DELL OPENMANAGE ESSENTIALS: IMPROVE EFFICIENCY WITH FEWER TOOLS, MORE BENEFITS

SAVE TIME AND MONEY WITH DELL™OPENMANAGE™ ESSENTIALS*

63% less time to update firmware

40% less time to deploy servers

93% lower licensing cost

*versus HP®OneView solution

When new servers arrive in your data center, you might expect that deploying, configuring, and providing ongoing maintenance will be tedious, repetitive, and time-consuming tasks. If your experience includes deploying servers individually and updating firmware manually, your valuable time and operating expenses may have been consumed unnecessarily. We found that using a central console to streamline and automate routine data center operations can enable companies to reduce administration time and manage IT operations more efficiently.

In the Principled Technologies labs, we compared frequently performed server management tasks using two solutions: (1) a new Dell PowerEdge R630 server managed with Dell OpenManage Essentials, and (2) a new HP ProLiant DL380 Gen9 server managed with HP OneView. We compared time savings, feature sets, and systems management licensing costs.

In our tests, deploying Dell PowerEdge servers with Dell OpenManage Essentials took much less time than deploying HP ProLiant servers with HP OneView. When we deployed a Dell PowerEdge R630 with Dell OpenManage Essentials (OME) and an HP ProLiant DL380 with HP OneView, **the Dell solution took 40 percent less IT administrator time, required just one tool, and incurred 93 percent lower licensing costs**.

The HP solution required use of an additional tool, HP Insight Control for server provisioning, which meant that servers had to be discovered twice. An IT administrator had to switch between OneView and Insight Control during provisioning and deployment, increasing the possibility of errors. **For quick, easy and accurate**

A PRINCIPLED TECHNOLOGIES REPORT

deployment of servers, Dell OpenManage Essentials proved to be faster and more full-featured than the HP solution.

Along with the cost savings—a 50-server deployment could save $51,400 and a 200-server deployment could save $205,600—these advantages make Dell OpenManage Essentials an extremely attractive management solution.

DELL OPENMANAGE ESSENTIALS AND DELL POWEREDGE SERVERS

Dell OpenManage Essentials (OME) version 2.0 is the latest release of Dell's console solution that comprehensively monitors Dell and third-party hardware and also provides full lifecycle management of Dell PowerEdge servers. OpenManage Essentials is easy both to install and to use. Released in September 2014, OpenManage Essentials v2.0 provides comprehensive dashboards to view the health of server components and delivers centralized deployment of multi-generation Dell server firmware, configurations, and operating systems. The OpenManage Essentials console is available as a no-charge software download from Dell.com, installs on a server running Microsoft Windows Server, and requires an SMB file share for OS deployment.

Licensing a properly configured server through OME is simple on a Dell PowerEdge R630; each Dell PowerEdge 12th and 13th generation server requires only the purchase of an OpenManage Essentials Server Configuration Management License in order for OME to automate a multitude of server lifecycle management tasks. This license enables OME to deploy a configuration template, establish a baseline configuration, and verify and report on configuration compliance. The Server Configuration Management License also allows OME to deploy operating systems to many Dell bare-metal servers simultaneously.

HP ONEVIEW AND HP PROLIANT SERVERS

HP OneView, first released in 2013, also provides users with a centralized management and monitoring solution. HP OneView manages firmware, configurations, and alert monitoring. However, to deploy an operating system to HP bare-metal servers, HP requires the use of a separate additional tool: HP Insight Control for server provisioning. HP provides VMware and Hyper-V templates for installing both of the HP tools as virtual appliances. HP Insight Control for server provisioning requires an SMB file share for OS deployment.

The HP OneView solution is licensed per node and has a limited feature set when operating without iLO Advanced Licenses activated on each managed

server. Configuration and discovery is possible without an iLO Advanced License on each server, but for most major tasks such as OS deployment and viewing utilization data, an iLO Advanced License is necessary.

THE DELL AND HP SOLUTIONS COMPARED

Installation

The Dell OpenManage Essentials solution requires both Windows Server 2008 SP2 or newer and an instance of Microsoft SQL Server. The installer for OpenManage Essentials includes a SQL Express installation for smaller deployments—we used this version in our study. The Dell OpenManage Essentials installer automatically detects and installs prerequisites, shortening the install time considerably. An SMB file share is required for deployment of any operating systems (OSes); this can be on the same system as OME or on a separate machine. For this study, a separate machine hosted all operating system installation media.

The HP OneView appliance comes packaged as either a Hyper-V-ready template, or a VMware ESXi-ready template. However, to deploy operating systems, HP also requires the availability of HP Insight Control for server provisioning, which runs on a separate virtual machine. HP Insight Control also comes packaged in both Hyper-V and VMware ESXi templates. To deploy operating systems, HP Insight Control requires the availability of an SMB file share, but the same virtual machine running Insight Control cannot host the SMB file share.

The HP solution requires a minimum of three virtual machines, while the Dell OpenManage Essentials solution requires only a single virtual machine.

Dell delivers faster server provisioning plus compliance monitoring

In both solutions, users can create profiles or templates that contain information on firmware revisions, BIOS settings, and other configuration information. Each solution can monitor servers for errors, but **only the Dell OpenManage Essentials solution provides information on configuration drift,** instances when servers no longer align with a configuration baseline.

Because Dell OpenManage Essentials does not require the use of two separate tools as does the HP OneView solution, **Dell reduces complexity and the potential for errors, and also speeds the server provisioning and deployment processes.**

As Figure 1 shows, **creating a server template using Dell OpenManage Essentials took 88.5 percent less time than doing so using HP OneView**.

Figure 1: Time in seconds necessary for server template creation using the Dell and HP management solutions. Lower is better.
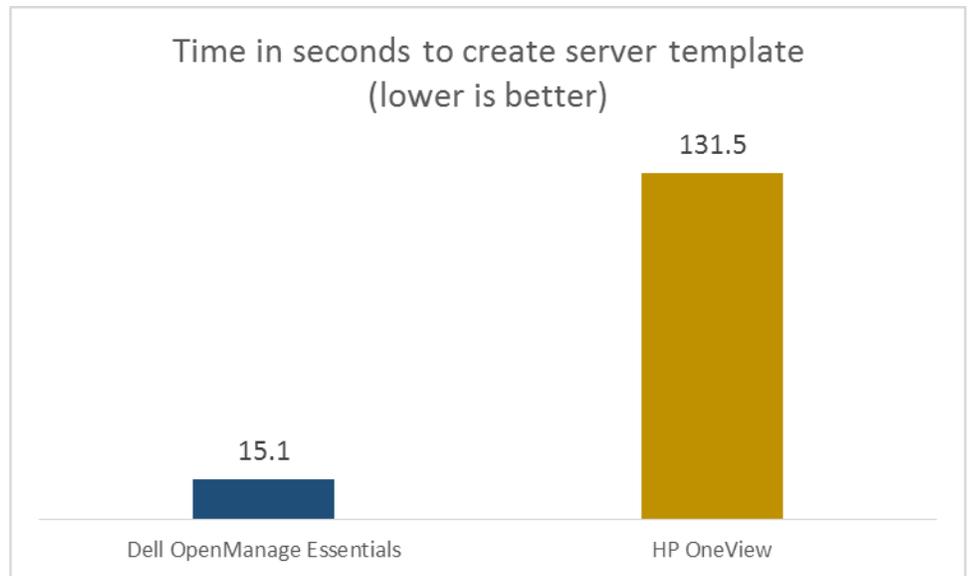
Faster OS deployment with Dell

We measured the time and steps it took to rack and stack a new server, discover it within the management solution, create a template, and deploy an operating system to the server.

Deploying an operating system using OpenManage Essentials is simple—all management tasks occur within OME. You can deploy both a configuration profile and an operating system at the same time using the Deployment Template Wizard, shown below in Figure 2.

Figure 2: Simple wizard-driven Deployment Template in Dell OME.
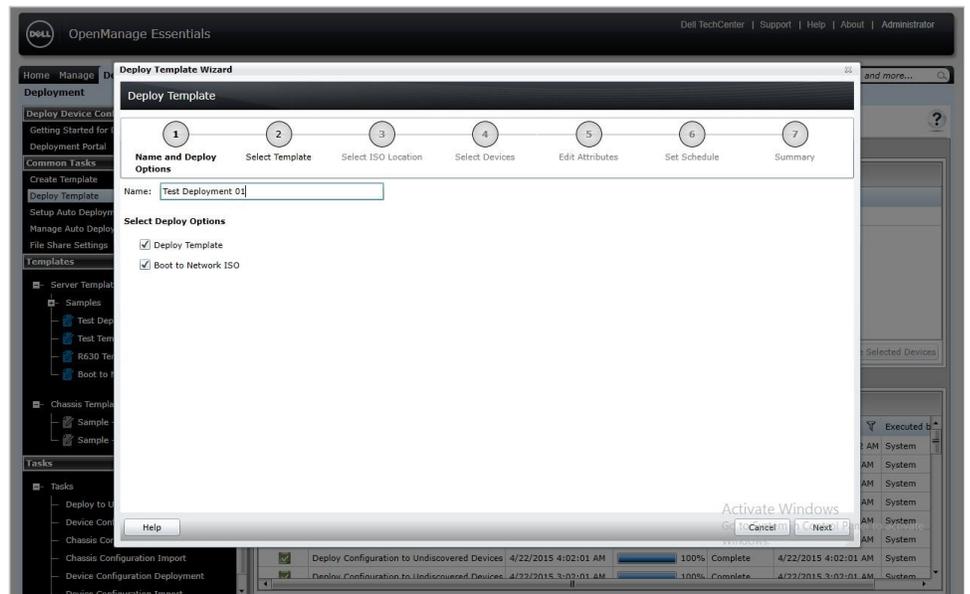
The HP solution requires the use of two separate tools: HP OneView and HP Insight Control for server provisioning. HP OneView manages all alerts, firmware updates, and BIOS settings, while Insight Control performs the deployment of the operating systems. Because of the required use of two tools, IT administrators must discover each system twice—once in each of the two tools.

As Figure 3 shows, **deploying a server from racking to OS deployment using Dell OpenManage Essentials took 40.5 percent less time than doing so using HP OneView.**

Figure 3: Time in seconds necessary for deploying a server from racking to OS deployment using the Dell and HP management solutions Lower is better.
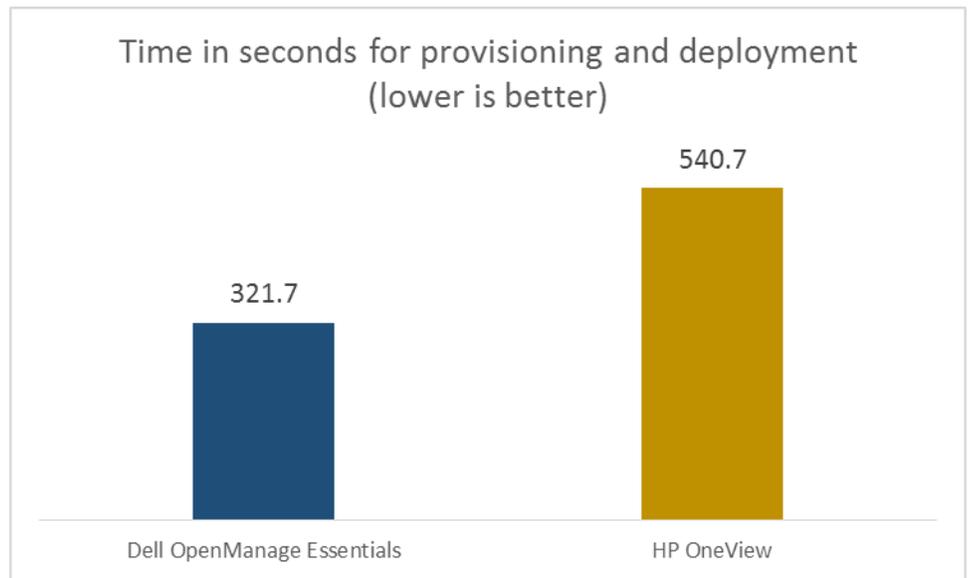
Faster firmware updating with Dell

Dell OpenManage Essentials can download firmware updates automatically from a repository allowing the process to use the most up-to-date firmware. Possible repository sources include custom repositories maintained by your staff or an online repository provided by Dell.

HP OneView requires the user to download a Service Pack for ProLiant (SPP), which contains updates for all ProLiant servers, and then requires an upload of that file to the appliance. Because SPPs are released only every month or so, servers may not receive critical patches as soon as they are actually available.

As Figure 4 shows, **updating server firmware took 63.3 percent less time with the Dell solution than with the HP solution.**

Time in seconds to update server firmware
(lower is better)

Figure 4: Time in seconds necessary for updating server firmware using the Dell and HP management solutions. Lower is better.
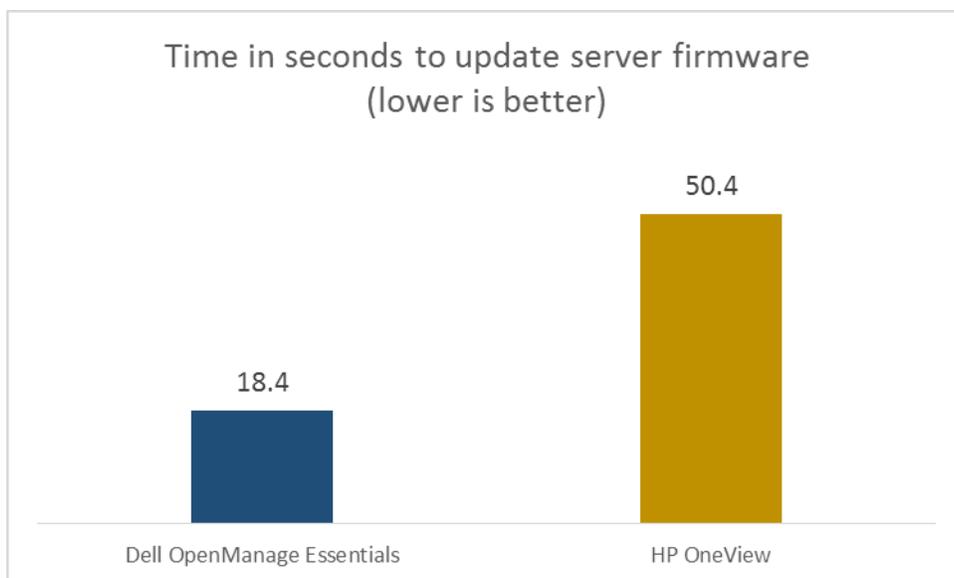
More functionality, fewer tools, and a lower cost with Dell

The Dell OpenManage Essentials solution required only the addition of a Server Configuration Management License to execute all of our tested use cases.

The HP OneView solution requires that both the HP OneView appliance and each managed server have an iLO Advanced License to unlock all features. HP OneView node licenses come with rights to use Insight Control server provisioning for OS deployments, but to perform all three of our test use cases, HP servers additionally require an iLO Advanced License.

Figure 5 summarizes these requirements.

Use case	Licenses needed for Dell solution	Licenses needed for HP solution
Server template creation	Server Configuration Management license [1]	HP OneView[2] + iLO Advanced licenses[3]
OS deployment	Server Configuration Management license	HP OneView + iLO Advanced licenses
Server firmware update		HP OneView + iLO Advanced licenses

Figure 5: License requirements for performing our use cases with the Dell and HP management solutions.

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[1] Pricing for Dell OME (Embedded Systems Management/iDRAC8 Express + OpenManage Essentials Server Configuration Management): configure.us.dell.com/dellstore/config.aspx?oc=pe_r630_1337&model_id=poweredge-r630&c=us&l=en&s=bsd&cs=04

[2] Pricing for HP OneView: h30094.www3.hp.com/product/sku/10715614/mfg_partno/E5Y39AAE

[3] Pricing for HP iLO Advanced for Rack Servers: h30094.www3.hp.com/product.aspx?cache=2043299774&culture=en-US&sku=3957324

Figure 6 compares the price of the Dell and HP solutions. As it shows, **Dell OpenManage Essentials** (available as a no-charge software download) **plus Server Configuration Management, at $70 is 93.0 percent less expensive than HP OneView ($699) plus iLO Advanced ($399).**

Figure 6: Cost of the licenses the Dell and HP solutions require. Lower is better.
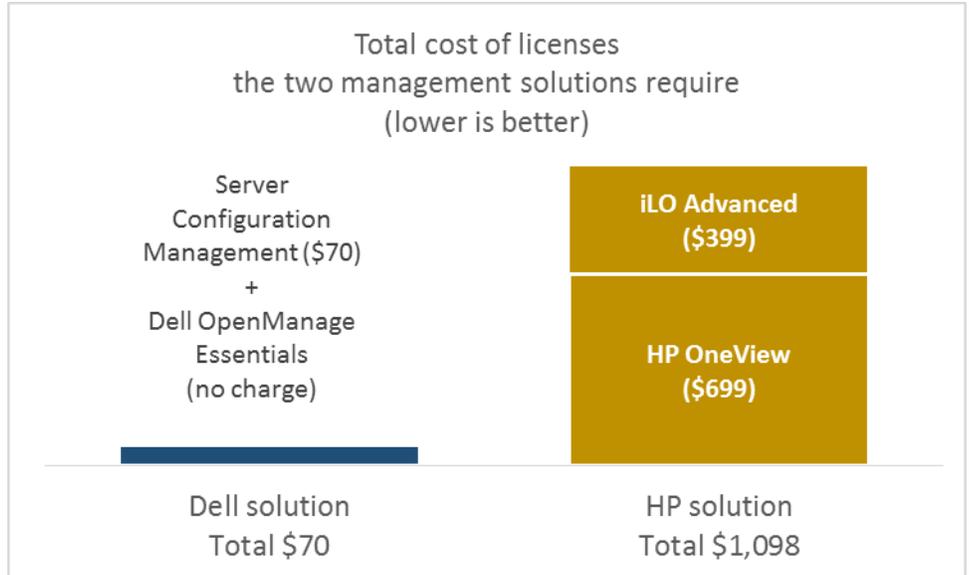
The cost savings that the Dell solution provides rapidly increase when we look beyond the single instance we compare above to organizations with dozens or hundreds of servers. Figure 7 shows the licensing costs for the two solutions in two hypothetical deployments. For the 50-server deployment, the organization would save $51,400. With 200 servers, the savings would increase to $205,600.

Figure 7: Cost of the licenses the Dell and HP solutions require. Lower is better.
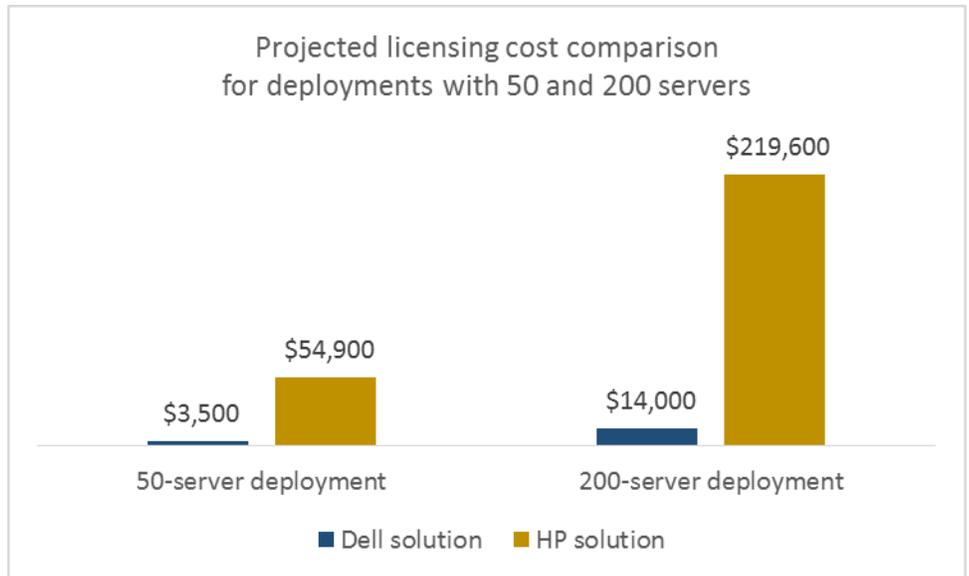
Server configuration baseline compliance available only with Dell

In addition to providing faster provisioning and deployment services, we also found that Dell OpenManage Essentials offered features that HP OneView did not.

Over time, a server's configuration inevitably changes. Traditionally, keeping track of those changes has been a challenge. For example, when configuration changes are made to a server's BIOS settings to facilitate the installation of new software or hardware, system administrators have historically had to rely on technicians to alert them of those changes. Keeping track of a server's configuration over time meant taking good notes with frequent inventorying and auditing, requiring additional time, labor, and expense.

With the Compliance Portal available in Dell OpenManage Essentials (see Figure 8), we were able to monitor configuration changes over time against a baseline profile setting. When an undesirable change occurred to a Dell server's configuration, we were able to easily detect the drift and rectify the changes to comply with the baseline profile.
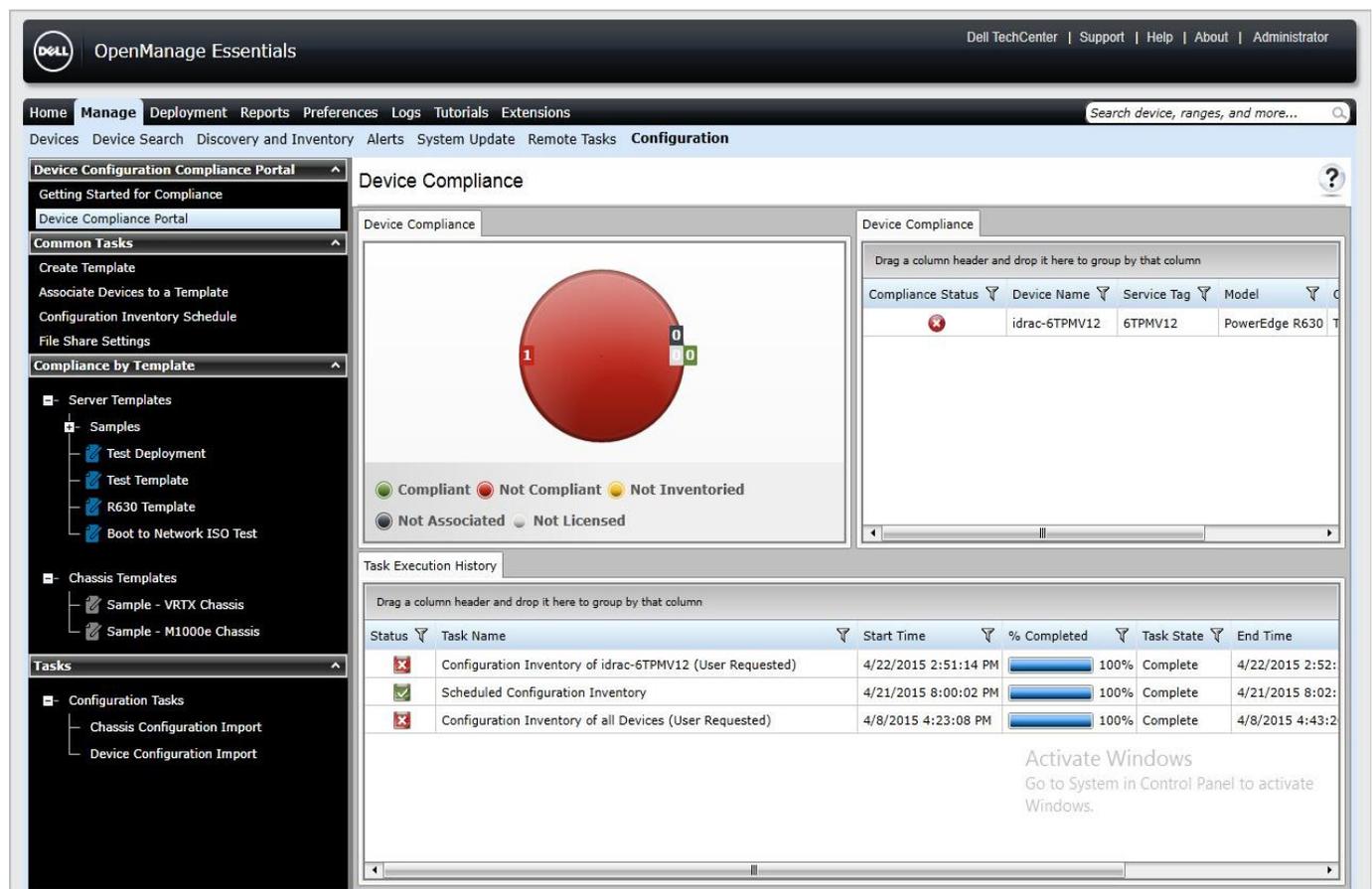
Figure 8: Device Compliance Portal in Dell OME.

When monitoring configuration changes in HP OneView, we found that there was no way to detect any specific changes we made to the HP ProLiant DL360. In fact, when we navigated to the iLO for the HP server being managed by HP OneView, we were presented with the following alert, shown below in Figure 9: **"Warning this system is being managed by: HP OneView. Changes made locally in iLO will be out of sync with the centralized settings and could affect the behavior of the remote management system."**
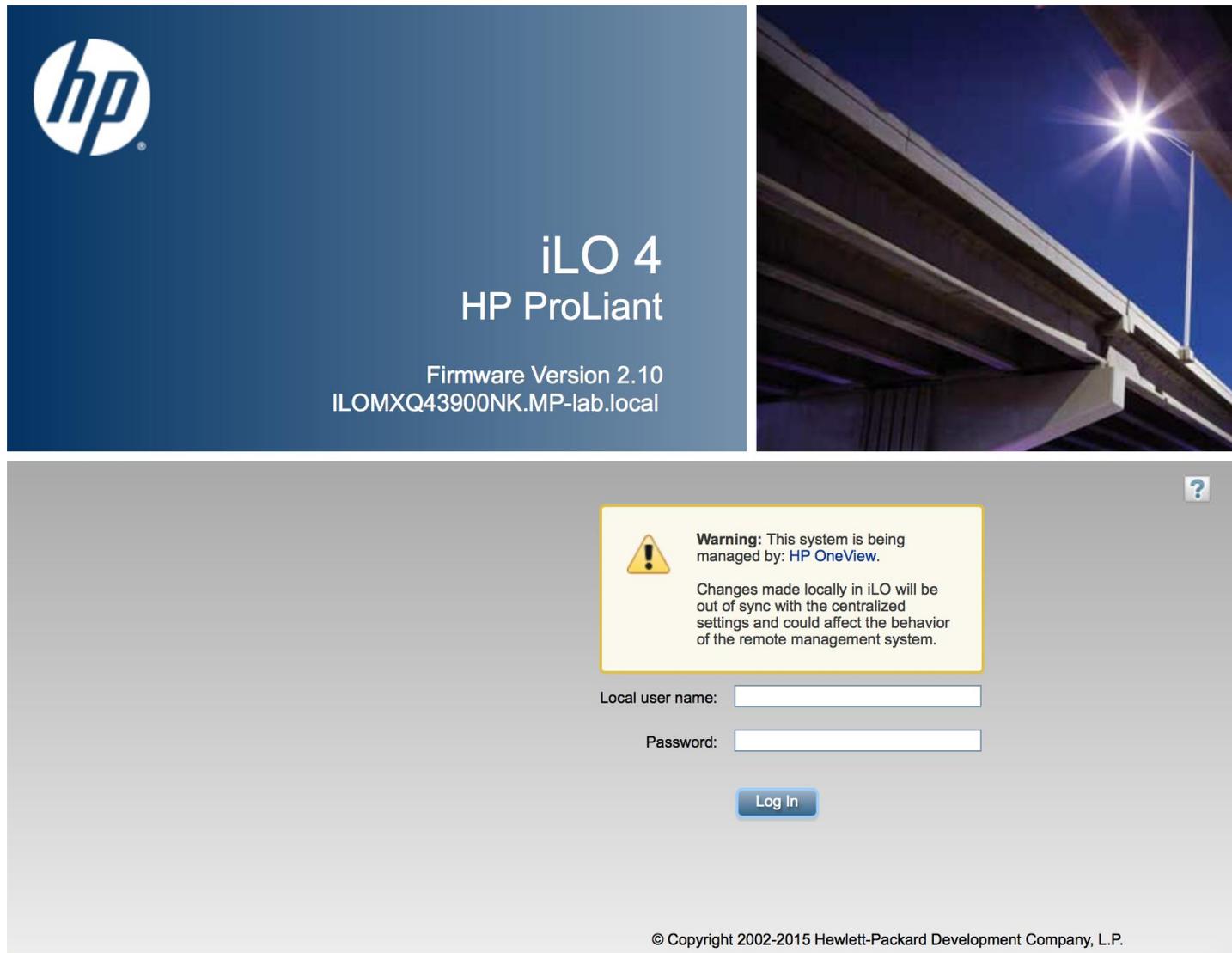
Figure 9: Configuration drift detection not supported in HP OneView.

Dell OpenManage Essentials (OME) made it easy to detect changes implemented at the local level. When settings were out-of-sync between the Dell OME templates and the iDRAC configuration, the OME Compliance Portal provided alerts with details on specific settings that were inconsistent.

When it came to deployment, **Dell OME also offered an automated deployment process that was not available from HP OneView.** By importing a .CSV document with a list of hardware service tags, Dell OME was able to automatically apply server templates and deploy operating systems to newly discovered hardware.

CONCLUSION

Using a systems management solution that streamlines and automates common data center operations is vital to the efficient operation of your data center and the continuous availability of your infrastructure. The right servers and systems management solution can actually provide your IT organization with dramatic savings and enable greater efficiency and productivity.

We carried out three typical data center use cases using a Dell PowerEdge R630 managed with Dell OpenManage Essentials and an HP ProLiant DL380 Gen9 managed with HP OneView. **We found that the Dell solution reduced IT administrator time by as much as 40 percent and provided incremental systems management benefits and features. It achieved this with the additional advantage that the cost of the Dell OpenManage Essentials systems management solution is 93 percent lower than the cost of the HP OneView systems management solution.**

Our conclusion: Dell OpenManage Essentials and PowerEdge servers can be excellent investments for your data center if you are interested in ease of use, cost and time savings, accuracy, and infrastructure availability.

APPENDIX A – SYSTEM CONFIGURATION INFORMATION

Figure 10 provides detailed information about the systems we used in our hands-on tests.

System	Dell PowerEdge R630	HP ProLiant DL380 Gen9
Power supplies		
Total number	2	2
Vendor and model number	Dell 09338DX03	HP 720479-B21
Wattage of each (W)	495	800
General		
Number of processor packages	2	2
Number of cores per processor	6	14
Number of hardware threads per core	2	2
System power management policy	Default	Default
CPU		
Vendor	Intel	Intel
Name	Xeon®	Xeon®
Model number	E5-2609 v3	E5-2695 v3
Stepping	M1	2
Socket type	LGA 2011-3	LGA 2011-3
Core frequency (GHz)	1.90	2.30
Bus frequency	6.4 GT/s QPI (3200 MHz)	9.6 GT/s QPI
L1 cache	32 KB + 32 KB (per core)	32 KB + 32 KB (per core)
L2 cache	256 KB (per core)	256 KB (per core)
L3 cache	15 MB	35 MB
Platform		
Vendor and model number	Dell PowerEdge R630	HP ProLiant DL360 Gen9
Motherboard model number	0CNCJW	775400-001
Memory module(s)		
Total RAM in system (GB)	16	16
Vendor and model number	Samsung® M393A1G43DB0-CPB	Samsung® M393A1G43DB0-CPB
Type	DDR4-2133 ECC	DDR4-2133 ECC
Speed (MHz)	2,133	2,133
Speed running in the system (MHz)	1,066	1,066
Timing/Latency (tCL-tRCD-tRP-tRASmin)	15-15-15-36	15-15-15-36
Size (GB)	8	8
Number of RAM module(s)	2	2
Chip organization	512Mb × 8	512Mb x 8
Rank	Dual	Dual
Disks		
Vendor and model number	Seagate ST300MM0006	HP EG0300FCSPH
Number of disks in system	2	2
Size (GB)	300	300

System	Dell PowerEdge R630	HP ProLiant DL380 Gen9
Type	HDD	HDD
Firmware	LS08	HPD0
Disk controller		
Vendor and model	Dell PERC H730P Mini	HP Smart HBA H240ar
Controller firmware	25.2.2-0004	2.14
Operating system		
Name	Microsoft Windows Server® 2012 R2 Datacenter	Microsoft Windows Server 2012 R2 Datacenter
Build number	9600	9600
File system	NTFS	NTFS
Kernel	NT	NT
Language	English	English

Figure 10: Detailed configuration information for the test systems.

APPENDIX B – DETAILED TEST METHODOLOGY

Installation and first-time setup	
Dell	**HP**
Creating the Windows Server VM *We used a Windows Server 2012 R2 gold image with slipstreamed updates and an unattended installation script for all of our Windows VMs. We uploaded this image file to a datastore accessible to our infrastructure vCenter Server.* 1. From the vSphere client, select the appropriate data center, right-click, and select New Virtual Machine… The Create New Virtual Machine Wizard will launch. 2. Leave the Typical configuration method selected, and click Next. 3. Enter the virtual machine name (WS2012 Dell OME). 4. Select the Inventory Location for the virtual machine. 5. Click Next. 6. At the Storage page, select the destination storage for the virtual machine files. 7. Click Next. 8. Leave Windows selected for the Guest Operation System definition, and change the version to correspond with the Windows Server image (Microsoft Windows Server 2012 (64-bit)). 9. Click Next. 10. Leave the default Network Connection parameters, and ensure NIC 1 has the correct Network selected (for our test, we selected the management VLAN network). 11. Click Next. 12. At the disk creation page, enter the Virtual disk size (for our test, we created a 300GB virtual disk). 13. Leave Thick Provision Lazy Zeroed selected, and click Next. 14. Review the Ready to Complete summary, and click Finish. 15. From the vSphere Client, right-click the newly created VM, hover over Power in the context menu, and select Power On. 16. Right-click the VM again, and select Open Console. 17. Click the CD and wrench icon, hover over CD/DVD drive 1, and select Connect to ISO image on local disk…	**Deploying HP OneView OVF** 1. From the vSphere Client, click File, Deploy OVF Template… 2. When the Deploy OVF Template wizard launches, click Browse…, navigate to the HP OneView OVA location (HP_OneView_1.20_ESXi_Z7550-01588.ova), and click Open. 3. Click Next. 4. Review the OVF Template Details, and click Next. 5. Name the HP OneView VM (HPOneViewTest), select the inventory location, and click Next. If you did not specify a Specific Host, at the next screen, select the Host, and click Next. 6. Select the destination storage for the virtual machine files, and click Next. 7. Select Thin Provision, and click Next. 8. Ensure the Destination Networks for the VM Network is set to the correct VLAN (for our test, we used our management VLAN), and click Next. 9. Review the Ready to Complete summary, check Power on after deployment, and click Finish. **Setting up HP OneView** *Continued from successful OVF deployment. Assumes the OneView VM has been powered on.* 1. From the vSphere Client, select the newly deployed appliance (HPOneView-NoSSH_1.20.01_21397), and click the Console tab. 2. Click Agree to accept the HP OneView licensing terms. 3. Click Disable to turn off Authorized services access. 4. Click OK. 5. At the HP OneView login screen, enter the default User and Password (Administrator/admin), and click Login. 6. Enter and confirm a new password for the Administrator (Password1), and click OK. 7. Enter the hostname (oneview.local). 8. At the Appliance Networking screen, enter the IPv4 address for the appliance (10.128.54.123). 9. Verify the Gateway address and Preferred DNS server (10.128.0.1 and 10.128.0.10) are correct,

Installation and first-time setup	
Dell	**HP**
18. Navigate to the Windows Server 2012 R2 image, select it, and click Open. 19. Press enter to boot from the newly connected installation media. Windows Server 2012 R2 unattended installation will begin. ## Installing Dell OME *To install Dell OpenManage Essentials, we created a Windows Server 2012 R2 VM on our infrastructure environment. This guide begins with vSphere Client in the Console of the Windows Server VM, logged into the Windows server, and with the installation media accessible from the host.* 1. Move the Dell OME installation media to a local directory on the new Windows Server 2012 R2 VM. 2. Open the Dell OME self-extracting zip archive (OpenManageEssentials_2_0_1_A00.exe). 3. Click Browse… to choose a location to unzip the installation media to, and click OK. 4. Click Unzip. 5. When the self-extraction completes, click OK. The Dell OpenManage Installer will launch automatically. 6. Leave Dell OpenManage Essentials checked and click Install. 7. At the critical prerequisites screen, click Install All Critical Prerequisites. 8. When the warning dialog appears, click Yes to continue installation of the critical prerequisites. 9. At the next prerequisites screen, click Install Essentials. 10. Click Yes to install Essentials on a local database. 11. At the next prerequisites screen, click Install Essentials again. 12. In the Dell OpenManage Essentials Install Wizard, click Next. 13. Accept the license agreement, and click Next. 14. Leave the Typical setup type selected, and click Next. 15. Review the installation settings, and click Install. 16. When the installation completes, leave Launch Dell OpenManage Essentials checked, and click Finish. 17. OpenManage Essentials will launch in Internet Explorer by default. If a recommended security and	leave the default Time and Language settings, and click OK. ## Deploying HP Insight Controller OVF 1. From the vSphere Client, click File, Deploy OVF Template. 2. When the Deploy OVF Template wizard launches, click Browse. 3. Navigate to the Insight Controller OVF, and select Open. 4. Select Next on the OVF Template Details screen. 5. Provide a name for the Virtual Machine, and select an inventory location. 6. Select Next. 7. On the Host/Cluster pane, select a host for the VM deployment. 8. Select Next. 9. On the Storage pane, select the storage location. 10. Select Next. 11. On the Disk Format pane, select Thick provisioned Eager Zeroed. 12. Select Next. 13. On the Network Mapping Pane, select the appropriate network for Insight Controller to use. 14. Select Next. 15. On the Ready to Complete pane, Select Finish. ## Setting up HP Insight Controller *Continued from successful OVF deployment. Assumes the OneView VM has been powered on.* 1. From the vSphere Client, select the newly deployed appliance (ICsp-vmware-7.4.0-20140914), and click the Console tab. 2. Click Agree to accept the HP Insight Control server provisioning License. 3. Click Disable to turn off Authorized services access. 4. Click OK. 5. At the HP Insight Control login screen, enter the default username and password, and click Login. 6. Enter and confirm a new password for the Administrator, and click OK. 7. At the Appliance Networking screen, expand the Appliance tree. 8. Enter a valid IPv4 address for the gateway address, the appliance IP address, and DNS servers. 9. Expand the Deployment tree.

Installation and first-time setup	
Dell	**HP**
compatibility settings warning appears, select Don't use recommended settings, and click OK. 18. Dell OME will have launched in Internet Explorer to the First Time Setup wizard. Click the X icon on the wizard window to close the wizard. **Configuring Dell OME deployment file share** 1. Click the Deployment tab. 2. Click File Share Settings. 3. Enter the Domain \ Username (for our test, we used localhost\Administrator). 4. Enter the Password (Password1). 5. Click Apply. 6. Click OK when the settings are applied successfully.	10. Enter a valid IPv4 address for the deployment IP address. 11. Leave the default time and language settings, and click OK. **Setting up HP Media Server** *Download the image file for Intelligent Provisioning. Ensure the media server has access a Windows Server 2012 R2 x64 ISO or CD/DVD.* 1. In Windows Server 2012 R2, launch Server Manager. 2. Select Add roles and features from the Dashboard. 3. Select Next on the Before You Begin pane. 4. Select Next on the Installation Type pane. 5. Select Next on the Server Selection pane. 6. Select Next on the Server Roles pane. 7. On the Features pane, select .Net Framework 3.5 Features. 8. When a dialog to add required features appears, select Add Features. 9. On the Features pane, select Next. 10. On the Confirmation pane, select Finish. 11. In a Web browser, navigate to the Insight Controller server provisioning Web client. 12. Select the top drop-down menu, and select Settings. 13. Select Edit, located next to Media Server. 14. Select the link Download HP Insight Control server provisioning Media Server setup utility. 15. When the HP Install Package window opens, click Run. 16. The Media Server setup utility will launch. At the Prerequisites screen, click Continue. 17. When the Browser For Folder window launches, navigate to the Local Disk and create a new folder to host the Media Server. For our test, we created a folder on C:\ named "hpmediaserver". 18. At the Select Components to Install screen, uncheck Select All, and only check HP Intelligent Provisioning, and Windows 2012 R2 x64 (EN-US). 19. Click Install. 20. At the Parameters screen, enter a name for the Windows File Share Name (hpmediaserver). 21. Enter an Authorized Windows User (Administrator). 22. Click Install.

Installation and first-time setup	
Dell	**HP**
	23. Mount the HP Intelligent Provisioning ISO (HPIP201.2014_0902.29) by right-clicking on the file, and selecting Mount. 24. The HP Intelligent Provisioning Setup window will launch. Click the browse icon next to IP location, navigate to the mounted HP Intelligent Provisioning Image, and click OK. 25. Click Install. 26. Click Close when the installation completes. 27. The Windows 2012 R2 x64 (EN-US) Setup window will launch. Mount the Windows Server 2012 R2 ISO by right-clicking and selecting Mount. 28. Select the browse icon next to the Distribution location, and select OK. 29. Click Install. 30. Click Close when the Windows Server installation completes. 31. Click Close on the still-open installation dialog. 32. Navigate back to the Web client for HP Insight Control server provisioning. 33. Select the top drop-down menu, and select Settings. 34. Select Edit, located next to Media Server. 35. Provide all Media Server information. 36. Select OK. **Connecting HP Insight Control server provisioning and HP OneView** 1. Navigate to the Web client for HP Insight Control server provisioning. 2. Select the top drop-down menu, and select HP OneView Appliances. 3. Select Add Appliance. 4. Fill in all required fields, and select Add. **Pre-deploying HP Insight Control server provisioning Windows Server Datacenter** 1. Navigate to the Web client for HP Insight Control server provisioning. 2. Select the top drop-down menu, and select Settings. 3. Select Edit, located next to Product Keys. 4. Select Create product key. 5. Select the Windows Server version, and provide the key. 6. Select Create.

Installation and first-time setup	
Dell	**HP**
	7. Select OK.
	8. Select the top drop-down menu, and select OS Build Plans.
	9. Select the out-of-the-box build plan: ProLiant OS – Windows 2012 R2 Standard x64 Scripted Install.
	10. Select the Actions drop-down, and select Save As.
	11. Name the Build Plan: ProLiant OS - Windows 2012 R2 Datacenter x64 Scripted Install
	12. Select Edit, located next to Steps.
	13. Select the gear icon for Step 1.
	14. Change the Parameters field to: --custAttrNames "ProductKey_Win2012R2-DC-x64"
	15. Select OK.
	16. Select the gear icon next to Step 13.
	17. Change the Configuration File to: Windows 2012 R2 DataCenter x64 en_us Unattend
	18. Select OK.
	19. Select OK.

Server rack, stack, and deploy	
Dell	**HP**
"Racking and stacking" the Dell PowerEdge R630 1. Rack the rails for the Dell PowerEdge R630. 2. Extend the rails, lift the server enclosure, and rack the Dell PowerEdge R630. 3. Plug in power for PSU 1 and 2. 4. Connect the management port to the infrastructure switch via RJ45. 5. Press the power button to power on the server. 6. When the front LCD panel stops displaying "System booting," click the checkmark button on the front panel, use the arrow keys to select View, and press the checkmark button again. Click the checkmark button three more times to view the iDRAC IP. **Dell OME server discovery** 1. Click the Manage tab. 2. Click the Discovery and Inventory subtab. 3. Click Add Discovery Range. 4. At the Discovery Range Configuration wizard, enter the IP address or IP address range for the Dell server (10.128.54.23). 5. Click Add. 6. Click Next. 7. Leave the default Timeout and Retries ICMP parameters, and click Next. 8. Uncheck Enable SNMP discovery and click the WS-Man Configuration link. 9. Check Enable WS-Man Discovery. 10. Enter the iDRAC User ID and Password for discovery (root/calvin). 11. Check Secure Mode, and check Trusted Site. 12. Click the Summary navigation link, and review the inputs. 13. Click Finish. **Applying the Dell OME Server Config Mgmt License** 1. From the Manage tab, click the Devices subtab. 2. In the Devices subtab, ensure All Devices is selected. Click the device to be licensed. 3. Click the link to Integrated Dell Remote Access Controller. 4. Log into the iDRAC with the default credentials (root/calvin).	**"Racking and stacking" the HP DL380** 1. Rack the rails for the HP DL380 Gen9 on each side of the rack. 2. Slide the HP DL380 into the rails. 3. Plug in the power to both PSUs. 4. Connect the iLO port to the correct network. 5. Connect any NDC NIC to the correct network. 6. Connect a monitor to the server's VGA port. 7. Power on the server by pressing the power button on the front chassis. 8. Watch the POST screen for the iLO IP address. **HP OneView server discovery** 1. Navigate to the Web client for HP OneView. 2. Select Server Hardware. 3. Select Add server hardware. 4. Provide the iLO IP address or host name, and select the bubble for Managed. The Menu should expand, and enter the iLO credentials, and select HP OneView Advanced w/o iLO, because the server to be managed already has iLO Advanced. 5. Select Add to complete server Discovery. **Configuring HP iLO License** 1. Navigate to the iLO of the server to be deployed. 2. Enter the correct credentials, and select Login. 3. Expand the Administration tree in the left menu, and select Licensing. 4. Enter the License Key, and select install. **HP Insight Control server provisioning Server Discovery** 1. Navigate to the Web client for HP Insight Control server provisioning. 2. Select Add server. 3. Provide the iLO IP address or host name, enter the iLO credentials, and check the box next to Do not boot to maintenance. 4. Select Add to complete server Discovery. **Creating the HP OneView Server Profile** 1. Navigate to the Web client for HP OneView. 2. Select the main drop-down menu in the upper left, and select Server Profiles. 3. Select Create profile.

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5. Assuming the iDRAC loads with the Server tree expanded, click the Licenses subtree item. 6. Under License Options, change Select… to Import. 7. Click Choose File and navigate to the license file location. Click OK. 8. Click Apply. 9. When the license is successfully imported, click OK. 10. Close the iDRAC window. ## Adding devices to the Dell OME Repurpose and Bare Metal Devices Group 1. From the Deployment tab, click Deployment Portal under Deploy Device Configuration Portal. 2. In the Repurpose and Bare Metal Devices tab, click Modify Devices. 3. In the Modify Devices of the Repurpose and Bare Metal Device Group window, expand the RAC tree, and select the Dell PowerEdge R630 for deployment (idrac-6TPMV12). 4. Click OK. The device will be added to the Repurpose and Bare Metal Devices group. ## Creating the Dell OME template 1. From the Deployment tab, click Create Template under Common Tasks. 2. In the Create Template Wizard, name the template (Test Deployment 1). 3. Leave Create from Device selected, and expand the RAC tree to select the discovered Dell PowerEdge R630 server (idrac-6TPMV12). 4. Under Execution Credentials, enter the iDRAC User Name and Password (root/calvin). 5. Click Finish. 6. Click OK to acknowledge the Create template task submission. ## Deploying the Dell OME template *This task assumes an OS image is reachable on the network from the OME Windows Server 2012 instance.* 1. From the Deployment tab, click Deploy Template under Common Tasks. 2. Name the Deployment (ESXi Test 1). 3. Leave Deploy Template selected, and check Boot to Network ISO. 4. Click Next.	4. Give the profile a useful name and description. Choose the previously added server. Select the correct firmware baseline, and check the box to Manage the BIOS. 5. Select Create. ## HP Insight Control server provisioning Deploying Windows Server 2012 R2 Datacenter 1. Navigate to the Web client for HP Insight Control server provisioning 2. Select the top drop-down menu, and select Servers. 3. Select Add server. 4. Provide the iLO IP address, and the iLO username and credentials. 5. Check the box next to Do not boot to maintenance. 6. Select Add. 7. Once the Job has finished, select the top drop-down menu, and select Servers. 8. Select the Actions drop-down, and select Run OS Build Plans. 9. Select Add. 10. Select the previously created Build Plan, ProLiant OS - Windows 2012 R2 Datacenter x64 Scripted Install, and select Add. 11. Leave the rest of the options at their default settings, and select OK.

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5. Click the Server Templates drop-down arrow, and select the template for deployment (Test Deployment 1). 6. Click Next. 7. Enter the ISO Filename for deployment (en_windows_server_2012_r2_x64_dvd_2707946.iso). 8. Under Share Location, enter the Share IP (10.128.15.31). 9. Enter the Share Name (windowsiso). 10. Under Share Credentials, enter the share username and password (Administrator \ Password1). 11. Click Next. 12. Expand the RAC tree and select the Dell PowerEdge R630 for deployment (idrac-6TPMV12). 13. Click Next. 14. Leave the default Device Specific Attributes selected for the server, and click Next. 15. Change the schedule to Run now. 16. Enter the Execution Credentials (root/calvin). 17. Click Next. 18. Review the summary, and click Finish. 19. At the Warning dialog, click Yes to proceed.	

Updating server firmware	
Dell	**HP**
Updating Dell OME server firmware	**Updating HP OneView firmware**
1. Click the Manage tab. 2. Click the System Update subtab. 3. Click the Non-Compliant Systems tab. 4. Check the topmost checkbox to select all non-compliant systems with available updates. 5. Click Apply Selected Updates. 6. Click OK to acknowledge any warnings or incompatibilities. 7. Change Task Schedule to Run now. 8. Enter the iDRAC User Name and Password (root/calvin). 9. Click Finish.	1. Navigate to the Web client for HP OneView. 2. Select the main drop-down menu in the upper left, and select Firmware Bundles. 3. Select Add Firmware Bundle. 4. Drag and drop the .ISO Service Pack from Proliant. These can be downloaded on the HP support Web site. When the upload completes, select Close. 5. Select the main drop-down menu in the upper left, and select Server Profiles. 6. Select the correct Server Profile from the left menu. 7. Select Edit to the right of Firmware on the Server Profile overview. 8. Choose the correct server firmware baseline, and choose to force compliance (the server will be downgraded if necessary). 9. Select OK.

ABOUT PRINCIPLED TECHNOLOGIES

Principled Technologies®

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