

SIMPLIFYING SYSTEMS MANAGEMENT WITH DELL OPENMANAGE ON 13G DELL POWEREDGE SERVERS

SIMPLIFIED SYSTEMS MANAGEMENT

WITH DELL™ OPENMANAGE™ ON DELL 13G SERVERS



Dell PowerEdge™ servers powered by Intel® Xeon® processors E5-2600 v3 series

Faster deployment

Improved connectivity

Automated maintenance

Easier updating

All comparisons are to doing the same tasks with standard manual procedures.

A new generation of servers doesn't just provide new hardware to increase performance. New servers also deliver updated systems management features to help you streamline management tasks and reduce management costs.

In the Principled Technologies test labs, we tested the systems management enhancements in the new, 13th generation of Dell servers along with the newest versions of the Dell OpenManage suite, to see the time and steps that we could save by using the newer technologies.

We found that the new 13G Dell PowerEdge servers with OpenManage enabled easier deployment than the previous generation, using new Auto Configuration and OpenManage Essentials (OME) one-to-many features. We also explored multiple enhanced connectivity methods to the 13G integrated Dell Remote Access Controller (iDRAC) 8. Finally, we tested scenarios using the new version of OpenManage suite with 13G, which we found provided features that make updating easier.

With all these new features, Dell OpenManage with Dell 13G servers can help ease your datacenter's management burden, no matter the size of your infrastructure.



DELL OPENMANAGE SUITE AND DELL 13G

Dell OpenManage is a systems management suite designed to help IT departments of all sizes manage their Dell PowerEdge server infrastructures. Without automating management tasks, administrators must perform these tasks manually, including node deployment, error correction, and updates. The Dell OpenManage suite automates many processes, freeing up IT time for more strategic tasks. Using integrated systems management can improve the overall function of your infrastructure by allowing administrators to more quickly solve any problems that arise in the datacenter.

With the introduction of 13G Dell PowerEdge servers, Dell has added a number of features to Dell OpenManage systems management to save administrator time and increase management flexibility (see Figure 1).

| New systems management features in the Dell OpenManage Suite and iDRAC8 for 13G servers | | |
|---|---|---|
| Faster Deployment | “Zero-Touch” Auto Configuration | Deploy a baseline server configuration profile automatically as soon as the server is connected to the network. |
| | Open Manage Essentials (OME) One-to-many deployment | Perform automated hardware configuration and Operating System deployment to multiple servers through centralized management. |
| Improved Connectivity | iDRAC Direct (cable) | Connect directly to the iDRAC using a front side USB connection, without the need for a dedicated management network |
| | iDRAC Direct (key) | Rapidly deploy custom server profiles using plug and play technology. |
| | Quick Sync (NFC) | Quickly inventory and modify server configurations using smartphone and tablets. |
| Automated Maintenance | Tech Support Report | Gather complete, advanced diagnostic information from a single location. |
| | OME Managing Configuration Baseline | Manage your server configurations from a centralized location, without having to take a single server offline for inventory. |
| Easier updating | Zero Touch Repository Manager and Self-updating firmware system | Build self-maintaining repositories and configure servers to automatically update to new versions of software on your own schedule. |
| | OME Agent-free driver update | Deploy firmware and driver updates from the OME console without manage software on your servers. |

Figure 1: New features in Dell OpenManage.

To learn more about our test components, see [Appendix A](#). For a detailed look at the system we used for testing, see [Appendix B](#). For step-by-step details on how we tested, see [Appendix C](#).

WHAT WE FOUND

We investigated the new features of the Dell OpenManage Suite and the Dell 13G line on a new Dell PowerEdge R730 server to see how they simplified management tasks compared to doing them manually. These features fit into four categories:

- Deployment
- Connectivity
- Maintenance
- Updating

We found that the new features simplified all these tasks, saving administrator time and steps, as shown in Figure 2 shows.

| Scenario | Automation | | Manual | | Difference | | |
|---|------------|-------|----------|--------|---------------|-------------|-------------|
| | Time (s) | Steps | Time (s) | Steps | Less time (s) | % Less time | Fewer steps |
| Zero-Touch Auto Configuration | 0 | 0 | 859 | 213 | 859 | 100% | 213 |
| OME One-to-Many Auto Deployment (100 servers - extrapolated) | 95 | 23 | 125,400 | 22,200 | 125,305 | 99.92% | 22,177 |
| <i>One server</i> | 95 | 23 | 1,254 | 222 | 1,159 | 92% | 199 |
| iDRAC Direct (cable) | 76 | 12 | 181 | 27 | 105 | 58% | 15 |
| iDRAC Direct (USB key) | 28 | 4 | 859 | 213 | 831 | 97% | 209 |
| Quick Sync with OM Mobile App | 156 | 36 | 508 | 43 | 352 | 69% | 7 |
| <i>Quick Sync Read</i> | 39 | 12 | 248 | 18 | 209 | 84% | 6 |
| <i>Quick Sync Write</i> | 117 | 24 | 260 | 25 | 143 | 55% | 1 |
| Tech Support Report | 123 | 11 | 455 | 29 | 332 | 73% | 18 |
| OME Configuration Management (100 servers - extrapolated) | 50 | 5 | 57,300 | 7,400 | 57,250 | 99.91% | 7,395 |
| <i>One server</i> | 50 | 5 | 573 | 74 | 523 | 91% | 69 |
| Zero Touch Repository Management and Auto-Update Firmware | 0 | 0 | 306 | 20 | 306 | 100% | 20 |

Figure 2: Summary of our test results.

New features for deployment

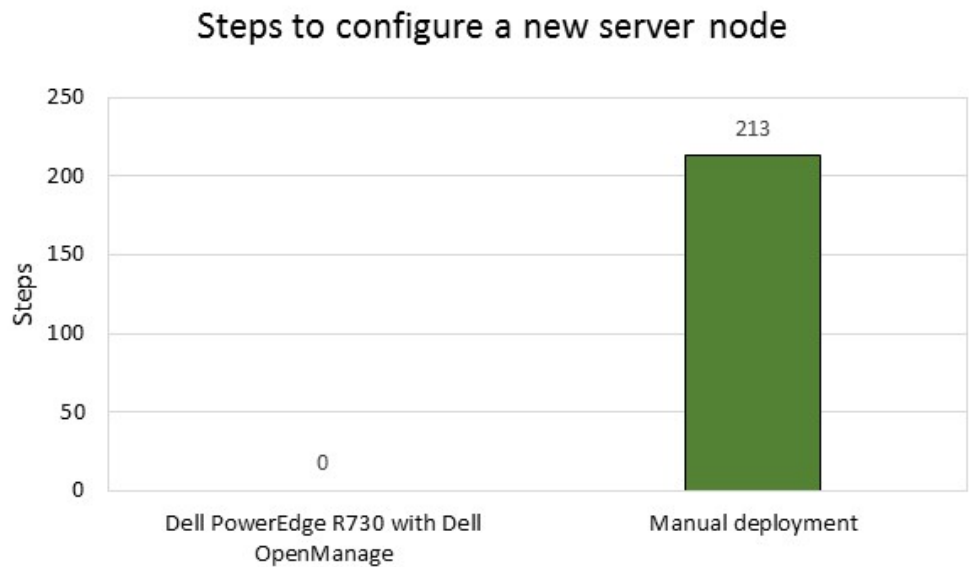
“Zero-Touch” Auto Configuration

Configuring new servers can be a time-consuming task, especially when IT staff has a number of servers to deploy, apply changes to, and get into production. Dell 13G servers can use “Zero-Touch” Auto Configuration, which automates the server profile application. With Auto Configuration, when a server is powered on and the iDRAC is connected and configured for DHCP (a factory option), the iDRAC obtains configuration profile information from the pre-configured DHCP server and automatically applies the

correct hardware settings, which reduces deployment time and eliminates potential user error.

In our hands-on tests, we used Auto Configuration to configure a Dell PowerEdge R730 server using a Server Configuration Profile, and then applied the same changes manually. As Figure 3 shows, using Dell Auto Configuration required no steps or time for administrators to configure a server with an automatically deployed server profile, while it took 213 steps and 14 minutes 19 seconds to do the same configuration tasks manually. If your organization is deploying one hundred servers at a time, Auto Configuration could save nearly three days of administrative time and eliminate 21,300 steps and potential human error. Administrators could use the time they save configuring servers to maintain and innovate elsewhere.

Figure 3: It took 213 fewer steps to configure a new server using Dell OpenManage with Zero-Touch auto-configuration than doing it manually.

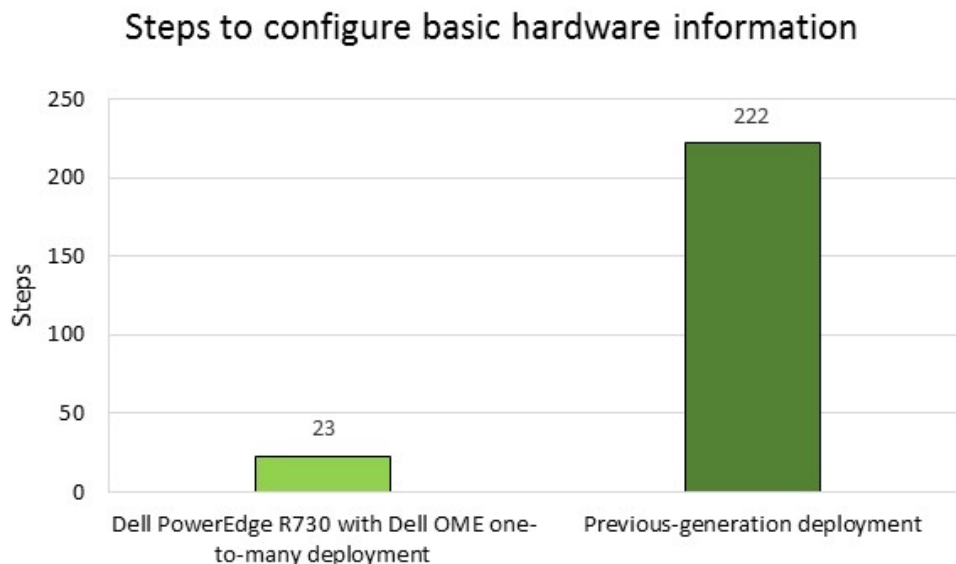


Dell OpenManage Essentials one-to-many deployment

Speeding up deployment server-by-server would certainly increase datacenter efficiency, but what if administrators could reduce the time it took to deploy organization-approved configurations *and* operating systems to whole racks at a time? With OpenManage Essentials one-to-many deployment, we were able to deploy configuration profiles and operating systems to a Dell PowerEdge R730 server in just 95 seconds, using just 23 steps. Doing the same task on an older Dell server with a Lifecycle Controller-guided deployment process was a much lengthier process.

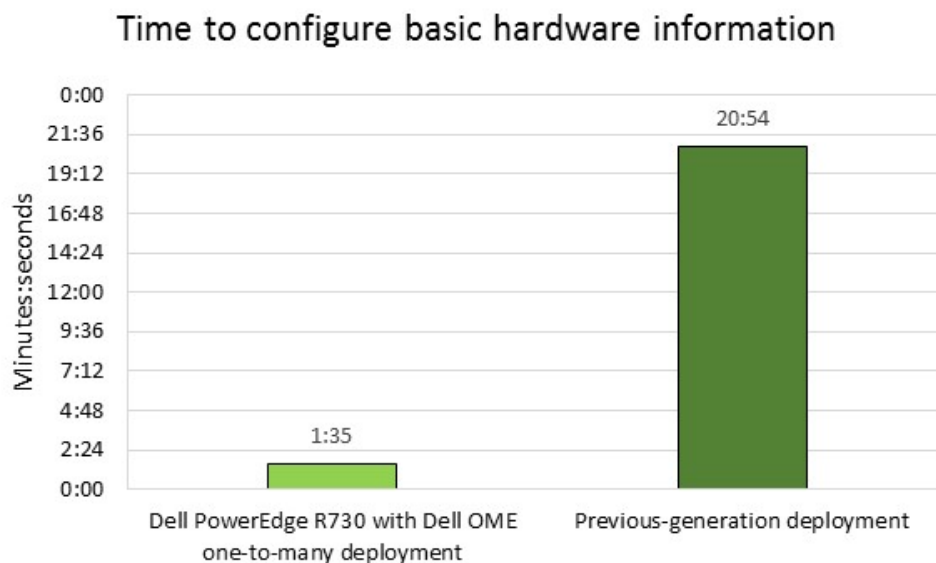
Figure 4 compares the number of steps it took to configure basic hardware information, including iDRAC IP, RAID, NIC, and more, and install and boot the Windows Server 2012 R2 operating system.

Figure 4: Configuring a single server using Dell OME one-to-many deployment took 199 fewer steps than the previous-generation solution.



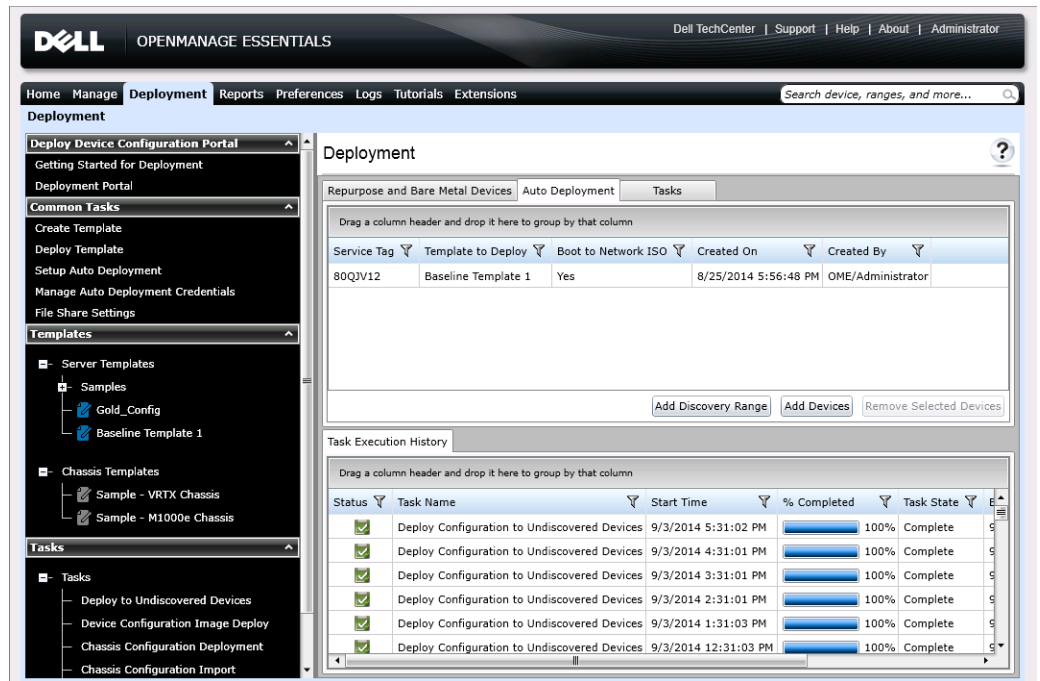
As Figure 5 shows, it took only 1 minute 35 seconds—92 percent less time to deploy the configuration to a single server using Dell OME one-to-many deployment compared to the previous-generation guided deployment.

Figure 5: Configuring a single server using Dell OME one-to-many deployment took 92 percent less time than the previous-generation solution.



The real benefit of Dell OME one-to-many deployment (see Figure 6) becomes clear when extrapolated to a large number of servers, which many infrastructures require. For example, deploying a configuration profile and operating system to 100 servers would save up to 22,177 repetitive administrative steps, and nearly 35 hours of administrative time, while guaranteeing consistency and eliminating human error from the deployment process.

Figure 6: Dell OpenManage Essentials enables automatic deployment of both server hardware profiles and operating systems to multiple targets simultaneously.



New features for connectivity

Some administrators still prefer to manage their servers while directly connected to their hardware. When something is wrong with a configuration or you need to make a quick change with minimal disruption to service, it is important that you can connect as quickly as possible. Dell OpenManage on Dell 13G servers provides features that let you connect directly to integrated Dell Remote Access Controller (iDRAC) and manage systems in a number of ways. With multiple paths to connect to the embedded management system, including iDRAC Direct (cable), iDRAC Direct (key), and Quick Sync (NFC), we found that administrators could save both steps and time to connect.

iDRAC Direct (cable)

We found that iDRAC Direct could eliminate the need for cumbersome “crash carts” and reduced the number of steps and time it took to make changes to a server configuration compared to the legacy method using KVM and manual setup (see Figures 7 and 8). Using the legacy method required connecting KVM hardware to the server, rebooting, and manually entering system setup at the boot screen. This procedure also takes the system out of service, which affects customers. With iDRAC Direct, the management network was immediately accessible; we simply had to plug in a USB cable and open a browser to directly connect to the iDRAC, where we were able to make array configuration changes.

Figure 7: Making configuration changes using iDRAC Direct (cable) required 15 fewer steps than using KVM and manual setup.

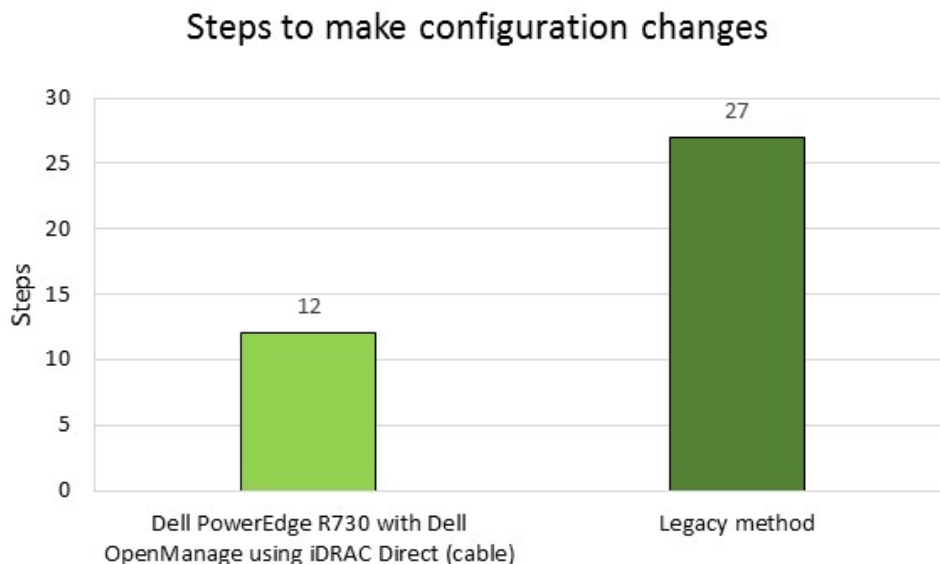
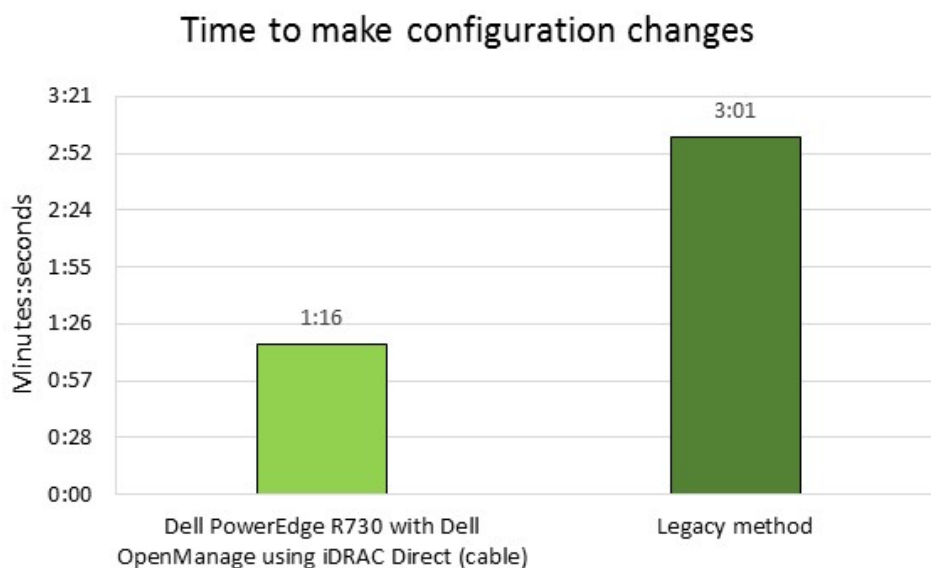


Figure 8: Changing the server configuration using iDRAC Direct (cable) required 58 percent less time than connecting using KVM and manual setup.



iDRAC Direct (key)

When you need to repurpose a server, it can be time consuming to reconfigure the server for optimal performance in its new role. Using iDRAC Direct (key), we were able to redeploy a server with a new hardware profile, without a time-consuming, manual process. We found that iDRAC Direct could detect a server profile stored on a USB key, and deploy the profile to the server in just four steps requiring only 28 seconds of an administrator's time – that's 209 fewer steps and 97 percent less time than manually reconfiguring a server. (See Figures 9 and 10.)

Figure 9: Connecting to iDRAC at the box using iDRAC Direct (key) required 209 fewer steps than deploying a server profile using KVM and manual setup.

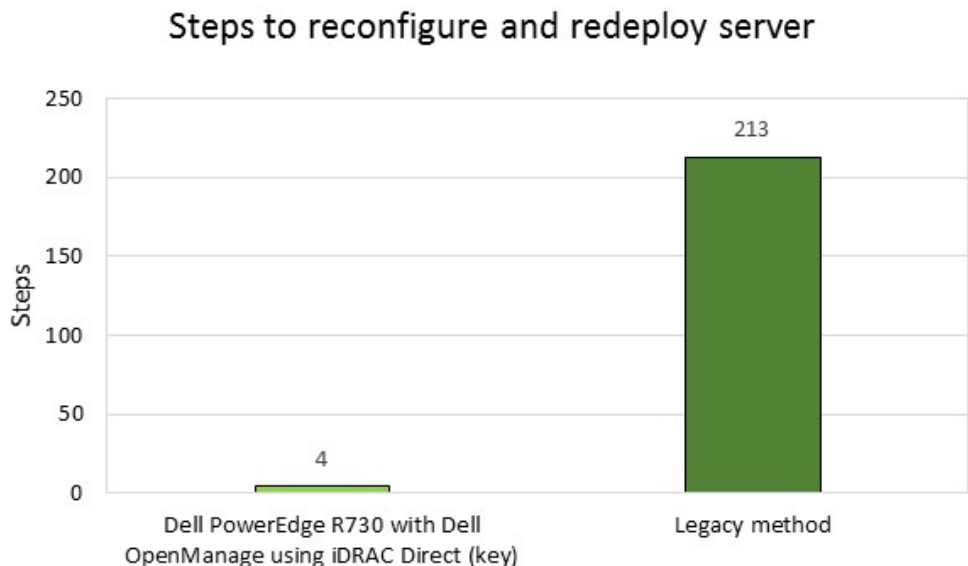
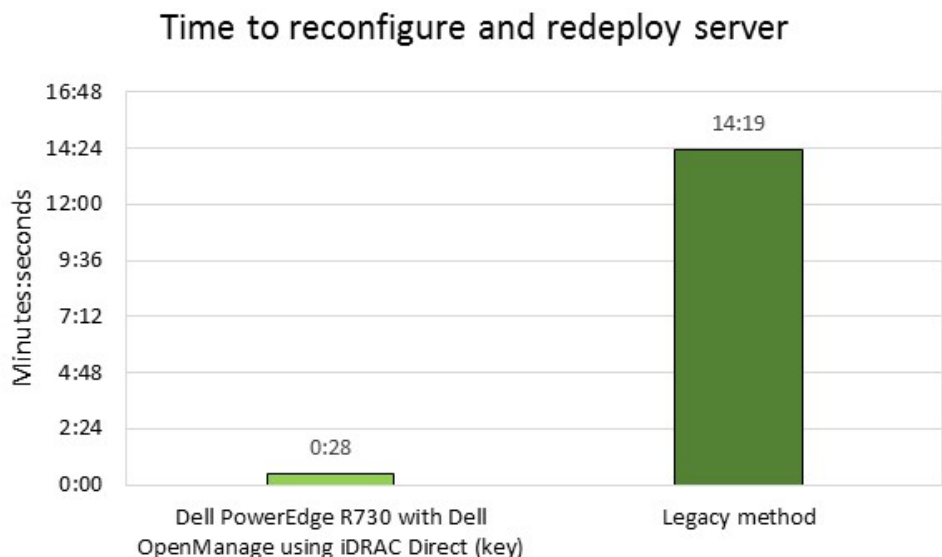


Figure 10: Connecting to iDRAC at the box using iDRAC Direct (key) required 97 percent less time than deploying a server profile using KVM and manual setup.



To prevent subsequent configuration changes on your server, you can configure the iDRAC to disable USB key deployment once the configuration is complete, and to prevent unauthorized reconfiguration without factory credentials. These safeguards prevent a new configuration from being written to a production server.

Quick Sync

As smartphones and tablets increasingly become tools of the trade for system administrators, the ability to manage systems from these devices can be a real advantage to admins who favor the portability of the smaller smart devices.

The 13G Dell PowerEdge servers contain, as part of their front bezels, a Near Field Communications (NFC) device. We installed the Dell OpenManage Mobile app on an NFC-enabled Android™ tablet, and used that device to perform basic inventory, health check, and system configuration tasks, which Figure 11 shows. Each time a system is synchronized, the configuration remains cached for later use, so administrators can quickly inventory an entire rack or row of servers, and then distill or manipulate the data once they return to their desks.

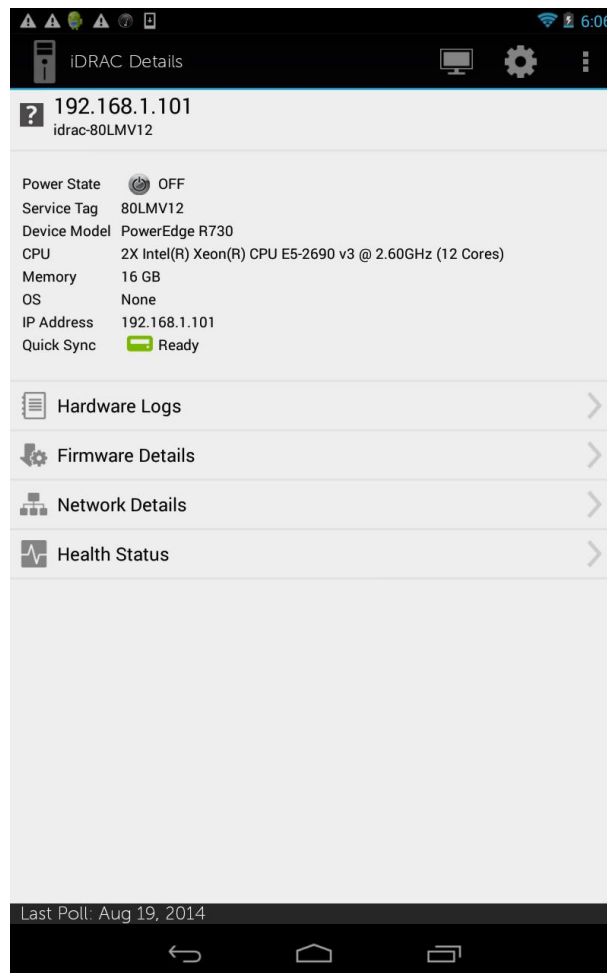
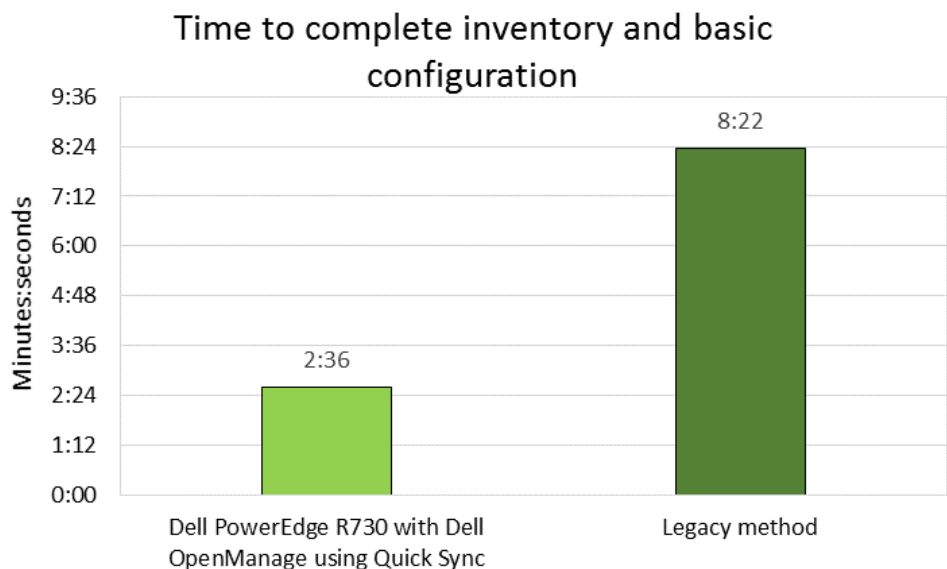


Figure 11: Dell OpenManage Mobile enables administrators to use NFC-enabled devices to manage the servers in their datacenters.

We found that Quick Sync was able to reduce manual inventory and iDRAC configuration times by a combined 69 percent (see Figure 12), saving seven steps per server compared to manual methods for previous-generation servers. We found that with Dell OpenManage and the 13G Dell PowerEdge R730, we were able to complete faster inventory and hardware identification. QuickSync from our NFC-enabled tablet provided easier navigation than using the on-system LCD panel and accompanying front panel buttons.

Figure 12: Completing inventory and basic configuration using Quick Sync required 69 percent less time than manually inventorying the system and using the LCD screen for basic iDRAC setup.



New features to improve maintenance

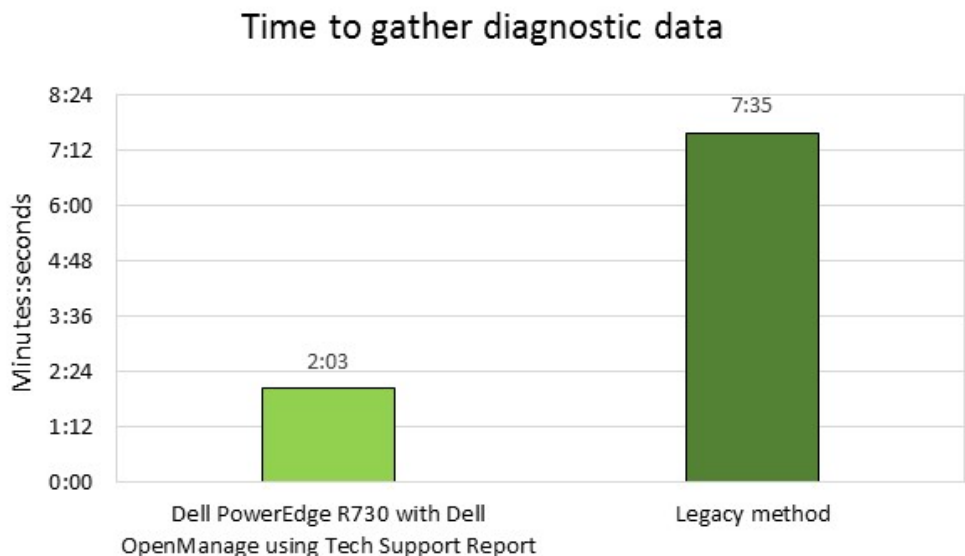
Dell OpenManage also introduces new maintenance and problem-solving features for 13G server. The quicker your administrators can solve problems, the higher the availability of your infrastructure so that business can keep moving.

Tech Support Report

Simplifying support calls is a great way to reduce administrative effort while ensuring that problems are handle more efficiently to keep your workloads running. We found that in 13G servers with iDRAC8, we could generate a complete Tech Support Report (TSR) that included Operating System diagnostic information. The iDRAC 8 leverages the Dell iDRAC Service Module, a lightweight software component that installs in a host operating system, to obtain diagnostic data from the OS. It is no longer necessary to execute a separate data collection program within the operating system when trying to troubleshoot issues – the single iDRAC-generated TSR already contains that information.

We found that this simplified information gathering mechanism required 73 percent less time than a process where Dell Server E-support Tool or DSET is downloaded and executed on the host operating system (see Figure 13). The 13G version of the TSR simplifies support calls by reducing the variety of data that has to be collected.

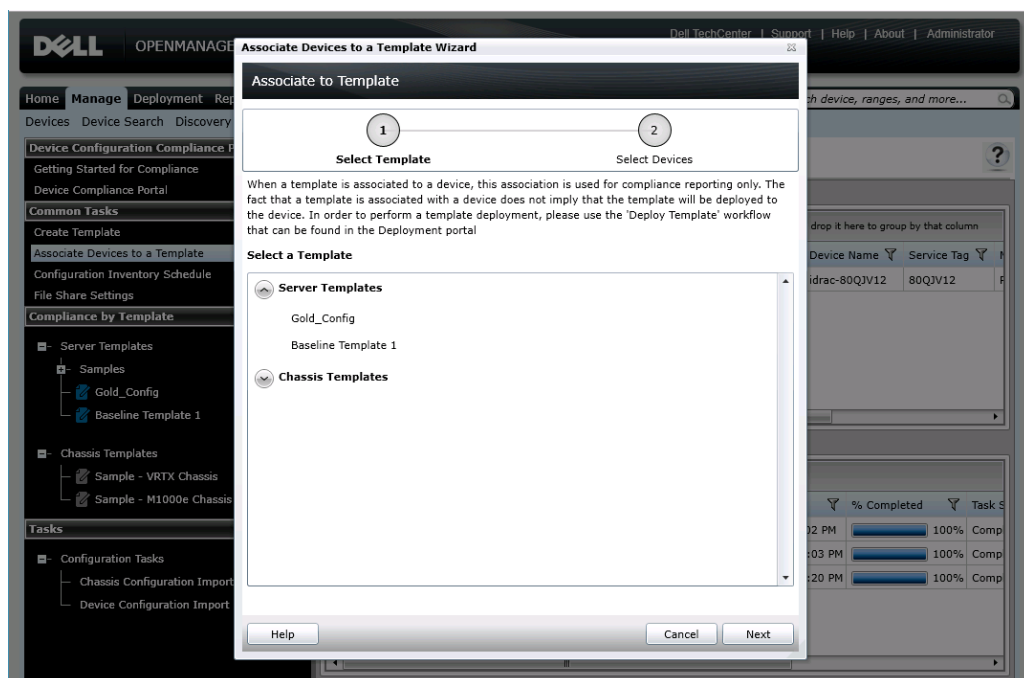
Figure 13: iDRAC8 with Tech Support Report reduced the time it took to gather diagnostic data by 73 percent.



OME Managing Configuration Baseline

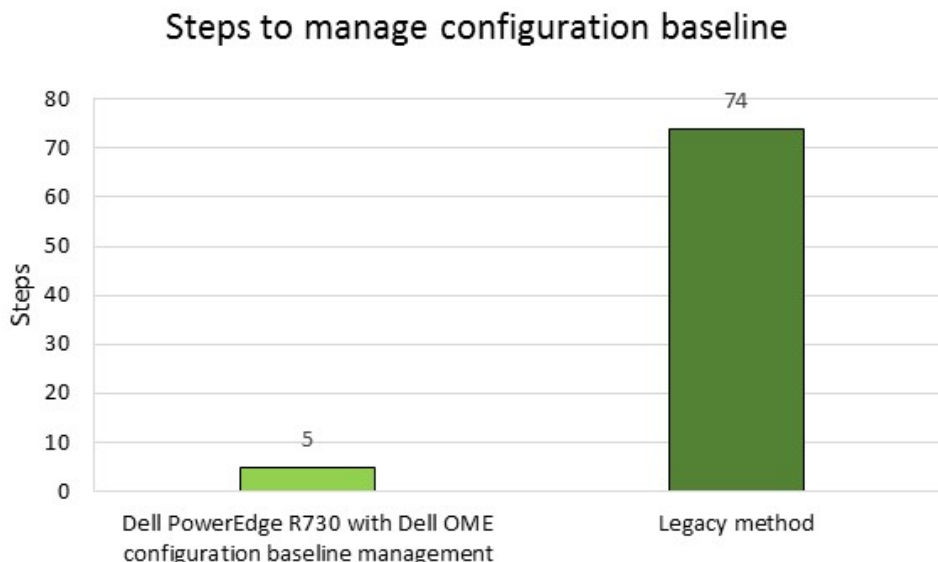
A major advantage of using server profiles is the ability to consistently configure servers for optimal performance in their intended role. Sometimes, in the course of ongoing operations, changes are made to server configurations. These changes may gradually introduce inconsistencies that degrade performance or affect IT standards. Manually inventorying a server to validate its configuration means taking the server out of operation, and deploying a configuration profile to servers that are already in use may have unforeseen consequences. With Dell OpenManage Essentials (OME), an administrator can create baseline configurations that contain all the settings a particular group of servers should use, and then associate servers with those configurations, as Figure 14 shows. OME can then perform regular, non-disruptive inventory on its managed servers, and allow administrators to easily find servers that have configuration drift and determine whether mitigation is necessary.

Figure 14: Dell OME allows administrators to assign servers to configuration templates to quickly monitor compliance.



In our tests, we determined OME configuration baseline management reduced administrative effort by 69 steps (see Figure 15), and required 91 percent less time than manually inventorying a single server. Because multiple servers can be applied to a given baseline, administrators can quickly determine which and how many servers deviate from a preferred profile. For example, OME can determine baseline configuration drift for 100 servers in the same number of steps and time required for a single server. This results in 7,395 fewer steps, and 99.91 percent less time than performing the same checks using manual methods for 100 servers. That's a savings of 15 hours, 54 minutes, 10 seconds administrator time that could be spent doing high-value work.

Figure 15: Dell OME reduced manual steps to manage configuration baseline to a Dell PowerEdge R730 server by 69 steps.



New features to simplify updating

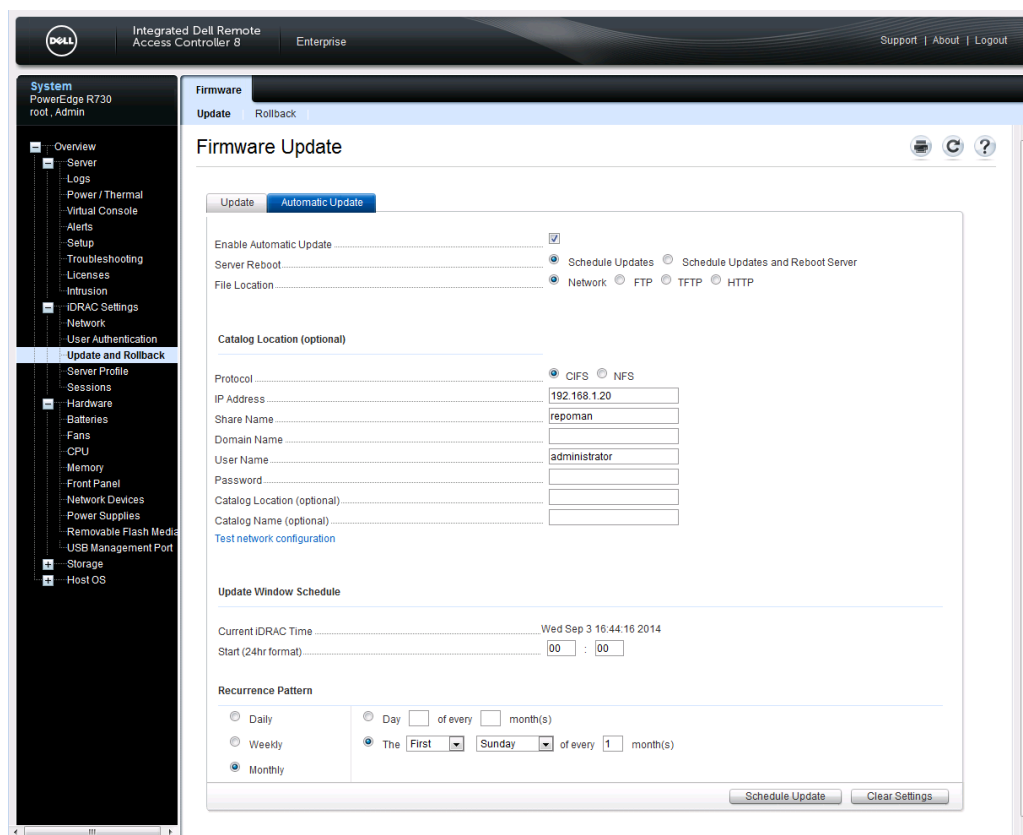
A major, time consuming responsibility administrators handle is ongoing updates of both firmware and drivers for their supported systems. The Dell OpenManage suite provides enhanced automation features specifically for dealing with these tasks. This frees up administrators so they can execute higher-value efforts in the datacenter.

Auto-Updating Firmware

To minimize impact to customers, pre-planned maintenance windows generally occur at times of off-peak usage, typically during the late night and early morning hours. This means administrators must either extend their working hours or shift their schedules, creating the possibility of support issues due to resource availability during higher activity periods.

13G Dell PowerEdge servers with iDRAC 8 have the ability to auto-update their firmware, allowing administrators to define network-based repositories as the sources of the updates and configure updates to occur during a specified period of time, without direct interaction (see Figure 16). When coupled with the Zero-Touch Repository Management features of Dell Repository Manager, the ability to perform updates automatically during off hours means an administrator can pre-stage maintenance activities during normal business hours. This allows administrators to tightly manage the types of updates a server will execute and remain available during peak times to address customer issues – all while reducing the server administration burden on the staff.

Figure 16: Dell 13G iDRAC 8 gives administrators the flexibility to schedule automated updates to fit their organization's needs.



In our tests, using Auto-Updating with Zero-Touch Repository manager saved 20 repetitive steps and 5 minutes, 6 seconds per server (see Figure 17). In organizations with multiple servers, this can be a substantial reduction in administrative effort. Updating just 10 servers manually during an over-night maintenance window would require a full hour of administrator time. Updating 100 servers would mean spanning multiple maintenance windows, and operating for at least one business day with some servers on one firmware revision, and some servers with another – a situation ripe for inconsistencies that could affect performance.

Time to complete firmware updates

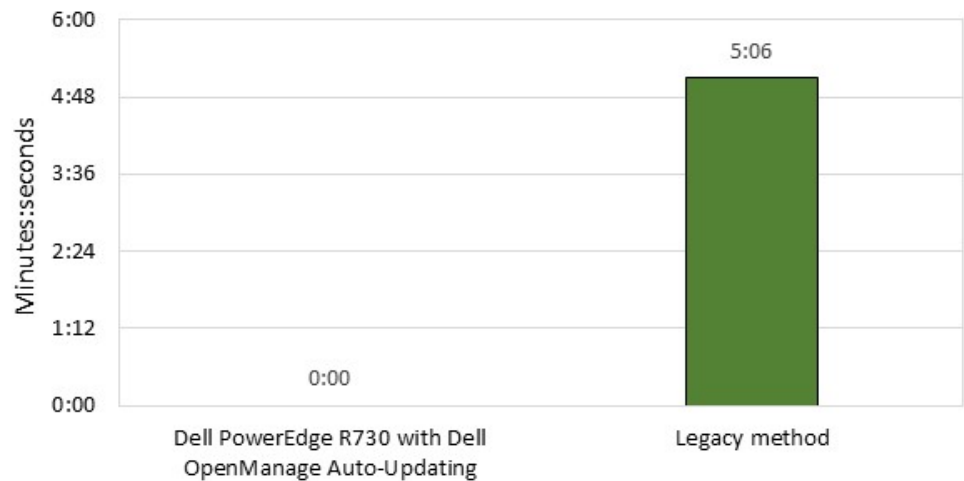


Figure 17: Updating firmware using automatic updating reduced administrative effort by 5 minutes 6 seconds per server compared to manual methods.

Agent-free OME driver updates

Dell OpenManage Essentials (see Figure 18) now has the ability to do agent-free inventory and firmware and driver updates on managed systems. By using this feature of Dell OME, an administrator doesn't have to worry about having agents or management applications installed on the host OS, which means less software to maintain.

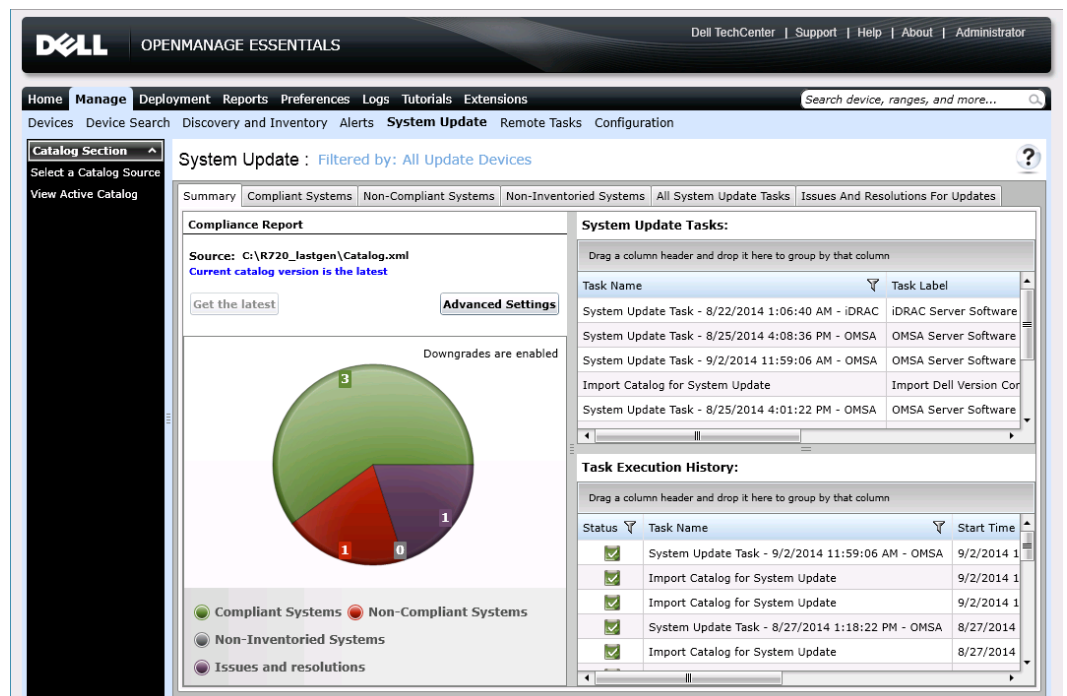


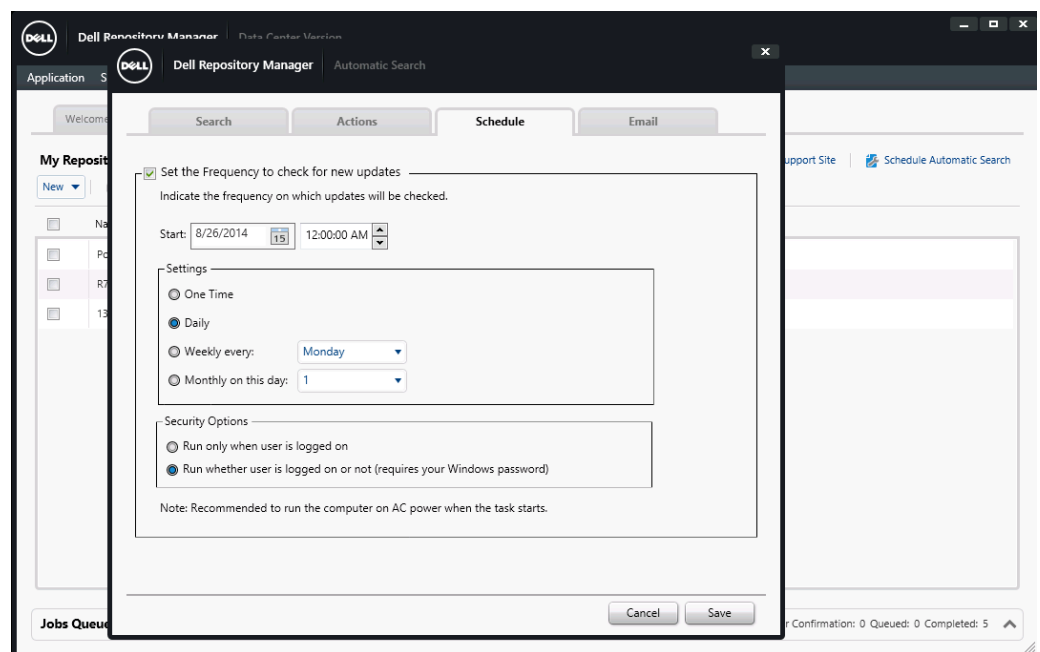
Figure 18: OpenManage Essentials can perform centrally managed, agentless driver and firmware updates to managed systems.

Zero-Touch Repository Management

Dell Repository Manager allows administrators to define custom repositories containing drivers and firmware updates. Many organizations have a vigorous vetting process to ensure that new firmware or drivers don't introduce unforeseen changes into their environment that can affect production servers.

With the latest versions of Dell Repository Manager, an administrator can create repositories that automatically update their contents when updates are available. This means the administrator always has the latest revisions available for testing, and can release those updates based on their organization's pre-planned maintenance cycle. (See Figure 19.)

Figure 19: Dell Repository Manager allows administrators to establish automatically updated repositories.



CONCLUSION

Automated systems management and additional connectivity solutions can reduce the number of administrators you need to run your datacenter or simply free up administrators to innovate rather than tying them up with routine management tasks. We found that the Dell OpenManage suite provides several new features for 13G Dell PowerEdge server solutions to streamline management tasks in both time and steps. Other new features let us easily connect to iDRAC right from the server. Updating firmware with Dell OpenManage features was also easier—eliminating 213 steps for updating a single server compared to updating manually.

The latest versions of the Dell OpenManage suite of system management tools and the power of iDRAC 8 contained within Dell 13G servers gives administrators

increased flexibility and powerful new options for managing their data centers that translate to demonstrable savings in time and administrative effort. These automated enhancements and new technologies enable administrators to manage increasingly larger workloads while reducing the amount of hands-on work required for each system, bringing real value to systems management and datacenter operations.

APPENDIX A – ABOUT THE COMPONENTS

About the Dell PowerEdge R730

The 2U Dell PowerEdge R730 rack server is powered by two Intel Xeon Haswell processors and is designed for functional flexibility in the datacenter. The PowerEdge R730 has 24 DIMM slots to support up to 1.5 TB of memory, supports up to two optional internal GPU processing accelerators, and can support up to four optional NVMe Express Flash PCIe SSDs to reduce storage bottlenecks.

With redundant power supply units, hot-swappable hardware, and Dual SD card for Failsafe Hypervisors, the Dell PowerEdge R730 supports hardware high availability. The PowerEdge R730 comes standard with iDRAC7 with Lifecycle Controller and Dell OpenManage, which all work to streamline management. For more details on the Dell PowerEdge R730, visit www.dell.com/us/business/p/poweredge-r730/pd.

APPENDIX B – SYSTEM CONFIGURATION INFORMATION

Figure 20 provides detailed configuration information for the test system.

| System | Dell PowerEdge R730 |
|-------------------------------------|--|
| Platform | |
| Vendor and model number | Dell PowerEdge R730 |
| BIOS name and version | 1.0.2 |
| General | |
| Number of processor packages | 2 |
| Number of cores per processor | 12 |
| Number of hardware threads per core | 2 |
| CPU | |
| Vendor | Intel |
| Name | Xeon |
| Model number | E5-2690 v3 |
| Socket type | Socket 2011-3 / R3 / LGA2011-3 |
| Core frequency (GHz) | 2.6 |
| Bus frequency | 5 GT/s DMI |
| L1 cache | 12 x 32 KB |
| L2 cache | 12 x 256 KB |
| L3 cache | 30 MB |
| Memory module(s) | |
| Total RAM in system (GB) | 16 |
| Vendor and model number | Hynix Semiconductor HMA41GR7MFR8N-TF |
| Type | DDR4 |
| Speed (MHz) | 2,133 |
| Speed running in the system (MHz) | 2,133 |
| Size (GB) | 8 |
| Number of RAM module(s) | 2 |
| Chip organization | Dual-sided |
| Rank | Dual |
| Operating system | |
| Name | Microsoft Windows Server 2012 R2, Datacenter x64 Edition |
| Build number | Version 6.3 (Build 9600) (x64) |
| File system | NTSF |
| Language | English |
| RAID controller | |
| Vendor and model number | Dell PERC H730P Mini |
| Firmware version | 25.2.1.0037 |
| Driver version | 6.602.07.00 |
| Cache size (MB) | 2,048 |

| System | Dell PowerEdge R730 |
|--------------------------|----------------------------|
| Hard drives | |
| Vendor and model number | Seagate ST300MM0006 |
| Number of drives | 5 |
| Size (GB) | 278.88 |
| RPM | 10,000 |
| Type | SAS |
| Power supplies | |
| Total number | 2 |
| Vendor and model number | Dell 0G6W6KX02 |
| Wattage of each (W) | 750 |
| Cooling fans | |
| Total number | 6 |
| Ethernet adapters | |
| Vendor and model number | Intel 2P X520/2P I350 rNDC |

Figure 20: System configuration information for the test system.

APPENDIX C – HOW WE TESTED

New features for deployment

Deploying a server with configured profile

Zero-Touch Auto Configuration

This task required no repetitive steps.

Deploying a Manual Configuration

1. Open a Web browser from within the management network and navigate to the iDRAC IP address (192.168.1.101).
2. Log in with the iDRAC's username and password (Username: root; Password: calvin).
3. Look at the Virtual Console Preview to see if the server is powered on. If there is no image, power on the server using the task under Quick Launch Tasks.
4. Select Alerts from the vertical navigation bar.
5. Select the SNMP and Email Settings tab from the horizontal navigation bar.
6. Check the State radio box for Alert Destination1 and type the destination IP address (192.168.1.50).
7. Verify that the Community String field is set to public.
8. Click Apply.
9. Change SNMP Trap Format to SNMP v2.
10. Click Apply.
11. Check the first State radio box for Destination Email Address and type the destination email address for Email Alert 1 (adminpager@principledtechnologies.com).
12. Click Apply.
13. In the SMTP (Email) Server IP Address or FQDN / DNS Name field, type the fully qualified domain name for the email server (mailer.principledtechnologies.com).
14. Click Apply.
15. Select the Alerts tab from the horizontal navigation bar.
16. Change Alerts to Enabled.
17. Click Apply.
18. Under Email, check the Amperage, Auto Sys Reset, and Battery Event critical alerts. Uncheck any non-critical alerts in this category.
19. Check the topmost radio box for SNMP Trap to check all radio boxes.
20. Check the topmost radio box for IPMI Alert to check all radio boxes.
21. Check the topmost radio box for Remote System Log to check all radio boxes.
22. Check the topmost radio box for WS Eventing to check all radio boxes.
23. Check the topmost radio box for OS Log to check all radio boxes.
24. Click the right arrow to navigate to the next page.
25. Under Email, check the Processor, Proc Absent, and Fan Event critical alerts. Uncheck any non-critical alerts in this category.
26. Check the topmost radio box for SNMP Trap to check all radio boxes.
27. Check the topmost radio box for IPMI Alert to check all radio boxes.
28. Check the topmost radio box for Remote System Log to check all radio boxes.
29. Check the topmost radio box for WS Eventing to check all radio boxes.
30. Check the topmost radio box for OS Log to check all radio boxes.
31. Click the right arrow to navigate to the next page.
32. Under Email, check the Hardware Config and Memory critical alerts. Uncheck any non-critical alerts in this category.
33. Check the topmost radio box for SNMP Trap to check all radio boxes.

34. Check the topmost radio box for Remote System Log to check all radio boxes.
35. Check the topmost radio box for WS Eventing to check all radio boxes.
36. Check the topmost radio box for OS Log to check all radio boxes.
37. Click the right arrow to navigate to the next page.
38. Under Email, check the OS Event, PCI Device, and Physical Disk critical alerts. Uncheck any non-critical alerts in this category.
39. Check the topmost radio box for SNMP Trap to check all radio boxes.
40. Check the topmost radio box for IPMI Alert to check all radio boxes.
41. Check the topmost radio box for Remote System Log to check all radio boxes.
42. Check the topmost radio box for WS Eventing to check all radio boxes.
43. Check the topmost radio box for OS Log to check all radio boxes.
44. Click the right arrow to navigate to the next page.
45. Under Email, check the BIOS POST, Power Supply, PSU Absent, and Power Usage critical alerts. Uncheck any non-critical alerts in this category.
46. Check the topmost radio box for SNMP Trap to check all radio boxes.
47. Check the topmost radio box for IPMI Alert to check all radio boxes.
48. Check the topmost radio box for Remote System Log to check all radio boxes.
49. Check the topmost radio box for WS Eventing to check all radio boxes.
50. Check the topmost radio box for OS Log to check all radio boxes.
51. Click the right arrow to navigate to the next page.
52. Under Email, check the critical alerts for Redundancy, IDSDM Media, and IDSDM Absent. Uncheck any non-critical alerts in this category.
53. Check the topmost radio box for SNMP Trap to check all radio boxes.
54. Check the topmost radio box for IPMI Alert to check all radio boxes.
55. Check the topmost radio box for Remote System Log to check all radio boxes.
56. Check the topmost radio box for WS Eventing to check all radio boxes.
57. Check the topmost radio box for OS Log to check all radio boxes.
58. Click the right arrow to navigate to the next page.
59. Under Email, check the IDSDM Redundancy, Security Event, and Sys Event Log critical alerts. Uncheck any non-critical alerts in this category.
60. Check the topmost radio box for SNMP Trap to check all radio boxes.
61. Check the topmost radio box for IPMI Alert to check all radio boxes.
62. Check the topmost radio box for Remote System Log to check all radio boxes.
63. Check the topmost radio box for WS Eventing to check all radio boxes.
64. Check the topmost radio box for OS Log to check all radio boxes.
65. Click the right arrow to navigate to the next page.
66. Under Email, check the Software Config, Temperature, and Temperature Statistics critical alerts. Uncheck any non-critical alerts in this category.
67. Check the topmost radio box for SNMP Trap to check all radio boxes.
68. Check the topmost radio box for IPMI Alert to check all radio boxes.
69. Check the topmost radio box for Remote System Log to check all radio boxes.
70. Check the topmost radio box for WS Eventing to check all radio boxes.
71. Check the topmost radio box for OS Log to check all radio boxes.
72. Click the right arrow to navigate to the next page.
73. Under Email, check the vFlash Event and Voltage critical alerts. Uncheck any non-critical alerts in this category.
74. Check the topmost radio box for SNMP Trap to check all radio boxes.
75. Check the topmost radio box for IPMI Alert to check all radio boxes.
76. Check the topmost radio box for Remote System Log to check all radio boxes.

77. Check the topmost radio box for WS Eventing to check all radio boxes.
78. Check the topmost radio box for OS Log to check all radio boxes.
79. Click the right arrow to navigate to the next page.
80. Under Email, check the Battery Event, Storage Contr, and Storage Enclosr critical alerts. Uncheck any non-critical alerts in this category.
81. Check the topmost radio box for SNMP Trap to check all radio boxes.
82. Check the topmost radio box for Remote System Log to check all radio boxes.
83. Check the topmost radio box for WS Eventing to check all radio boxes.
84. Check the topmost radio box for OS Log to check all radio boxes.
85. Click the right arrow to navigate to the next page.
86. Under Email, check the Fan Event, Physical Disk, and Power Supply critical alerts. Uncheck any non-critical alerts in this category.
87. Check the topmost radio box for SNMP Trap to check all radio boxes.
88. Check the topmost radio box for Remote System Log to check all radio boxes.
89. Check the topmost radio box for WS Eventing to check all radio boxes.
90. Check the topmost radio box for OS Log to check all radio boxes.
91. Click the right arrow to navigate to the next page.
92. Under Email, check the Temperature and Virtual Disk critical alerts. Uncheck any non-critical alerts in this category.
93. Check the topmost radio box for SNMP Trap to check all radio boxes.
94. Check the topmost radio box for Remote System Log to check all radio boxes.
95. Check the topmost radio box for WS Eventing to check all radio boxes.
96. Check the topmost radio box for OS Log to check all radio boxes.
97. Click the right arrow to navigate to the next page.
98. Under Email, uncheck any non-critical alerts in this category.
99. Check the topmost radio box for SNMP Trap to check all radio boxes.
100. Check the topmost radio box for Remote System Log to check all radio boxes.
101. Check the topmost radio box for WS Eventing to check all radio boxes.
102. Check the topmost radio box for OS Log to check all radio boxes.
103. Click the right arrow to navigate to the next page.
104. Under Email, check the Licensing critical alert. Uncheck any non-critical alerts in this category.
105. Check the topmost radio box for SNMP Trap to check all radio boxes.
106. Check the topmost radio box for IPMI Alert to check all radio boxes.
107. Check the topmost radio box for Remote System Log to check all radio boxes.
108. Check the topmost radio box for WS Eventing to check all radio boxes.
109. Check the topmost radio box for OS Log to check all radio boxes.
110. Click the right arrow to navigate to the next page.
111. Under Email, uncheck any non-critical alerts in this category.
112. Check the topmost radio box for SNMP Trap to check all radio boxes.
113. Check the topmost radio box for Remote System Log to check all radio boxes.
114. Check the topmost radio box for WS Eventing to check all radio boxes.
115. Check the topmost radio box for OS Log to check all radio boxes.
116. Click Apply.
117. Click Virtual Console in the vertical navigation bar.
118. Click Launch Virtual Console.
119. A Java app will launch. Click Continue when the security warning appears.
120. Click Run when the Java warning appears.
121. Click Run when the second security warning appears. The remote console viewer will launch.

122. Assuming no boot devices are installed, strike **F2** to enter System Setup and launch the System Setup menu.
123. At the System Setup Main Menu, select System BIOS.
124. Select Processor Settings.
125. Verify QPI Speed is set to Maximum data rate.
126. Verify that Virtualization Technology is Enabled.
127. Verify that Adjacent Cache Line Prefetch is Enabled.
128. Verify that Hardware Prefetcher is Enabled.
129. Verify that DCU Streamer Prefetcher is Enabled.
130. Verify that DCU IP Prefetcher is Enabled.
131. Verify that Execute Disable is Enabled.
132. Scroll down to verify that Number of Cores per Processor is set to 10. (Default: All)
133. Click the Back button.
134. Select SATA Settings.
135. Verify that Embedded SATA is set to AHCI Mode.
136. Click the Back button.
137. Select Boot Settings.
138. Verify that Boot Sequence Retry is Enabled.
139. Click the Back button.
140. Select Integrated Devices.
141. Verify that Embedded Video Controller is Enabled.
142. Scroll down to verify that OS Watchdog Timer is Disabled.
143. Click the Back button.
144. Select Serial Communication.
145. Verify that Serial Communication is Auto.
146. Verify that Serial Port Address is configured as follows: Serial Device1=COM1, Serial Device2=COM2. (Default: Serial Device1=COM2, Serial Device2=COM1)
147. Verify that External Serial Connector is set to Serial Device 1.
148. Verify that Failsafe Baud Rate is set to 115200.
149. Verify that Remote Terminal Type is set to ANSI. (Default: VT100/VT220)
150. Click the Back button.
151. Select System Profile Settings.
152. Verify that System Profile is set to Custom. (Default: Performance)
153. Verify that CPU Power Management is set to OS DBPM. (Default: Maximum Performance)
154. Verify that Turbo Boost is Enabled.
155. Verify that C1E is Enabled. (Default: Disabled)
156. Verify that Memory Frequency is set to Maximum Performance.
157. Verify that C States is Enabled. (Default: Disabled)
158. Verify that Memory Patrol Scrub is Disabled. (Default: Standard)
159. Scroll down to verify that Collaborative CPU Performance Control is Disabled.
160. Verify that Energy Efficient Policy is set to Balanced Performance. (Default: Performance)
161. Click the Back button.
162. Select System Security.
163. Verify that NMI Button is Disabled.
164. Click the Back button.
165. Scroll down to select Miscellaneous Settings.
166. Verify that F1/F2 Prompt on Error is Disabled. (Default: Enabled)
167. Verify that Load Legacy Video Option ROM is Enabled. (Default: Disabled)
168. Click the Back button.

169. Click the Finish button.
170. A warning dialog will appear. Click the Yes button.
171. A second dialog will appear alerting the user that the settings were saved successfully. Click the OK button.
172. At the System Setup Main Menu, select Device Settings.
173. Select Integrated RAID Controller 1.
174. Click Configuration Management.
175. Click Create Virtual Disk.
176. Set RAID Level to RAID5.
177. Select Select Physical Disks.
178. Select Check All to select all unconfigured disks.
179. Scroll down to click Apply Changes.
180. Click OK.
181. Scroll down, and change Default Initialization to Fast.
182. Select Create Virtual Disk.
183. Check Confirm, and click Yes.
184. Click OK.
185. Click the Back button.
186. Click the Back button again.
187. Click Finish.
188. At the Device Settings menu, select the Integrated NIC 1 Port 1.
189. Click NIC Configuration.
190. Verify that Legacy Boot Protocol is set to None. (Default: PXE)
191. Click Back.
192. Click Finish.
193. Click Yes, and click OK.
194. At the Device Settings menu, select the Integrated NIC 1 Port 2.
195. Click NIC Configuration.
196. Verify that legacy boot protocol is set to None.
197. Click the Back button.
198. Click the Finish button.
199. Click the Finish button again.
200. At the System Setup Main Menu, select iDRAC Settings.
201. Select Network.
202. Scroll down to the IPMI Settings category and set Enable IPMI Over LAN to Enabled. (Default: Disabled)
203. Click the Back button.
204. Select Alerts.
205. Verify that Enable Platform Event Filter Alerts is Enabled.
206. Verify that Enable Alert Destination 1 is Enabled.
207. Verify that Alert Destination 1 is set to 192.168.1.50.
208. Click the Back button.
209. Click the Finish button.
210. A warning dialog will appear alerting the user Settings have changed, and prompting the user Do you want to save the changes? Click the Yes button.
211. A second dialog will appear alerting the user that the settings were saved successfully. Click the OK button.
212. At the System Setup Main Menu, click the Finish button to apply all changes and reboot.
213. A warning dialog will appear confirming the exit command and prompting the user Are you sure you want to exit and reboot? Click the Yes button to reboot.

One-to-many deployment

Manual: Lifecycle Controller guided deployment

1. Open a Web browser from within the management network and navigate to the iDRAC IP address (192.168.1.101).
2. Log in with the iDRAC s username and password (Username: root ; Password: calvin).
3. Look at the Virtual Console Preview to see if the server is powered on. If there is no image, under Quick Launch Tasks, power the server on.
4. From the vertical navigation bar, select Alerts.
5. Select the SNMP and Email Settings tab from the horizontal navigation bar.
6. Check the State radio box for Alert Destination1 and type the destination IP address (192 . 168 . 1 . 50).
7. Verify that the Community String field is set to public.
8. Click Apply.
9. Change SNMP Trap Format to SNMP v2.
10. Click Apply.
11. Check the first State radio box for Destination Email Address and type the destination email address for Email Alert 1 (adminpager@principledtechnologies.com).
12. Click Apply.
13. In the SMTP (Email) Server IP Address or FQDN / DNS Name field, type the fully qualified domain name for the email server (mailer.principledtechnologies.com).
14. Click Apply.
15. Select the Alerts tab from the horizontal navigation bar.
16. Change Alerts to Enabled.
17. Click Apply.
18. Under Email, check the Amperage, Auto Sys Reset, and Battery Event critical alerts. Uncheck any non-critical alerts in this category.
19. Check the topmost radio box for SNMP Trap to check all radio boxes.
20. Check the topmost radio box for IPMI Alert to check all radio boxes.
21. Check the topmost radio box for Remote System Log to check all radio boxes.
22. Check the topmost radio box for WS Eventing to check all radio boxes.
23. Check the topmost radio box for OS Log to check all radio boxes.
24. Click the right arrow to navigate to the next page.
25. Under Email, check the Processor, Proc Absent, and Fan Event critical alerts. Uncheck any non-critical alerts in this category.
26. Check the topmost radio box for SNMP Trap to check all radio boxes.
27. Check the topmost radio box for IPMI Alert to check all radio boxes.
28. Check the topmost radio box for Remote System Log to check all radio boxes.
29. Check the topmost radio box for WS Eventing to check all radio boxes.
30. Check the topmost radio box for OS Log to check all radio boxes.
31. Click the right arrow to navigate to the next page.
32. Under Email, check the Hardware Config and Memory critical alerts. Uncheck any non-critical alerts in this category.
33. Check the topmost radio box for SNMP Trap to check all radio boxes.
34. Check the topmost radio box for Remote System Log to check all radio boxes.
35. Check the topmost radio box for WS Eventing to check all radio boxes.
36. Check the topmost radio box for OS Log to check all radio boxes.
37. Click the right arrow to navigate to the next page.

38. Under Email, check the OS Event, PCI Device, and Physical Disk critical alerts. Uncheck any non-critical alerts in this category.
39. Check the topmost radio box for SNMP Trap to check all radio boxes.
40. Check the topmost radio box for IPMI Alert to check all radio boxes.
41. Check the topmost radio box for Remote System Log to check all radio boxes.
42. Check the topmost radio box for WS Eventing to check all radio boxes.
43. Check the topmost radio box for OS Log to check all radio boxes.
44. Click the right arrow to navigate to the next page.
45. Under Email, check the BIOS POST, Power Supply, PSU Absent, and Power Usage critical alerts. Uncheck any non-critical alerts in this category.
46. Check the topmost radio box for SNMP Trap to check all radio boxes.
47. Check the topmost radio box for IPMI Alert to check all radio boxes.
48. Check the topmost radio box for Remote System Log to check all radio boxes.
49. Check the topmost radio box for WS Eventing to check all radio boxes.
50. Check the topmost radio box for OS Log to check all radio boxes.
51. Click the right arrow to navigate to the next page.
52. Under Email, check the Redundancy, IDSDM Media, and IDSDM Absent critical alerts. Uncheck any non-critical alerts in this category.
53. Check the topmost radio box for SNMP Trap to check all radio boxes.
54. Check the topmost radio box for IPMI Alert to check all radio boxes.
55. Check the topmost radio box for Remote System Log to check all radio boxes.
56. Check the topmost radio box for WS Eventing to check all radio boxes.
57. Check the topmost radio box for OS Log to check all radio boxes.
58. Click the right arrow to navigate to the next page.
59. Under Email, check the IDSDM Redundancy, Security Event, and Sys Event Log critical alerts. Uncheck any non-critical alerts in this category.
60. Check the topmost radio box for SNMP Trap to check all radio boxes.
61. Check the topmost radio box for IPMI Alert to check all radio boxes.
62. Check the topmost radio box for Remote System Log to check all radio boxes.
63. Check the topmost radio box for WS Eventing to check all radio boxes.
64. Check the topmost radio box for OS Log to check all radio boxes.
65. Click the right arrow to navigate to the next page.
66. Under Email, check the Software Config, Temperature, and Temperature Statistics critical alerts. Uncheck any non-critical alerts in this category.
67. Check the topmost radio box for SNMP Trap to check all radio boxes.
68. Check the topmost radio box for IPMI Alert to check all radio boxes.
69. Check the topmost radio box for Remote System Log to check all radio boxes.
70. Check the topmost radio box for WS Eventing to check all radio boxes.
71. Check the topmost radio box for OS Log to check all radio boxes.
72. Click the right arrow to navigate to the next page.
73. Under Email, check the vFlash Event and Voltage critical alerts. Uncheck any non-critical alerts in this category.
74. Check the topmost radio box for SNMP Trap to check all radio boxes.
75. Check the topmost radio box for IPMI Alert to check all radio boxes.
76. Check the topmost radio box for Remote System Log to check all radio boxes.
77. Check the topmost radio box for WS Eventing to check all radio boxes.
78. Check the topmost radio box for OS Log to check all radio boxes.
79. Click the right arrow to navigate to the next page.

80. Under Email, check the Battery Event, Storage Contr, and Storage Enclosr critical alerts. Uncheck any non-critical alerts in this category.
81. Check the topmost radio box for SNMP Trap to check all radio boxes.
82. Check the topmost radio box for Remote System Log to check all radio boxes.
83. Check the topmost radio box for WS Eventing to check all radio boxes.
84. Check the topmost radio box for OS Log to check all radio boxes.
85. Click the right arrow to navigate to the next page.
86. Under Email, check the Fan Event, Physical Disk, and Power Supply critical alerts. Uncheck any non-critical alerts in this category.
87. Check the topmost radio box for SNMP Trap to check all radio boxes.
88. Check the topmost radio box for Remote System Log to check all radio boxes.
89. Check the topmost radio box for WS Eventing to check all radio boxes.
90. Check the topmost radio box for OS Log to check all radio boxes.
91. Click the right arrow to navigate to the next page.
92. Under Email, check the Temperature and Virtual Disk critical alerts. Uncheck any non-critical alerts in this category.
93. Check the topmost radio box for SNMP Trap to check all radio boxes.
94. Check the topmost radio box for Remote System Log to check all radio boxes.
95. Check the topmost radio box for WS Eventing to check all radio boxes.
96. Check the topmost radio box for OS Log to check all radio boxes.
97. Click the right arrow to navigate to the next page.
98. Under Email, uncheck any non-critical alerts in this category.
99. Check the topmost radio box for SNMP Trap to check all radio boxes.
100. Check the topmost radio box for Remote System Log to check all radio boxes.
101. Check the topmost radio box for WS Eventing to check all radio boxes.
102. Check the topmost radio box for OS Log to check all radio boxes.
103. Click the right arrow to navigate to the next page.
104. Under Email, check the Licensing critical alert. Uncheck any non-critical alerts in this category.
105. Check the topmost radio box for SNMP Trap to check all radio boxes.
106. Check the topmost radio box for IPMI Alert to check all radio boxes.
107. Check the topmost radio box for Remote System Log to check all radio boxes.
108. Check the topmost radio box for WS Eventing to check all radio boxes.
109. Check the topmost radio box for OS Log to check all radio boxes.
110. Click the right arrow to navigate to the next page.
111. Under Email, uncheck any non-critical alerts in this category.
112. Check the topmost radio box for SNMP Trap to check all radio boxes.
113. Check the topmost radio box for Remote System Log to check all radio boxes.
114. Check the topmost radio box for WS Eventing to check all radio boxes.
115. Check the topmost radio box for OS Log to check all radio boxes.
116. Click Apply.
117. Click Virtual Console in the vertical navigation bar.
118. Click Launch Virtual Console.
119. A Java app will launch. Click Continue when the security warning appears.
120. Click Run when the Java warning appears.
121. Click Run when the second security warning appears and the remote console viewer will launch.
122. Assuming no boot devices are installed, strike F2 to enter System Setup and launch the System Setup menu.
123. At the System Setup Main Menu, select System BIOS.
124. Select Processor Settings.

125. Verify QPI Speed is set to Maximum data rate.
126. Verify that Virtualization Technology is Enabled.
127. Verify that Adjacent Cache Line Prefetch is Enabled.
128. Verify that Hardware Prefetcher is Enabled.
129. Verify that DCU Streamer Prefetcher is Enabled.
130. Verify that DCU IP Prefetcher is Enabled.
131. Verify that Execute Disable is Enabled.
132. Scroll down to verify that Number of Cores per Processor is 10 (Default: All).
133. Click the Back button.
134. Select SATA Settings.
135. Verify that Embedded SATA is AHCI Mode.
136. Click the Back button.
137. Select Boot Settings.
138. Verify that Boot Sequence Retry is Enabled.
139. Click the Back button.
140. Select Integrated Devices.
141. Verify that Embedded Video Controller is Enabled.
142. Scroll down to verify that OS Watchdog Timer is Disabled.
143. Click the Back button.
144. Select Serial Communication.
145. Verify that Serial Communication is Auto.
146. Verify that Serial Port Address is Serial Device1=COM1,Serial Device2=COM2 (Default: Serial Device1=COM2,Serial Device2=COM1).
147. Verify that External Serial Connector is Serial Device 1.
148. Verify that Failsafe Baud Rate is 115200.
149. Verify that Remote Terminal Type is ANSI (Default: VT100/VT220).
150. Click the Back button.
151. Select System Profile Settings.
152. Verify that System Profile is Custom (Default: Performance).
153. Verify that CPU Power Management is OS DBPM (Default: Maximum Performance).
154. Verify that Turbo Boost is Enabled.
155. Verify that C1E is Enabled (Default: Disabled).
156. Verify that Memory Frequency is Maximum Performance.
157. Verify that C States is Enabled (Default: Disabled).
158. Verify that Memory Patrol Scrub is Disabled (Default: Standard).
159. Scroll down to verify that Collaborative CPU Performance Control is Disabled.
160. Verify that Energy Efficient Policy is Balanced Performance (Default: Performance).
161. Click the Back button.
162. Select System Security.
163. Verify that NMI Button is Disabled.
164. Click the Back button.
165. Scroll down to select Miscellaneous Settings.
166. Verify that F1/F2 Prompt on Error is Disabled (Default: Enabled).
167. Verify that Load Legacy Video Option ROM is Enabled (Default: Disabled).
168. Click the Back button.
169. Click the Finish button.
170. A warning dialog will appear. Click the Yes button.
171. A second dialog will appear alerting the user that the settings were saved successfully. Click the OK button.

172. At the System Setup Main Menu, select Device Settings.
173. Select Integrated RAID Controller 1.
174. Click Configuration Management.
175. Click Create Virtual Disk.
176. Select RAID Level change to RAID5.
177. Select Select Physical Disks.
178. Select Check All to select all unconfigured disks.
179. Scroll down to click Apply Changes.
180. Click OK.
181. Scroll down, and change Default Initialization to Fast.
182. Select Create Virtual Disk.
183. Check Confirm, and click Yes.
184. Click Ok.
185. Click the Back button.
186. Click the Back button again.
187. Click Finish.
188. At the Device Settings menu, select the Integrated NIC 1 Port 1.
189. Click NIC Configuration.
190. Verify that Legacy Boot Protocol is set to None (Default: PXE).
191. Click Back.
192. Click Finish.
193. Click Yes, and click OK.
194. At the Device Settings menu, select the Integrated NIC 1 Port 2.
195. Click NIC Configuration.
196. Verify that legacy boot protocol is set to None.
197. Click the Back button.
198. Click the Finish button.
199. Click the Finish button again.
200. At the System Setup Main Menu, select iDRAC Settings.
201. Select Network.
202. Scroll down to the IPMI Settings category and set Enable IPMI Over LAN to Enabled (Default: Disabled).
203. Click the Back button.
204. Select Alerts.
205. Verify that Enable Platform Event Filter Alerts is Enabled.
206. Verify that Enable Alert Destination 1 is Enabled.
207. Verify that Alert Destination 1 is 192.168.1.50.
208. Click the Back button.
209. Click the Finish button.
210. A warning dialog will appear alerting the user that Settings have changed. Do you want to save the changes?
Click the Yes button.
211. A second dialog will appear alerting the user that the settings were saved successfully. Click the OK button.
212. At the System Setup Main Menu, click the Finish button to apply all changes and reboot.
213. A warning dialog will appear confirming the exit command and prompting the user Are you sure you want to exit and reboot? Click the Yes button to reboot.
214. Press F10 to enter Lifecycle Controller.
215. Click OS Deployment.
216. Click Deploy OS.
217. Select Go Directly to OS Deployment, and click Next.

218. Select Microsoft Windows 2012 R2, and click Next.
219. Select Manual Install, and click Next.
220. Click Next to accept the default BIOS mode.
221. Insert the installation media, and click Next.
222. Click Finish to reboot the server and begin installation.

OME Auto Deployment

This procedure assumes a CSV list of Service Tags and a baseline profile have already been created.

1. Open a Web browser and log in to OME.
2. Select Deployment.
3. Click Setup Auto Deployment.
4. Check the box for Deploy Template.
5. Check the box for Boot to Network ISO.
6. Click Next.
7. Expand Server Templates, and select the template to deploy.
8. Click Next.
9. Enter the ISO Filename you want to deploy. We used `windows2012r2.iso`
10. Enter the IP address of the OME server. We used `192.168.1.50`
11. Enter the share name of the deployment share. We entered `ServerConfig`
12. Enter the Share Username you configured for your deployment File Share. We used `test\administrator`
13. Enter the share password you configured for your deployment file share user. We used `Password1`
14. Click Next.
15. Click Import.
16. Browse to the location of the CSV file containing hardware Service Tags, and click Open.
17. Click Ok. The servers from the CSV will be imported.
18. Click Next.
19. Click Next to accept defaults for template deployment.
20. Click Next to accept default iDRAC credentials.
21. Review the summary, and click Finish.
22. Click Yes to proceed.
23. Click Yes to confirm job creation.

New features for connectivity

iDRAC Direct (cable)

Manual: Crash cart

1. Plug the crash cart power strip into a power outlet.
2. Remove the front bezel.
3. Connect a keyboard to the server front panel.
4. Connect a mouse to the server front panel.
5. Connect a monitor to the server front panel.
6. Reboot Server.
7. Press F2 to enter system setup.
8. Click Device Settings.
9. Click Integrated Raid Controller 1: Dell PERC <PERC H730P Mini> Configuration Utility.
10. Click Configuration Management.
11. Click Create Virtual Disk.
12. Select RAID1.

13. Click Select Physical Disks.
14. Check the boxes besides the disks to add them to the array.
15. Click Apply Changes.
16. Click OK.
17. Scroll down to Default Initialization. Select Fast.
18. Click Create Virtual Disk.
19. Check the box to Confirm.
20. Click Yes.
21. Click OK.
22. Click Back.
23. Click Back again.
24. Click Finish.
25. Click Finish again to exit Device Settings.
26. Click Finish to exit System Setup.
27. Click Yes to confirm exit and boot the server.

Automatic: USB A-A male-male cable

1. Remove the front bezel.
2. Connect a laptop to the server using a USB A/A cable. The USB cable must be connected to the server's USB management port, indicated on the front panel with a wrench icon.
3. Open a Web browser on the management laptop.
4. Connect to iDRAC at 169.254.0.3, and accept any certificate or security warnings.
5. Log in with your username and password.
6. Click Storage→Virtual Disks.
7. Click Create.
8. For Layout, select RAID-1.
9. Under Internal Disks, check the boxes to select the disks to add to the array.
10. Click Create Virtual Disk.
11. Click OK. Alternatively, you can view the job status by clicking Job Queue.
12. Log off of iDRAC.

iDRAC Direct (USB key)

Manual configuration

We used the time and steps from the Zero-Touch manual configuration.

Automatic: iDRAC Direct USB Key

1. Remove the bezel.
2. Connect a monitor to the server front panel, or observe the system through a remote console.
3. Insert a USB device with the necessary configuration profile.
4. Wait for the server to restart, as indicated by the monitor returning no signal.

Quick Sync (NFC)

Manual Read Procedure

1. Plug a monitor into an outlet.
2. Remove the front bezel.
3. Connect the monitor to the server.
4. Connect a keyboard to the server.
5. Connect a mouse to the server.
6. Power on the server.

7. Press F10 to enter Lifecycle Controller.
8. Select Firmware Update.
9. Select View Current Versions.
10. Verify that the BIOS, Lifecycle Controller, PERC H730P Mini, and System CPLD are all up to date (0.3.23; 2.00.00.00; 25.2.1.0037; 0.5.1).
11. Return to the main menu.
12. Select Settings.
13. Select Network Settings.
14. Check the IP Address, Default Gateway, and DNS Address.
15. Return to the main menu.
16. Exit Lifecycle Controller.
17. Remove the keyboard, monitor, and mouse.
18. Reinstall the front bezel.

Automatic Read Procedure (NFC + tablet)

1. Unlock the tablet.
2. Open the OpenManage application on the NFC-capable tablet.
3. Press the NFC button on front bezel.
4. Hold the tablet's NFC to the iDRAC Quick Sync and wait for tablet to refresh.
5. Touch Firmware Details.
6. Verify that the BIOS, Lifecycle Controller, PERC H730P Mini, and System CPLD are all up to date (0.3.23; 2.00.00.00; 25.2.1.0037; 0.5.1). Return to the main menu.
7. Touch the back arrow to go back to the main menu.
8. Touch Network Details.
9. Touch IPv4.
10. Check the IP Address, Default Gateway and DNS Address.
11. Touch the back arrow twice to return to the main menu.
12. Close the application.

Manual Write Procedure

1. Remove the front bezel.
2. Press the check button beside the R730 LCD screen.
3. Press the right arrow button to select Setup.
4. Press the check button to enter Setup.
5. Press the check button to select iDRAC.
6. Press the right arrow button to select Static.
7. Press the check button to enter a Static IP address.
8. Set the IP address for the iDRAC. We used 172.16.10.120. Use the arrow keys to select an IP address digit.
Press the checkbox to edit the digit. Press the arrow keys to modify the value of the digit. Press the check button to accept the value. Repeat for each digit.
9. Press the right arrow key to move the cursor to the far right.
10. Press the check button.
11. Set the Subnet Mask. We used 255.255.0.0. Use the arrow keys to select an IP address digit. Press the checkbox to edit the digit. Press the arrow keys to modify the value of the digit. Press the check button to accept the value. Repeat for each digit.
12. Press the right arrow key to move the cursor to the far right.
13. Press the check button.

14. Set the IP address for the Gateway. We used 172.16.10.1. Use the arrow keys to select an IP address digit. Press the checkbox to edit the digit. Press the arrow keys to modify the value of the digit. Press the check button to accept the value. Repeat for each digit.
15. Press the right arrow key to move the cursor to the far right.
16. Press the check button.
17. Press the check button to select Yes and setup DNS.
18. Set the IP address for the DNS. We used 172.16.0.10. Use the arrow keys to select an IP address digit. Press the checkbox to edit the digit. Press the arrow keys to modify the value of the digit. Press the check button to accept the value. Repeat for each digit.
19. Press the right arrow key to move the cursor to the far right.
20. Press the check button.
21. Set the IP address for the secondary DNS. We used 172.16.0.11. Use the arrow keys to select an IP address digit. Press the checkbox to edit the digit. Press the arrow keys to modify the value of the digit. Press the check button to accept the value. Repeat for each digit.
22. Press the right arrow key to move the cursor to the far right.
23. Press the check button.
24. Press the check button to save the configuration to the iDRAC.
25. Replace the front bezel.

Automatic Write Procedure (NFC + tablet)

1. Unlock the tablet.
2. Open the OpenManage application on the NFC-capable tablet.
3. Press the NFC button on the front bezel.
4. Place the tablet against the NFC area of the front bezel. The configuration will be imported.
5. Tap the gear icon at the top right of the page.
6. Tap iDRAC Configuration via Quick Sync (NFC bezel).
7. Tap IPv4 Settings.
8. Tap the checkbox for Enable DHCP to clear it.
9. Tap the top field for the IP address.
10. Using the tablet keyboard, enter the IP address. We used 172.16.10.120.
11. Tap the middle field for the Gateway address.
12. Using the tablet keyboard, enter the IP address. We used 172.16.10.1.
13. Tap the third field for the Subnet Mask.
14. Using the tablet keyboard, enter the IP address. We used 255.255.0.0.
15. Tap the checkbox for Use DHCP for DNS to clear it.
16. Tap the fifth field for the primary DNS address.
17. Using the tablet keyboard, enter the IP address. We used 172.16.10.10.
18. Tap the sixth field for the secondary DNS address.
19. Using the tablet keyboard, enter the IP address. We used 172.16.10.11.
20. Tap Save.
21. Enter the username and password of the iDRAC you are going to update. We used the username `root` and the password `calvin`.
22. Press Sync Now.
23. Press the NFC button on the front bezel.
24. Touch the tablet to the NFC bezel to perform a Quick Sync.
25. Close the OpenManage app.

New features to improve maintenance

Tech Support Report

Manual (12G TSR + DSET)

1. Log in to iDRAC with your username and password.
2. Under Server in the vertical navigation menu, select Troubleshooting.
3. Select Tech Support Report in the horizontal navigation bar.
4. Fill out the required network information. For our tests, we used CIFS:
 - a. IP Address: 192.168.1.20
 - b. Share name: profiles
 - c. Domain Name: <blank>
 - d. Username: Administrator
 - e. Password: Password1
5. Click Export.
6. Click Server in the vertical navigation menu.
7. Click Job Queue in the horizontal navigation bar.
8. Refresh the page until the job status reports Completed.
9. Click Virtual Console in the vertical navigation menu.
10. Click Launch Virtual Console.
11. Click Continue.
12. Click Run.
13. Click Run again.
14. Click Macros, and click Ctrl-Alt-Delete.
15. Log in to Windows with your username and password.
16. Open a Web browser and navigate to `dell.com/dset`
17. Download DSET for Windows.
18. Run the downloaded application.
19. Click Next.
20. Accept the license agreement.
21. Leave Create a One-Time Local System DSET Report as default, and click Next.
22. Enter the network file share location (`\\192.168.1.20\profiles`).
23. Check Enable Report Filtering and Automatically Upload the Report to Dell.
24. Click Next.
25. Leave Hardware Information, Storage Information, and Software Information checked by default.
26. Check Gather Advanced Log Files Information.
27. Click Next.
28. Click Start.
29. A command window will appear and update the report generation and upload status. The window will automatically close. Click Finish.
30. Sign out of the Windows server.

Automatic (13G TSR)

1. Log into iDRAC with your username and password.
2. Under Server in the vertical navigation menu, select Troubleshooting.
3. Select Tech Support Report in the horizontal navigation bar.
4. Select Advanced Export Options.
5. Check RAID Controller Log and OS and Application Data, and ensure Enable Report Filtering is checked.
6. Under Export Location, change the radio button to Network.
7. Fill out the required network information. For our tests, we used CIFS:

- a. IP Address: 192.168.1.20
 - b. Share name: profiles
 - c. Domain Name: <blank>
 - d. Username: Administrator
 - e. Password: Password1
8. Check I agree to allow Technical Support to use this data.
 9. Click Export.
 10. View the status of the export by clicking the job queue button.
 11. Refresh the page until the job status reports Completed.

OME Compliance Baseline Management

Manual (12G Configuration Settings) Compliance Check

We used a spreadsheet to keep track of all configuration items for the manual scenario. For every verification step in this methodology, if the setting is correct, mark C for compliant; if the setting is missing, mark M for missing; if the setting is different than the configuration baseline, mark D for different, and write the current setting in the non-compliant value cell in the compliance spreadsheet.

1. Connect a monitor.
2. Connect a keyboard.
3. Connect a mouse.
4. Power on the server.
5. Strike **F2** to enter System Setup when prompted.
6. At the System Setup Main Menu, select System BIOS.
7. Select Processor Settings.
8. Verify QPI Speed is set to Maximum Data Rate.
9. Verify that Virtualization Technology is Enabled.
10. Verify that Adjacent Cache Line Prefetch is Enabled.
11. Verify that Hardware Prefetcher is Enabled.
12. Verify that DCU Streamer Prefetcher is Enabled.
13. Verify that DCU IP Prefetcher is Enabled.
14. Verify that Execute Disable is Enabled.
15. Verify that Number of Cores per Processor is All.
16. Click the Back button.
17. Select SATA Settings.
18. Verify that Embedded SATA is AHCI Mode.
19. Click the Back button.
20. Select Boot Settings.
21. Verify that Boot Sequence Retry is Enabled.
22. Click the Back button.
23. Select Integrated Devices.
24. Verify that OS Watchdog Timer is Disabled.
25. Verify that Embedded Video Controller is Enabled.
26. Click the Back button.
27. Select Serial Communication.
28. Verify that Serial Communication is On with Console Redirection.
29. Verify that Serial Port Address is configured as follows: Serial Device1=COM1, Serial Device2=COM2.
30. Verify that External Serial Connector is set to Serial Device 1.
31. Verify that Failsafe Baud Rate is set to 115200.

32. Verify that Remote Terminal Type is set to ANSI.
33. Click the Back button.
34. Select System Profile Settings.
35. Verify that System Profile is set to Custom.
36. Verify that CPU Power Management is set to OS DBPM.
37. Verify that Memory Frequency is set to Maximum Performance.
38. Verify that Turbo Boost is Enabled.
39. Verify that C1E is Enabled.
40. Verify that C States is Enabled.
41. Verify that Memory Patrol Scrub is Disabled.
42. Verify that Collaborative CPU Performance Control is Disabled.
43. Click the Back button.
44. Select System Security.
45. Verify that NMI Button is Disabled.
46. Click the Back button.
47. Select Miscellaneous Settings.
48. Verify that F1/F2 Prompt on Error is Disabled.
49. Click the Back button.
50. Click the Finish button.
51. At the System Setup Main Menu, select Device Settings.
52. Select the Integrated NIC 1 Port 1.
53. Click NIC Configuration.
54. Verify that Legacy Boot Protocol is set to None.
55. Click Back.
56. Click Finish.
57. At the Device Settings menu, select the Integrated NIC 1 Port 2.
58. Click NIC Configuration.
59. Verify that legacy boot protocol is set to None.
60. Click the Back button.
61. Click the Finish button.
62. Click the Finish button again.
63. At the System Setup Main Menu, select iDRAC Settings.
64. Select Network.
65. Scroll down to the IPMI Settings category, and verify that Enable IPMI Over LAN is Enabled.
66. Click the Back button.
67. Select Alerts.
68. Verify that Enable Platform Event Filter Alerts is Enabled.
69. Verify that Enable Alert Destination 1 is Enabled
70. Verify that Alert Destination 1 is 192.168.1.50.
71. Click the Back button.
72. Click the Finish button.
73. At the System Setup Main Menu, click the Finish button.
74. A warning dialog will appear confirming the exit command and prompting the user Are you sure you want to exit? Click the Yes button to reboot.

OME Baseline Configuration Compliance Check

1. Open a Web browser and connect to OME.
2. Select Manage→Configuration.
3. Click the red section of the pie chart indicated as non-compliant.

4. Double-click an entry in the pop-out table.
5. Note the missing and different settings. These are sortable and can be exported to HTML.

New features to simplify updating

OME Agentless Driver Updates

OS Driver Updates using OMSA

Installing OMSA (one time task)

1. Log into remote server.
2. Browse to the location of the OMSA installation file.
3. Double-click setup.exe.
4. When prompted, click Run.
5. Correct any conditions that create an error, and click Install Server Administrator.
6. Click Next.
7. Select I accept the terms in the license agreement and click Next.
8. Click Typical and select Next.
9. Click Install.
10. Click Finish.

Performing Updates with OMSA

1. On the OME server, log in to OME.
2. Click Manage→System Update.
3. Click Select a Catalog Source in the left hand menu.
4. Select Use repository manager file.
5. Click Browse and select the catalog.xml file you want to use for the baseline.
6. Click Open to select the catalog.xml file.
7. Click Import Now. The compliance report will regenerate.
8. Click the red section of the chart indicating Non-Compliant Systems.
9. Check the box beside a non-compliant system. Note the preferred Delivery Method is In-Band Agent.
10. Under Select Updates to Apply, check the topmost box to select all updates.
11. Click Apply Selected Updates.
12. Select Run Now under Set the Task Schedule.
13. Check the box for Skip Signature and Hash Check.
14. Enter the server credentials for the task. We used `test\administrator` and `Password1`.
15. Click Finish.

OS Driver Updates without OMSA

Performing Inventory (one time task creation)

1. On the OME server, log in to OME.
2. Click Manage→Remote Tasks.
3. Under Common Tasks, click Create F/W and Driver Inventory Task.
4. Check the box for 64-bit system.
5. Click Next.
6. Select the radio button for Select server(s) for this task to target.
7. Expand Servers and select the server you want to inventory.
8. Click Next.
9. Under Set Schedule, select Periodic.

10. Select how frequently you want to conduct the inventory.
11. Enter the credentials to use on the remote target. We used `test\administrator` and `Password1`.
12. Click Finish.

Performing Updates without OMSA

1. On the OME server, log into OME.
2. Click Manage→System Update.
3. Click Select a Catalog Source in the left hand menu.
4. Select Use repository manager file.
5. Click Browse and select the catalog.xml file you want to use for the baseline.
6. Click Open to select the catalog.xml file.
7. Click Import Now. The compliance report will regenerate.
8. Click the red section of the chart indicating Non-Compliant Systems.
9. Check the box beside a non-compliant system. Note the preferred Delivery Method is In-Band Agent.
10. Under Select Updates to Apply, check the topmost box to select all updates.
11. Click Apply Selected Updates.
12. Select Run Now under Set the Task Schedule.
13. Check the box for Skip Signature and Hash Check.
14. Enter the server credentials for the task. We used `test\administrator` and `Password1`.
15. Click Finish.

Repository Manager and Automatic Updates.

Manual firmware updates – iDRAC

1. On a management workstation, open a Web browser and login to the iDRAC.
2. Click iDRAC Settings→Update and Rollback.
3. Click Browse to locate the BIOS update file.
4. Select the file, and click Open.
5. Click upload to transmit the file from the management workstation to the iDRAC.
6. Click Browse to locate the iDRAC update file (ESM_Firmware).
7. Select the file, and click Open.
8. Click upload to transmit the file from the management workstation to the iDRAC.
9. Click Browse to locate the Lifecycle Controller update file.
10. Select the file, and click Open.
11. Click upload to transmit the file from the management workstation to the iDRAC.
12. Click Browse to locate the NIC update file.
13. Select the file, and click Open.
14. Click upload to transmit the file from the management workstation to the iDRAC.
15. Click Browse to locate the RAID controller update file.
16. Select the file, and click Open.
17. Click upload to transmit the file from the management workstation to the iDRAC.
18. Click the checkbox beside content at the top of the Update Details section to select all uploaded components.
19. Click Install and Reboot.
20. Click OK to confirm job submission.

Automatic Updates (setup only – not counted as repetitive administrative task)

(Note: 72 seconds – not included in timed runs.)

1. Log into iDRAC with your username and password.
2. Select iDRAC Settings→Update and Rollback.
3. Click the Automatic Update tab.
4. Check the box for Enable Automatic Updates.
5. For Server Reboot, select Schedule Updates and Reboot Server.
6. For File Location, select Network.
7. For Protocol, select CIFS.
8. Enter the IP address of the repository host. We used 192.168.1.20.
9. Enter the share name that houses the repository. We used repoman.
10. Enter the username with access to the repository share. We used administrator.
11. Enter the password of the user with access to the share. We used Password1.
12. Enter the start time for the maintenance window. We used 00:00.
13. Select Monthly and use the pull-down menus to select the first Sunday of every one month.
14. Click Schedule Update.
15. Click OK to confirm that the Auto Update setup is complete.

ABOUT PRINCIPLED TECHNOLOGIES



Principled Technologies, Inc.
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