



Anywhere, anytime remote server management

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Intensifying data center virtualization efforts are driving the need for effective remote server management. An all-in-one, out-of-band embedded systems management option from Dell helps simplify the remote management of Dell™ PowerEdge™ servers.

Adopting virtualization is a key strategy to enable Efficient IT and cloud computing initiatives. And with the proliferation of data center virtualization comes heightened demand for out-of-band systems management. Administrators require access to the physical components of a server and connected devices to perform tasks such as the initial deployment of an OS for a physical server or a hypervisor for a virtual machine. In addition, administrators can use out-of-band management for updating the BIOS and firmware and managing hardware settings—independent of the OS or hypervisor throughout a server's life cycle.

Integrated Dell Remote Access Controller 7 with Lifecycle Controller (iDRAC7) offers an all-in-one, out-of-band systems management option that allows administrators to remotely manage 12th-generation Dell PowerEdge servers throughout their life cycle. Traditionally, Dell systems management options have been offered across various media and formats. In iDRAC7, Dell has combined hardware enablement capabilities into a single, embedded controller that includes its own processor, power, and network connection. As a result, administrators can use iDRAC7 to manage PowerEdge servers anytime, anywhere, in any system state through out-of-band management. For example, iDRAC7 allows administrators to access servers when the host system is shut down.

iDRAC7 also enables agent-free monitoring of 12th-generation Dell PowerEdge servers. Because iDRAC7 does not have an agent footprint within the OS, hypervisor, or application, the server can be dedicated to running business applications and is not slowed down by extraneous management agents.

Streamlining management throughout the server life cycle

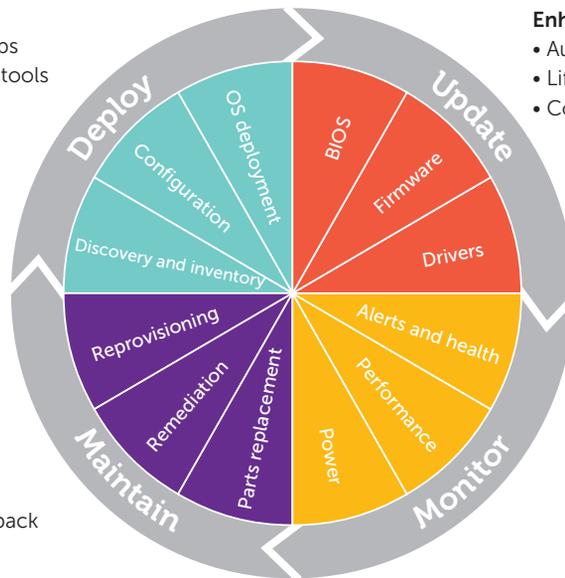
Delivered as part of iDRAC7, Lifecycle Controller is the engine for advanced embedded management that enables

Fast deployment and easy setup

- Reduced number of discovery steps
- Additional media or management tools not required
- Easy-to-follow setup wizards
- Automated configuration

High uptime

- Fast system repairs
- Fail-safe system updates with rollback
- Enhanced error messaging



Enhanced IT efficiency in change management

- Automation for low operator interaction time
- Life-cycle logging for automated tracking
- Component selectability to schedule update times

Agent-free monitoring

(for 12th-generation Dell PowerEdge servers)

- Consistency in managing servers
- Agent installation, updates, and certification not required
- High security because nonintrusive to software environment

Figure 1. iDRAC7 with Lifecycle Controller delivers differentiated management capabilities throughout a server's life cycle

simplified, streamlined, and automatable management through the life cycle of deploying, updating, monitoring, and maintaining servers (see Figure 1).

Accelerated deployment

To help automate server deployment, iDRAC7 provides an autodiscovery feature. Administrators can simply connect power and network cables to the host server, and iDRAC7 will search for and set up a Secure Sockets Layer (SSL) connection with the provisioning server. The provisioning server can remotely inventory, update, and configure the host server through the iDRAC Web services application programming interfaces (APIs). The provisioning server can then install the desired OS on the host server.

iDRAC7 also provides a system inventory feature, which helps administrators determine installed firmware versions and what versions are available for update or rollback. The inventory functionality is out-of-band and therefore does not rely on a running OS. The inventory report enumerates installed devices—including BIOS, network interface cards (NICs), iDRAC7, storage controller, and diagnostic modules—and available firmware.

With the embedded systems management provided by iDRAC7, the BIOS and firmware can be updated and configured remotely through a Web Services for Management (WS-Management) API or locally through the Lifecycle Controller console. Parameters for the BIOS, NIC, storage controller, and iDRAC7 can also be configured remotely out of band. For example, to change the boot order of the server, an administrator can simply send a WS-Management request to configure the BIOS to boot to a specific device. Because hardware configuration through iDRAC7 does not require an in-band OS agent, it can be performed on bare-metal and powered-down systems. Administrators can also stage the configuration so it happens at the next reboot.

iDRAC7 supports the features needed for OS deployment, which involves installing or reinstalling an OS onto a server as follows:

- Change the boot order so the server can boot to a boot loader to start a pre-OS environment
- Provide OS drivers to help ensure that the installed OS has the latest out-of-the-box drivers
- Boot to a specific image to start the deployment process

OS drivers are prepackaged into a driver pack or catalog at the factory and stored in persistent storage on the Lifecycle Controller. Administrators can easily download updates from dell.com for the driver pack on the Lifecycle Controller to obtain the latest release.

Remote updates

Firmware and BIOS updates are sometimes relegated to the "don't fix it if it isn't broken" category—often due to the complexity of the steps, the need for physical media, and the system downtime required to apply updates from the local console. A heterogeneous environment, where administrators must manage updates for servers running diverse operating systems and hypervisors, can complicate the process. And some servers may not have an OS installed at all.

The remote access functionality of iDRAC7 helps simplify the firmware and BIOS update process. Administrators can connect to iDRAC7 and issue a software installation request that points to a remote site with update payloads. iDRAC7 downloads the update payload and applies the update through the Lifecycle



Controller. Once the update is completed, the host system reboots to its original state with the new BIOS. During the process, administrators can stay connected to the system using iDRAC7.

Agent-free monitoring

In addition to monitoring power, thermal, processor, memory, and other traditional sensors, iDRAC7 includes expanded monitoring capabilities, such as real-time monitoring and inventory of storage and network controllers, without requiring an OS driver or agent. iDRAC7 has direct connectivity to these controllers and can communicate with them to obtain real-time health status and other vital data. When abnormal conditions or failures occur, iDRAC7 can send Simple Network Management Protocol (SNMP) traps, Intelligent Platform Management Interface (IPMI) events, or e-mail alerts to notify the administrator.

iDRAC7 monitors and inventories the RAID controller, physical and virtual disks, and disk enclosures. For the RAID controller, iDRAC7 tracks cache health, temperature, and battery status. It also reports on physical disk state, RAID state, drive security state, drive temperature, health of fan and power supplies in the disk enclosure, and several other metrics.

For network adapters, iDRAC7 monitors link status, network driver status, and transmit and receive statistics and errors. iDRAC7 also displays detailed NIC capabilities, including partitioning details, Media Access Control (MAC) addresses, and media type.

Administrators can access this information through the iDRAC7 graphical user interface (GUI), the remote access controller administrators (RACADM) command-line interface (CLI), and WS-Management APIs, as well as a central one-to-many console like Dell OpenManage™ Essentials.¹

Enhanced maintenance

iDRAC7 delivers comprehensive hardware configuration and related firmware export and import functionality. For example, through a few clicks in a GUI or a few remote commands, administrators can issue an export, or backup, request to save the BIOS and firmware versions and their relevant configuration settings to a variety of locally attached or virtual media, such as a Secure Digital (SD) card, USB device, or network share. Upon a hardware failure, administrators can issue another request to restore the captured image. Once the bits in the image are imported, the server reboots to update the firmware and then automatically restores the system settings, including NIC configuration, iDRAC license keys, and service tag number. This automation saves administrators time and avoids manual errors.

Under normal conditions, the latest firmware and drivers update older versions with enhanced functionality, bug fixes, and security patches. However, in some cases an applied update may not be compatible with the existing hardware. To address this issue, the Lifecycle Controller has a built-in roll-back feature for the BIOS and firmware that is easily accessible through the GUI or CLI.

During the rare failure of a motherboard or individual card, the replacement feature of the Lifecycle Controller enables easy restoration of firmware versions and configurations to the previous level. The process requires minimal input from the administrator, which avoids human error.

A key activity performed at the end of a server's life cycle is to destroy the configuration, log files, and private data attributes of the physical server. The iDRAC7 data wipe feature helps simplify this process with a single click.

Easing server management for Efficient IT

iDRAC7 is designed to provide powerful, easy-to-use remote management and configuration options for 12th-generation Dell PowerEdge servers. iDRAC7 alerts administrators to problems and warnings, enables streamlined out-of-band server management, and avoids the need for administrators to visit the server—even when the server is not operational. The embedded systems management functionality of iDRAC7 helps improve the overall availability of Dell servers and increase IT productivity, freeing administrators to work on projects that further strategic organizational goals. **PS**

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Learn more

Data center systems management:
dell.com/openmanage

Dell Lifecycle Controller:
qrs.ly/1q1p6ya

¹ For more information about Dell OpenManage Essentials, see "Streamlining basic hardware management," by Travis Zhao, Rob Cox, Enrico Bracalente, and Kevin Noreen, in *Dell Power Solutions*, 2012 Issue 1, content.dell.com/us/en/enterprise/dl/business-solutions-power-en/documents-ps1q12-20120192-zhao.pdf.aspx.