disk.

Example: If the EmbSata BIOS attribute on the import system is not set to RAIDMode, then the first import

must contain the following:

```
<Component FQDD="BIOS.Setup.1-1"> <Attribute Name="EmbSata">RaidMode</Attribute> </Component>
```

The second server import is to apply the configuration on the PERC controller:

```
<Component FQDD="RAID.Embedded.1-1"> <Attribute Name="RAIDresetConfig">False</Attribute> <Attribute  
Name="RAIDforeignConfig">Ignore</Attribute> <Component FQDD="Disk.Virtual.262145:RAID.Embedded.1-1">  
<Attribute Name="RAIDaction">Create</Attribute> <Attribute Name="Name">Virtual Disk 1</Attribute> <Attribute  
Name="Size">0</Attribute> <Attribute Name="StripeSize">128</Attribute> <Attribute  
Name="SpanDepth">1</Attribute> <Attribute Name="SpanLength">2</Attribute> <Attribute  
Name="RAIDTypes">RAID 0</Attribute> <Attribute Name="IncludedPhysicalDiskID">Disk.Direct.0-  
0:RAID.Embedded.1-1</Attribute> <Attribute Name="IncludedPhysicalDiskID">Disk.Direct.1-  
1:RAID.Embedded.1-1</Attribute> </Component> <Component FQDD="Disk.Direct.0-0:RAID.Embedded.1-1">  
<Attribute Name="RAIDPDState">Ready</Attribute> </Component> <Component FQDD="Disk.Direct.1-  
1:RAID.Embedded.1-1"> <Component FQDD="Disk.Direct.1-1:RAID.Embedded.1-1">  
<Attribute Name="RAIDPDState">Ready</Attribute> </Component> </Component>
```

Enabling PCI slots — PCI slots in the system that are disabled in the BIOS require two imports – one to enable the slot and another to configure the card in the slot. Example If the Slot1 BIOS attribute on the import system is disabled, the first import must contain the following:

```
<Component FQDD="BIOS.Setup.1-1"> <Attribute Name="Slot1">Enabled</Attribute> </Component>
```

A second import is required to configure the device in slot 1.

Firmware update

You can update or rollback component firmware from a network resource. A rollback operation is used to install the previous version of a component firmware. It also provides the ability to update using a repository and schedule automatic updates.

Follow the order below to update or rollback a firmware:

1. Initiate and download an image.
2. Create a reboot job.
3. Schedule an update job.
4. Monitor a job until the job is finished.



NOTE: Immediate updates such as diagnostics, driver pack, and iDRAC with Lifecycle Controller are not required to be scheduled. These update processes move from downloading state to completed state. Updating iDRAC resets the iDRAC when the job is marked completed.

For more information about automatic update, see Automatic Updates in Dell PowerEdge 12G Servers white paper available at www.delltechcenter.com/systemsmanagement.

Server license — import

Lifecycle Controller-Remote Services can import (restore) the server license of a host system. These operations are commonly used during motherboard replacement. You can import the license from a USB drive or a network share such as CIFS or NFS.

Provisioning Server

The Provisioning Server feature in iDRAC allows newly installed servers to automatically discover the remote management console that hosts the Provisioning Server. The Provisioning Server provides custom administrative user credentials to iDRAC so that the management console can discover and manage the newly installed managed system.

If you order a Dell system with the Provisioning Server feature enabled (factory default setting is disabled), then iDRAC is delivered with DHCP enabled and user accounts disabled. If the Provisioning Server feature is disabled, you can manually enable this feature and disable the default administrative account using the iDRAC Settings utility. For more information about the iDRAC Settings utility, see iDRAC User's Guide.

For more information about Provisioning Server, see the Lifecycle Controller Management profile document

available at www.delltechcenter.com/systemsmanagement.

Retire or repurpose the server

By using the Retire or Repurpose feature, you can delete server-related data such as system configuration, logs, PERC NV cache (if available), and so on. However, an iDRAC license cannot be deleted by using this feature. Use LC-Remote Services to delete information about the following:

- BIOS
- iDRAC
- LC Data
- Diagnostics
- Driver Pack

The user information is permanently deleted and you cannot retrieve the information. However, BIOS and iDRAC remain functional, whereas diagnostics and driver pack can be re-installed.

Managing the web server certificate

By default, a self-signed certificate is available on iDRAC. You can generate a certificate signing request (CSR) and use the CSR to create a Certificate Authority (CA) signed certificate. To use this feature, the following methods are introduced in the iDRACCard profile:

- GenerateSSLCSR
- ExportSSLCertificate
- ImportSSLCertificate
- DeleteSSLCertificate

The method to support export and import operations are:

- Web Server Certificate
- CA certificate for Directory Service
- Custom Signing Certificate

To use the new certificate, restart the iDRAC. A new method iDRACReset is added for this purpose.

For more information about managing the web server certificate, see the iDRAC Card Profile document available at www.delltechcenter.com/systemsmanagement.

Viewing the managed computer system using the Physical Computer System View

Physical Computer System View (PCSV) provides the view of a managed system such as current state and configuration. You can directly access PCSV using PowerShell commands. Using PCSV you can:

- Receive information about the managed elements.
- Directly enumerate the CIM_PhysicalComputerSystem from the console without any prior knowledge of a particular class.
- Use a registered profile to enumerate the implemented features.
- Invoke certain method based on implemented features.

For more information about viewing the managed computer system using PCSV, see the Physical Computer System View Profile document available at www.delltechcenter.com/systemsmanagement.

Job management

Lifecycle Controller allows you to create, schedule, track, and manage system management tasks that are referred to as jobs.

A single job or array of jobs can be run immediately or scheduled to run later. Multiple jobs are listed in the order

of job execution sequence. If a system must reboot at the scheduled start time, a reboot job must be added to the job list.

Remote Services provides the following functions to manage Lifecycle Controller jobs:

- **Creating Jobs** — Create specific types of jobs to apply configurations.
- **Scheduling Jobs and Job Queues** — Run multiple jobs in a single restart of the system using the `SetupJobQueue()` method.
If a job is created without setting the start time, use the `SetupJobQueue()` method to set the schedule and order of execution. The job is set up for execution at the time that was specified.
- **Deleting Jobs** — Delete a specified existing job or all jobs at once.
- **Reporting all Jobs** — Report all jobs using a single command.
- **Reporting scheduled Jobs** — Generate a report of all scheduled jobs using a selection filter of `JobStatus = Scheduled`.

Job types

There are two types of jobs — system-created jobs (implicit) and user-created jobs (explicit).

- **System-created jobs** are created when you run specific Remote Services tasks. For example, Remote Services features such as export hardware inventory, export license, create persistent storage partition, and so on create a job and return the job ID. Polling the job status determines the completion status of the task.
- **User-created jobs** such as `CreateTargetedConfigJob`, `CreateRebootJob`, and `InstallFromURI` are used to apply user configurations for RAID, NIC, BIOS, and so on. They can be scheduled to run immediately or at a scheduled time.

NOTE: If FIPS is enabled, you cannot perform any actions associated with the vFlash SD card, such as configuring the vFlash SD card, exporting or backing up server profile to the vFlash, or importing server profile using vFlash.

Table 1. System and User Created Jobs

System-created jobs	User-created jobs
<ul style="list-style-type: none">● Export Factory Configuration● Export Hardware Inventory● Export Lifecycle log● vFlash (Initialize)● vFlash (Create Partition)● vFlash (Format Partition)● vFlash (Attach Partition)● vFlash (Detach Partition)● vFlash (Export Data from Partition)● vFlash (Create Partition using Image)	<ul style="list-style-type: none">● RAID configuration● BIOS configuration● NIC configuration● FC-HBA configuration● iDRAC configuration● System configuration● Software update (BIOS, NIC, RAID, and so on)● Reboot

System status

This feature is used to remotely obtain the overall Remote Services API status that includes real-time CEM status, the host system status, and the remote service status. The overall status is displayed in the Status output parameter.

After the job is complete in Automated Task Application (previously SSM), the job status is immediately updated in

the job store.

The job is immediately moved to the Completed state and synchronization starts. After the synchronization is successful, the system is in the Ready state.

Getting started with API collateral and links

Getting started with any feature of Lifecycle Controller begins at the Dell TechCenter Lifecycle Controller home page — www.delltechcenter.com/lc.

The home page contains various sections that reference URLs, and these referenced URLs are direct links to the corresponding sections.

You can follow these steps to get started using the Lifecycle Controller API:

1. Identify the feature or the required management operation.
2. Determine how the API is constructed for the desired management activity.
3. Utilize a client to access the API.
4. Use the best practices work flows for the client to interact with the API to accomplish the activity.

Topics:

- WSMAN Profiles
- WSMAN MOF WSDL and XSD API definitions
- Web services interface guide
- WSMAN Best practices guide
- Attribute registry XML
- Event message registry XML
- XML schemas
- Redfish
- Authorization and licensing requirements for API access
- White papers

WSMAN Profiles

Profiles describe the behavior of each feature and necessary classes, properties, methods, and configurable management attributes that represent the feature. The Profile documents explain the features that are supported in the Lifecycle ControllerRemote Services provided within the context of the CIM architecture. Profile specifications are organized around different management areas or domains.

Lifecycle Controller-related profiles

NOTE: To view the profile documents, on the Dell Knowledge base page, go to

<https://www.dell.com/support/home/knowledgebase>.

Table 2. Profiles

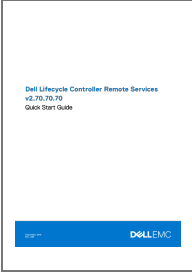
Profile Name	Description
Active Directory	The Active Directory Client Profile extends the management capabilities of referencing profiles by adding the capability to represent the configuration of Active Directory client service and the groups managed by the service.
Base Metrics	The DMTF Common Interface Model (DCIM) Base Metrics Profile extends the DMTF Base Metrics Profile to add Dell-specific implementation requirements for power-related metrics. The profile standardizes the units and description for the metrics, and provides static methodology for the clients to query the metrics without substantial traversal of the model.
Base Server and Physical Asset	The Base Server Profile is the autonomous profile that defines the classes used to describe basic server hardware and its related software.

Terms and definitions

The following table lists the terms used in this document and their definitions.

Table 5. Terms and definitions

Term	Definition
LC	Lifecycle Controller
Enumerate	Refers to WS-MAN ENUMERATE operation as described in Section 8.2 of DSP0226_V1.1 and Section 9.1 of DSP0227_V1.0
Get	Refers to WS-MAN GET operation as defined in Section 7.3 of DSP00226_V1.1 and Section 7.1 of DSP0227_V1.0
iDRAC	Integrated Dell Remote Access Controller management controller for blades, rack, and tower servers
USC	Unified Server Configurator
iSCSI	Internet Small Computer System Interface, an Internet Protocol (IP) based storage networking standard for linking data storage facilities
SSM	System Services Manager
CSIOR	Collect System Inventory on Restart
SSIB	System Services Information Block
UEFI	Unified Extensible Firmware Interface
BIOS	Basic Input/Output System
NIC	Network Interface Controller
FC-HBA	Fibre Channel — Host Bus Adapters
FQDD	Fully Qualified Device Description
LCL	Lifecycle Log
WSIG	Web Services Interface Guide
WSMAN	Web Service—Management

	<p>DELL Lifecycle Controller Remote Services v2.70.70.70 [pdf] User Guide Lifecycle Controller Remote Services v2.70.70.70, Lifecycle Controller, Remote Services v2.70.70.70</p>
---	---