Enhanced features in iDRAC9 by using different order options, and at-the-box Systems Management for 14th generation Dell EMC PowerEdge servers

This technical white paper briefly describes new features and license options available in iDRAC9 with Lifecycle Controller, and then provides a matrix that compares availability of different features by using different license options.

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Contents

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Executive summary

This technical white paper provides an overview of the key changes to be aware of when you order a new 14th generation Dell EMC PowerEdge server. Many new configuration options and security improvements have created new default settings and order options that are different from previous generations. This technical white paper reviews the various options so that you configure your server in the manner that best suits your data center.

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1 iDRAC9 - The server industry's leading Embedded Management solution

The integrated Dell Remote Access Controller 9 (iDRAC9) with Lifecycle Controller application delivers advanced, agent-free local- and remote server administration. Embedded in every PowerEdge server, iDRAC9 provides a secure means to automate a multitude of common management tasks. Because iDRAC is embedded in every PowerEdge server, there is no additional software to install; just plug in power and network cables, and iDRAC with Lifecycle Controller is ready to go. Even before installing an operating system or hypervisor, IT administrators have a complete set of server management features at their fingertips. Also, maximize storage performance with up to 12 NVMe drives and ensure application performance scales easily.

With iDRAC9 in place across the Dell EMC PowerEdge portfolio, the same IT administration techniques and tools can be applied throughout. This consistent management platform allows easy scaling of PowerEdge servers as an organization's infrastructure requires growth. Customers will be able to use the iDRAC RESTful API for the latest in scalable administration methods of PowerEdge servers. With this API, iDRAC enables support for the Redfish standard and enhances it with Dell EMC extensions to optimize at-scale management of PowerEdge servers. Regardless of size though, the entire OpenManage portfolio of systems management tools allow every customer to tailor an effective, affordable solution for their environment.

1.1 iDRAC and OpenManage Essentials licensing

Each iDRAC9 with Lifecycle Controller comes with a basic level of functionality. Based on the server model ordered, licensing features differ and are available to best fit a customer's desired level of management functionality. A detailed chart of features is available in Appendix A.

OpenManage Essentials – Server Configuration Management

OpenManage Essentials – Server Configuration Management capabilities focus on the automation of PowerEdge server bare-metal deployment, quick and consistent replication of server configurations, and an automated maintenance process that helps ensure server configurations remain in compliance with a customer's predefined baseline setting(s). Standardized templates and processes are utilized to easily, accurately, and rapidly replicate server configurations and OS deployments, thus reducing the possibility of errors and ensuring server availability. Server configuration can be done as a single process—even before the server is ever turned on—to speed time to productivity.

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When choosing one of the iDRAC9 with Lifecycle Controller and OpenManage Essentials – Server Configuration Management licensing options, consider how you want to manage your server:
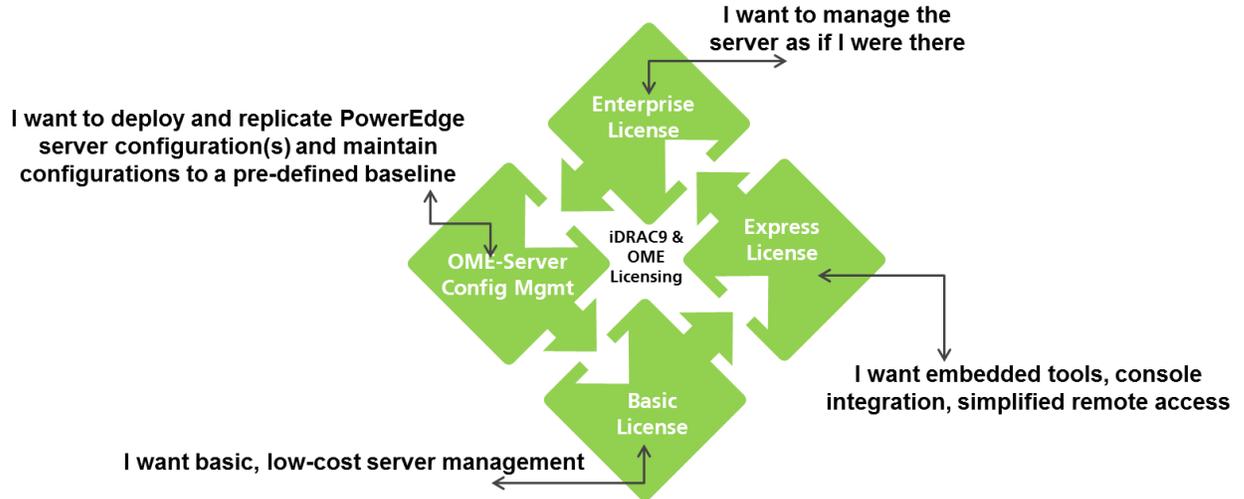
1.2 Order options at a glance

The following table provides a quick overview of the various order options for the 14th generation Dell EMC PowerEdge Servers. Many of these options are the same as previous generations, and/or the default option has been changed. Also, there are new features available only on the 14th generation iDRAC9. These changed items (default or new) are highlighted in yellow in the table.

These features and options are fully described following the chart.

Feature	Available Options in iDRAC9	Online default option
Factory-generated default iDRAC password		
	Factory-generated ID	✓
	Legacy ID	
iDRAC IP address		
	DHCP	✓
	DHCP with Zero Touch **(requires Enterprise License)**	
	Static	
	Provisioning server	
iDRAC NIC Setting		
	Dedicated	✓
	Shared LOM	
Optional iDRAC Quick Sync 2 (with OpenManage Mobile 2.0)		
	None	✓

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	BLE/Wi-Fi Direct	
Bezel options		
	No bezel option	✓
	Standard Dell EMC bezel	
	Dell EMC bezel with LCD panel	
Group manager (requires Enterprise License)		
	Enabled	✓
	Disabled	

1.3   iDRAC factory-generated default password

By default, all PowerEdge servers will ship with a factory-generated iDRAC password, to provide additional security. This password is generated at the factory and is located on the pull-out Information Tag located on the front of the chassis, adjacent to the server asset tag.

Legacy Password - Customers who prefer the known, legacy password–`calvin`–should choose this option. For security purposes, Dell EMC strongly recommends changing any initial password as part of the server deployment.

1.4   iDRAC IP settings—from the factory

Dell offers several options to best fit customers' existing environment for deploying a server. All of these can be set from the factory to allow an IT administrator to access the iDRAC with Lifecycle Controller to remotely configure the server. There is no charge for any of these options. Only one setting is possible.

iDRAC IP options:

- DHCP (default)
- DHCP with Zero-touch
- Static IP
- Provisioning Server

DHCP

New for 14G iDRAC9—all iDRAC versions will now ship from the factory with DHCP as the default factory setting. The DHCP option is for customers that have a Dynamic Host Configuration Protocol (DHCP) server already installed in their data center environment and who use iDRAC to automate or script the deployment process. The DHCP server can automatically assign the IP address, gateway, and subnet mask to the iDRAC.

If no other options are selected, iDRAC will be automatically configured for DHCP.

DHCP with Zero Touch

Another new option for 14G—For those customers who have adopted iDRAC's Server Configuration Profile (SCP), there is a new option which allows the iDRAC to connect with the DHCP server and configure itself

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with the additional files as noted in the DHCP server. iDRAC will apply configuration settings from the SCP that is defined in the DHCP scope options. See the 'White papers' section of **www.delltechcenter.com/idrac** for more information on Server Configuration Profiles.

Static IP

Prior to 14th generation, Static IP address was the default. For many customers, this is a preferred and known method. The iDRAC will be set to the known static IP address as noted in the iDRAC User's Guide. Customers who want the iDRAC to be configured to the static IP address from the factory must select this option.

Provisioning Server

This option is for customers who are using some type of provisioning server or tools such as OpenManage Integration with Microsoft System Center or the OpenManage Integration with VMware vCenter in their IT environment.

A provisioning server manages and automates a deployment or upgrade of an operating system and applications to a PowerEdge server. By enabling the Provisioning Server option, the servers will, on its first boot, search for a provisioning server to take control and begin the automated deployment or update process.

1.5   iDRAC NIC settings

While this option is not new, the ability to configure this setting at the factory is often overlooked. Since the 12th generation servers, there has been an option to have iDRAC traffic configured to whichever solution best fits the needs of the datacenter; either Dedicated NIC or Shared LOM.

- Dedicated NIC
    - o Enables the rear facing NIC labeled "iDRAC." This interface is not shared with the host operating system and routes the management traffic to a separate physical network, enabling it to be separated from the application traffic**.** Dell EMC Security Best Practices for iDRAC recommends by using the Dedicated NIC**.**
    - o This option implies that iDRAC's dedicated network port routes its traffic separately from the server's LOM or NIC ports. About managing network traffic, the "Dedicated" option allows iDRAC to be assigned an IP address from the same subnet or different subnet in comparison to the IP addresses assigned to the Host LOM or NICs.
    Note: In blade servers, the "Dedicated" option is displayed as Chassis (Dedicated).

- Shared LOM
    - o With Shared mode, iDRAC uses one of the embedded network ports (LOM) for iDRAC9 traffic.
    - o This option does not require an additional network cable or network port on the switch; however, the iDRAC9 still needs IP address information.
    - o This option is best for datacenters with limited availability of network ports on the switch.

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1.6 Quick Sync 2 (with OpenManage Mobile 2.0)

New for 14th generation PowerEdge servers, the optional Quick Sync 2 module provides wireless server management when used with the OpenManage Mobile (OMM) app for your compatible phone or tablet. Choose Quick Sync 2 module for secure server configuration, monitoring, and remediation. To use Quick Sync 2, first download (by using Google Play Store or Apple App Store), and then install OMM (version 2.0 or later) on your mobile device. You can then run OMM to access the server by using Quick Sync 2.

Quick Sync 2 utilizes both Bluetooth Low Energy (BLE) and Wi-Fi. OMM primarily connects to Quick Sync 2 over an encrypted BLE connection. Features that require higher bandwidth use encrypted Wi-Fi. An iDRAC administrator has the option to disable Wi-Fi or disable Quick Sync 2 completely. For more information and on how to manage servers from anywhere with an Android or iOS device, visit www.DellTechCenter.com/OMM.

Quick Sync 2 is an optional hardware piece that is located on the left "ear" of the server.

1.7　At the Server Management—LCD panel

Dell EMC continues to improve upon the variety of options you can use to manage servers "at the box" with or without connecting a traditional KVM. For those customers that have yet to adopt mobile solutions in the data center, the LCD panel will still be available as a means to configure IP addresses or view error codes.

Bezel: There are three bezel options for 14th generation PowerEdge servers:

- No Bezel
- Locking bezel — An optional metal bezel that is designed to protect against unauthorized access to drives. Comes with lock and key (shared across all locking bezels).

   Note: Locking bezel is not an option on the PowerEdge R940 server.

- LCD bezel — An optional, locking metal bezel with an integrated LCD screen. The screen can provide system and diagnostic information, and can also be used to configure iDRAC IP address settings. A single LCD bezel can be used across multiple servers of the same model (the bezel is stateless).
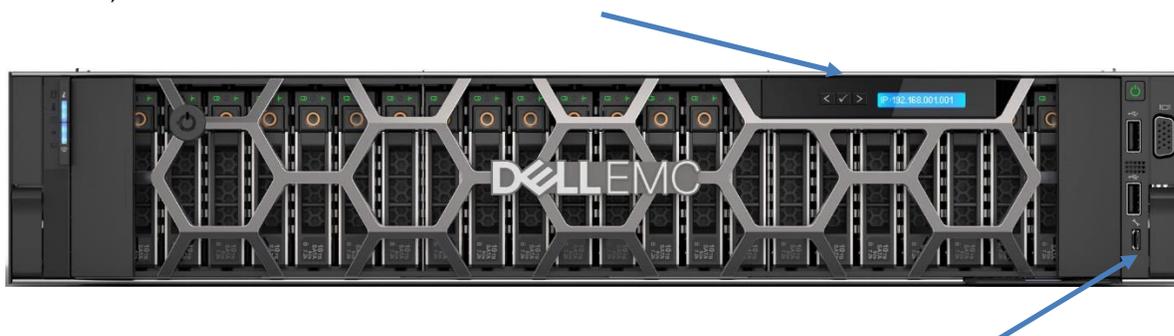
Note: An alternative means for "at the server" management is by using the iDRAC Direct Port which is located on the front of every 14th generation rack and tower server. For 14th generation, this is a Micro B USB port and identified by a "wrench" icon. This allows IT admins to connect a laptop or crash cart by using a standard USB to Micro B cable, eliminating the need to enter the 'hot aisle' and navigate to the correct port on the back of the server. For 14th generation, this port is 100% dedicated to the iDRAC, and as such, requires authentication prior to any information/actions.

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1.8   iDRAC Group Manager (requires iDRAC Enterprise license)

New for 14G iDRAC9—iDRAC Group Manager is a 'built in one-to-many console' that allows for all iDRAC9 versions to communicate to other iDRAC9 versions on the same physical IPv6 link local network. iDRAC versions will provide a global health status to the primary iDRAC9 of the Group.   This feature is enabled by default when the iDRAC9 Enterprise license is selected. Other key features include:

- No software to install (runs entirely on iDRAC)
- Auto-discovers and monitors other 14th generation servers
- Link and start other iDRAC9 graphical user interfaces (GUIs) or virtual consoles directly with Single Sign-on (SSO)
- Ideal for SMB customers who don't want to install and maintain a separate monitoring console
- iDRAC Group Manager can connect to 99 iDRAC9 sessions.
  - Group Manager— When enabled, allows for discovery by Group Manager.
  - Group Manager— When disabled, customers who do not want to use the Group Manager console must select this option. The top for pillars of the Dell EMC systems management closely align to the issues and business challenges facing many IT departments across the globe.

Conclusion

As you can see, there are many new options to consider when ordering a new 14th generation PowerEdge server. All of these options are designed to increase efficiency and/or security—providing IT professionals around the globe cost savings solutions.

Technical support and resources

- Dell.com/support is focused on meeting customer needs with proven services and support.
- Dell TechCenter is an online technical community where IT professionals have access to numerous resources for Dell EMC software, hardware, and services.
- DellTechCenter/iDRAC provides up to date links to firmware downloads, manuals, and white papers for iDRAC.

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A.1 Appendix A—iDRAC license-based feature comparison

Note: In this table, the text indicated in **black color boldface** implies that the feature is newly available in the 14th generation iDRAC application. Footnote descriptions are provided at the end of this table also.

Feature	iDRAC9 Basic	iDRAC9 Express	iDRAC9 Express for Blades	iDRAC9 Enterprise
	200-500 series Rack/Tower servers (standard)	200-500 Rack/Tower (upgrade option) 600+ Rack/Tower (standard) FX modules/ Precision Workstation	M1000e blades and VRTX modules only	All servers/Precision Workstation (upgrade option)
Interfaces / Standards				
Redfish	✓	✓	✓	✓
IPMI 2.0	✓	✓	✓	✓
DCMI 1.5	✓	✓	✓	✓
Web-based GUI	✓	✓	✓	✓
RACADM command line interface (CLI) (local/remote)	✓	✓	✓	✓
SMASH-CLP (SSH-only)	✓	✓	✓	✓
Telnet	✓	✓	✓	✓
SSH	✓	✓	✓	✓

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Feature	iDRAC9 Basic	iDRAC9 Express	iDRAC9 Express for Blades	iDRAC9 Enterprise
Serial Redirection	✓	✓	✓	✓
WSMAN	✓	✓	✓	✓
Network Time Protocol		✓	✓	✓
Connectivity				
Shared NIC	✓	✓	N/A	✓¹
Dedicated NIC²	✓	✓	✓	✓²
VLAN tagging	✓	✓	✓	✓
IPv4	✓	✓	✓	✓
IPv6	✓	✓	✓	✓
DHCP (new default; not static IP)	✓	✓	✓	✓
DHCP with Zero Touch				✓
Dynamic DNS	✓	✓	✓	✓
OS pass-through	✓	✓	✓	✓

[1] Not available with PowerEdge blade servers.
[2] 500 series and earlier versions of rack and tower servers require a hardware card to enable this feature. Hardware is offered at additional cost.

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Feature	iDRAC9 Basic	iDRAC9 Express	iDRAC9 Express for Blades	iDRAC9 Enterprise
iDRAC Direct - Front panel USB	✓	✓	✓	✓
Connection View	✓	✓	✓	✓
NFS v4	✓	✓	✓	✓
SMB3.0 with NTLMv1 and NTLMv2	✓	✓	✓	✓
Security				
Role-based authority	✓	✓	✓	✓
Local users	✓	✓	✓	✓
SSL encryption	✓	✓	✓	✓
IP blocking		✓	✓	✓
Directory services (AD, LDAP)				✓
Two-factor authentication				✓
Single sign-on				✓
PK authentication		✓	✓	✓
Secure UEFI boot - certificate management	✓	✓	✓	✓

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Feature	iDRAC9 Basic	iDRAC9 Express	iDRAC9 Express for Blades	iDRAC9 Enterprise
Lock down mode				✓
Unique iDRAC default password	✓	✓	✓	✓
FIPS 140-2	✓	✓	✓	✓
Customizable Security Policy Banner - login page	✓	✓	✓	✓
Quick Sync 2.0 - optional auth for read operations	✓	✓	✓	✓
Quick Sync 2.0 - add mobile device number to LCL	✓	✓	✓	✓
System Erase of internal storage devices	✓	✓	✓	✓
Remote Presence				
Power control	✓	✓	✓	✓
Boot control	✓	✓	✓	✓
Serial-over-LAN	✓	✓	✓	✓
Virtual Media			✓	✓
Virtual Folders				✓

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Feature	iDRAC9 Basic	iDRAC9 Express	iDRAC9 Express for Blades	iDRAC9 Enterprise
Remote File Share				✓
Virtual Console			✓	✓
HTML5 access to Virtual Console			✓	✓
VNC connection to OS				✓
Quality/bandwidth control				✓
Virtual Console collaboration (6 users)				✓
Virtual Console chat				✓
Virtual Flash partitions				✓[2,3]
Group Manager				✓
HTTP / HTTPS support along with NFS/CIFS	✓	✓	✓	✓
Power & Thermal				
Real-time power meter	✓	✓	✓	✓
Power thresholds & alerts		✓	✓	✓

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[3] Requires vFlash SD card media.

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Feature	iDRAC9 Basic	iDRAC9 Express	iDRAC9 Express for Blades	iDRAC9 Enterprise
Real-time power graphing		✓	✓	✓
Historical power counters		✓	✓	✓
Power capping				✓
Power Center integration				✓
Temperature monitoring	✓	✓	✓	✓
Temperature graphing		✓	✓	✓
Health Monitoring				
Full agent-free monitoring	✓	✓	✓	✓
Predictive failure monitoring	✓	✓	✓	✓
SNMPv1, v2, and v3 (traps and gets)	✓	✓	✓	✓
Email Alerting		✓	✓	✓
Configurable thresholds	✓	✓	✓	✓
Fan monitoring	✓	✓	✓	✓
Power Supply monitoring	✓	✓	✓	✓
Memory monitoring	✓	✓	✓	✓

Enhanced features in iDRAC9 by using different order options, and at-the-box Systems Management for 14th generation Dell EMC PowerEdge servers

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Feature	iDRAC9 Basic	iDRAC9 Express	iDRAC9 Express for Blades	iDRAC9 Enterprise
CPU monitoring	✔	✔	✔	✔
RAID monitoring	✔	✔	✔	✔
NIC monitoring	✔	✔	✔	✔
HD monitoring (enclosure)	✔	✔	✔	✔
Out of Band Performance Monitoring				✔
Alerts for excessive SSD wear	✔	✔	✔	✔
Customizable settings for Exhaust Temperature	✔	✔	✔	✔
Update				
Remote agent-free update	✔	✔	✔	✔
Embedded update tools	✔	✔	✔	✔
Sync with repository (scheduled updates)				✔
Auto-update				✔
Improved PSU firmware updates	✔	✔	✔	✔

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Feature	iDRAC9 Basic	iDRAC9 Express	iDRAC9 Express for Blades	iDRAC9 Enterprise
Deployment & Configuration				
Local configuration via F10	✓	✓	✓	✓
Embedded OS deployment tools	✓	✓	✓	✓
Embedded configuration tools	✓	✓	✓	✓
Auto-Discovery		✓	✓	✓
Remote OS deployment		✓	✓	✓
Embedded driver pack	✓	✓	✓	✓
Full configuration inventory	✓	✓	✓	✓
Inventory export	✓	✓	✓	✓
Remote configuration	✓	✓	✓	✓
Zero-touch configuration				✓
System Retire/Repurpose	✓	✓	✓	✓
Server Configuration Profile in GUI	✓	✓	✓	✓
Diagnostics, Service, & Logging				

Enhanced features in iDRAC9 by using different order options, and at-the-box Systems Management for 14th generation Dell EMC PowerEdge servers

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Feature	iDRAC9 Basic	iDRAC9 Express	iDRAC9 Express for Blades	iDRAC9 Enterprise
Embedded diagnostic tools	✓	✓	✓	✓
Part Replacement		✓	✓	✓
Server Configuration Backup				✓
Server Configuration Restore	✓	✓	✓	✓
Easy Restore (system configuration)	✓	✓	✓	✓
Easy Restore Auto Timeout	✓	✓	✓	✓
LED Health Status indicators	✓	✓	✓	✓
LCD Screen (requires optional bezel)	✓[5]	✓[5]	N/A	✓[5]
Quick Sync 2.0 (requires BLE/WiFi hardware)	✓	✓	**N/A**	✓
iDRAC Direct (front USB management port)	✓	✓	✓	✓
iDRAC Service Module (iSM) embedded	✓	✓	✓	✓
Alert forwarding via iSM to in-band monitoring consoles	✓	✓	✓	✓
Crash screen capture		✓	✓	✓

20   Enhanced features in iDRAC9 by using different order options, and at-the-box Systems Management for 14th generation Dell EMC PowerEdge servers

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Feature	iDRAC9 Basic	iDRAC9 Express	iDRAC9 Express for Blades	iDRAC9 Enterprise
Crash video capture [4]				✓
Boot capture				✓
Manual reset for iDRAC (LCD ID button)	✓	✓	✓	✓
Remote reset for iDRAC (requires iSM)	✓	✓	✓	✓
Virtual NMI	✓	✓	✓	✓
OS watchdog [4]	✓	✓	✓	✓
SupportAssist Report (embedded)	✓	✓	✓	✓
System Event Log	✓	✓	✓	✓
Lifecycle Log	✓	✓	✓	✓
Enhanced Logging in Lifecycle Controller Log	✓	✓	✓	✓
Work notes	✓	✓	✓	✓
Remote Syslog				✓

[4] Requires iDRAC Service Module (iSM) or OpenManage Server Administrator (OMSA)

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Feature	iDRAC9 Basic	iDRAC9 Express	iDRAC9 Express for Blades	iDRAC9 Enterprise
License management	✓	✓	✓	✓
Improved Customer Experience				
iDRAC -Faster processor, more memory	✓	✓	✓	✓
GUI rendered in HTML5	✓	✓	✓	✓
Add BIOS configuration to iDRAC GUI	✓	✓	✓	✓
iDRAC support for SW RAID licensing	✓	✓	✓	✓

1. Not available with blade servers.
2. 500 series and earlier versions of rack and tower servers require a hardware card to enable this feature. Hardware is offered at additional cost.
3. Requires vFlash SD card media.
4. Requires iDRAC Service Module (iSM) or OpenManage Server Administrator (OMSA).
5. Requires optional bezel.

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