Make IT management easier and faster

with Dell™ Lifecycle Controller Integration for Microsoft® System Center Virtual Machine Manager

74% less time to execute four key management tasks*

System discovery

Server configuration Hyper-V deployment

Firmware updating

50% fewer steps

39% less time

96% less time

*Performing these tasks on a single Dell server versus HP server with OneView for Microsoft System Center. Savings grow more rapidly with more servers.

Automation reduces the chance of errors

Templates and automation would enable you to perform the 4 use cases on 100 servers in 6 minutes for Dell versus more than 2 hours for HP!

For IT staff, managing large numbers of virtualization hosts has the potential to require large amounts of time and effort. Using a systems management solution that automates tasks can allow IT staff to save time and steps, help reduce the possibility of human error, and free staff to work on other operations.

In the Principled Technologies datacenter, we compared the time and steps necessary to perform fundamental infrastructure management tasks within a Microsoft System Center environment utilizing two solutions designed for use with Microsoft System Center Virtual Machine Manager. One solution was Dell PowerEdge™ servers and Dell Lifecycle Controller Integration for Microsoft System Center Virtual Machine Manager and the other was HP ProLiant servers and OneView for Microsoft System Center. Because of its use of templates and automated processes, using the Dell solution to discover inventory, deploy and configure hardware, deploy Microsoft Hyper-V® to bare-metal servers, and update firmware on multiple servers required dramatically less time and fewer steps than performing the same tasks with the HP solution.

The greater the number of servers in your datacenter, the more time you could save by using PowerEdge servers and Dell Lifecycle Controller Integration for Microsoft System Center Virtual Machine Manager compared to the HP solution.

FASTER, EASIER TEMPLATE-DRIVEN MANAGEMENT WITH DELL LIFECYCLE CONTROLLER INTEGRATION FOR MICROSOFT SYSTEM CENTER VIRTUAL MACHINE MANAGER

In addition to saving IT administrator time by automating repetitive tasks, a high-quality management solution should provide consistency, reliability, and accuracy. To reduce time-to-productivity, solutions that integrate seamlessly with customers' existing solutions, skill sets, and processes assist in eliminating the many steps required to learn a new tool. It is also important to keep management topology simple by reducing, for example, the need for more networks or virtual machine infrastructure.

Dell Lifecycle Controller Integration (DLCI) for System Center Virtual Machine Manager is available as a Hyper-V virtual appliance that provides Virtual Machine Manager (VMM) with access to features and functionality embedded within Dell PowerEdge servers. The Dell solution is designed to reduce complexity in the datacenter with automated processes that easily provision bare-metal servers and ensure servers are configured and updated consistently and securely. According to Dell, DLCI for SCVMM provides hardware management for Dell PowerEdge rack servers and converged platforms including VRTX, M1000e blade servers, and FX2 systems. In this report, we tested the solutions on 1U rack servers.

The Dell Hyper-V virtual appliance enables Dell features within Virtual Machine Manager. While Microsoft System Center Virtual Machine Manager provides Hyper-V management, the Dell solution's agent-free architecture means Dell systems management capabilities are available independent of the operating system or hypervisor deployed on the server, which can greatly simplify management hardware within multi-vendor OS, hypervisor, and workload environments. For more information on DLCI for SCVMM, see Appendix A.

In our datacenter, we tested four resource-management use cases:

- Automated server discovery
- Server hardware configuration
- Deployment of Microsoft Windows Server® and Hyper-V to bare-metal compute nodes
- Updates of system firmware

We recorded the time and steps to complete each of the four use cases for Dell Lifecycle Controller Integration for SCVMM on two Dell PowerEdge R630 rack servers and the same four use cases for HP OneView for Microsoft System Center on two HP ProLiant DL360 Gen9 rack servers. We configured both solutions using the methods and best practices described in relevant, publically available documentation. For detailed configuration information on the test systems, see Appendix B. For detailed steps on how we tested, see Appendix C.

Microsoft System Center virtual environment comparison: Dell PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 2

OVERVIEW OF OUR FINDINGS

Performing the four use cases on a single server

Altogether, completing all the tasks in the four use cases using Dell Lifecycle Controller Integration for SCVMM on a single PowerEdge server took 74.6 percent less time than performing the same four use cases using HP OneView for System Center on a single HP ProLiant server—a little over 5 minutes versus more than 20 minutes. Figure 1 shows the time and number of steps needed to perform each use case on a single server.

Use case	DLCI for SCVMM		HP OneView for System Center	
	Time (mm:ss)	Steps	Time (mm:ss)	Steps
Discover bare-metal server	00:31	2	00:23	4
Apply/create Hardware Profiles	03:33	25	00:44	3
Deploy Hyper-V	00:43	7	06:21	8
Update firmware	00:26	4	12:55	17
Total for all use cases	**05:13**	**38**	**20:23**	**32**

Figure 1: Time and steps the two hardware management tools needed to complete the four use cases on a single server. Lower numbers are better.

The Dell solution required less time even though it required six more total steps than the HP solution. Additionally, the HP solution required the use of two separate tools and interfaces—we were able to perform three of the four use cases using HP OneView, but we needed SCVMM to deploy Microsoft Hyper-V.

Performing the four use cases on 100 servers

While the time that the Dell solution saved in our single-server scenario is certainly an advantage, datacenter administrators are typically responsible for managing dozens, if not hundreds of servers. Thanks to their use of templates and automation, the management tools available with the Dell Lifecycle Controller Integration (DLCI) for SCVMM solution deliver a great economy of scale that the HP OneView for System Center does not.

After we used each solution to carry out our four use cases on a single server, we repeated the processes on a second server, noting the time and number of steps necessary for the additional server.[1] Based on these findings, we calculated the time and steps that would be necessary to perform the use cases on 100 servers using each solution.

---

[1] The configuration for the second server was identical to the one we used on the first server. We base all of our time and steps projections for 100 servers on the configurations being the same.

Microsoft System Center virtual environment comparison: Dell PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 3

As Figure 2 illustrates, because the DLCI for SCVMM solution uses templates and automated processes that execute tasks on multiple servers simultaneously, performing our four management use cases on 100 Dell PowerEdge servers would take a total of 38 steps—the same number of steps needed for a single server. Even if we doubled or tripled the number of servers to 200 or 300, the DLCI for SCVMM solution would require the same 38 steps to complete the four use cases.

Figure 2: Performing the use cases on 100 servers using the Dell solution would take a tiny fraction of the steps compared to doing so using the HP management solution. Fewer steps are better.

Note: The Dell solution applies the Hardware Profile as a part of deploying Hyper-V, so it requires no additional steps.

Number of steps to perform use cases on 100 servers (including first server/initial setup)
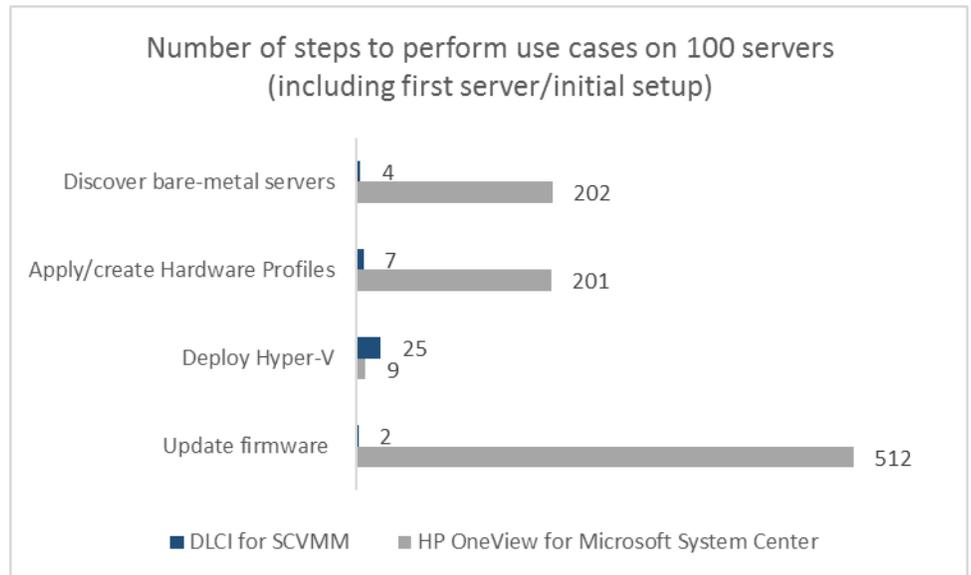
Because the HP solution does not use templates and lacks automated processes, using its management tools to carry out the four use cases on 100 HP ProLiant servers would take a whopping 924 steps. The many additional manual steps involved with the HP solution could introduce human error during the configuration of multiple servers. With the Dell solution, applying a single template to many servers reduces the potential for errors.

As the number of steps increases, so does the amount of time an IT administrator must spend carrying them out. Figure 3 shows the almost inconsequential time an administrator would need to perform our four management use cases on 100 servers using the Dell solution—less than 6 minutes total. Because the HP solution requires an IT administrator to repeat tasks for every one of the 100 servers, the time needed to do the jobs would grow to 2 hours and 32 minutes.

Microsoft System Center virtual environment comparison: Dell PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 4

Figure 3: Performing the use cases on 100 servers using the Dell solution would take a fraction of the time compared to doing so using the HP management solution. Less time is better.

Time to perform use cases on 100 servers

Use case	DLCI for SCVMM	HP OneView for Microsoft System Center
Discover bare-metal servers	00:26	52:24
Apply Hardware Profile	00:43	47:26
Deploy Hyper-V	03:33	06:25
Update firmware	00:31	46:09
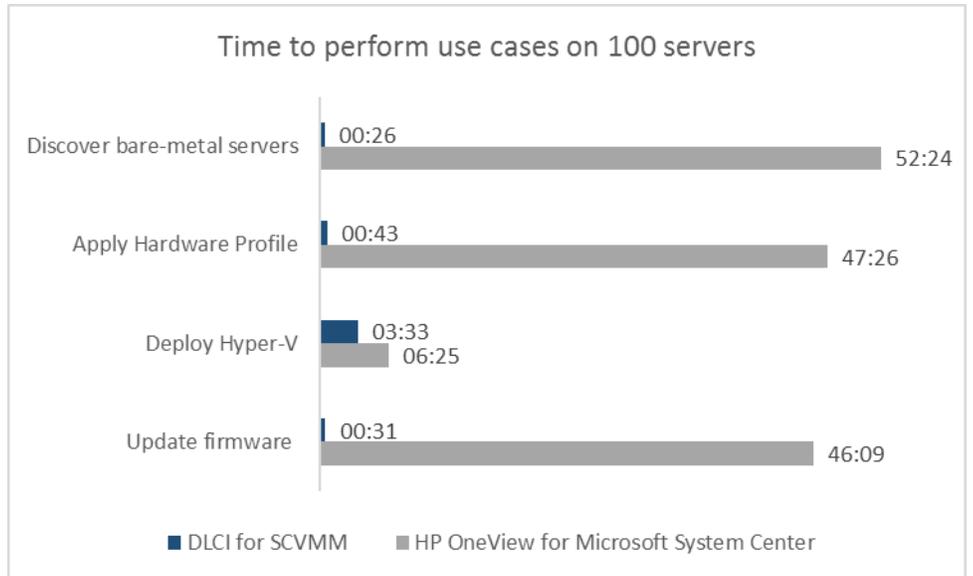
In the sections that follow, we present more detail about our four systems management use cases. In Appendix D, we present detailed test results.

OUR FINDINGS IN DETAIL

Faster server discovery

When new hardware arrives, it needs to move quickly to production in order to avoid any idle resources. Automated discovery allows IT staff to save time and simplifies the process of moving servers to production. Figure 4 shows the DLCI Discovery Wizard.

Figure 4: DLCI Discovery Wizard.

Microsoft System Center virtual environment comparison: Dell PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 5
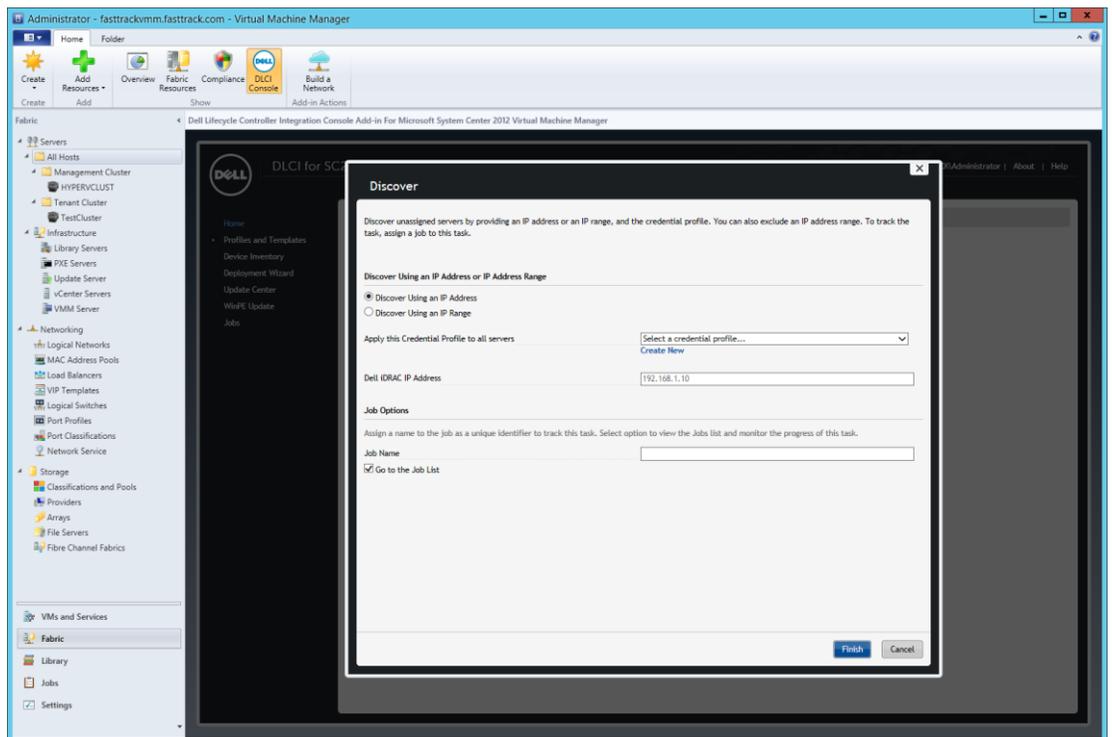
The initial discovery of two Dell PowerEdge rack server components with Dell Lifecycle Controller Integration was a fast, simple process compared to discovery with the HP OneView for System Center solution.

Using DCLI, performing this use case would take two steps and 31 seconds of IT admin time whether we were working on a single Dell server or 100 of them. In contrast, the four steps and 23 seconds necessary to carry out this use case on a single HP server would balloon to 202 steps and more than 52 minutes if we were to perform the tasks on 100 servers because of the lack of automation in the HP solution.

Faster hardware configuration

Configuring many servers manually can be time-consuming, so it is extremely useful when a management solution allows admins to perform these repeatable tasks in an automated fashion.

The Dell solution is template-driven, and uses a reference server to create a new template that supports application to any number of servers at once during deployment. Settings in the template also support robust editing, as Figure 5 shows. Dell has named their hardware configuration templates "Hardware Profiles."
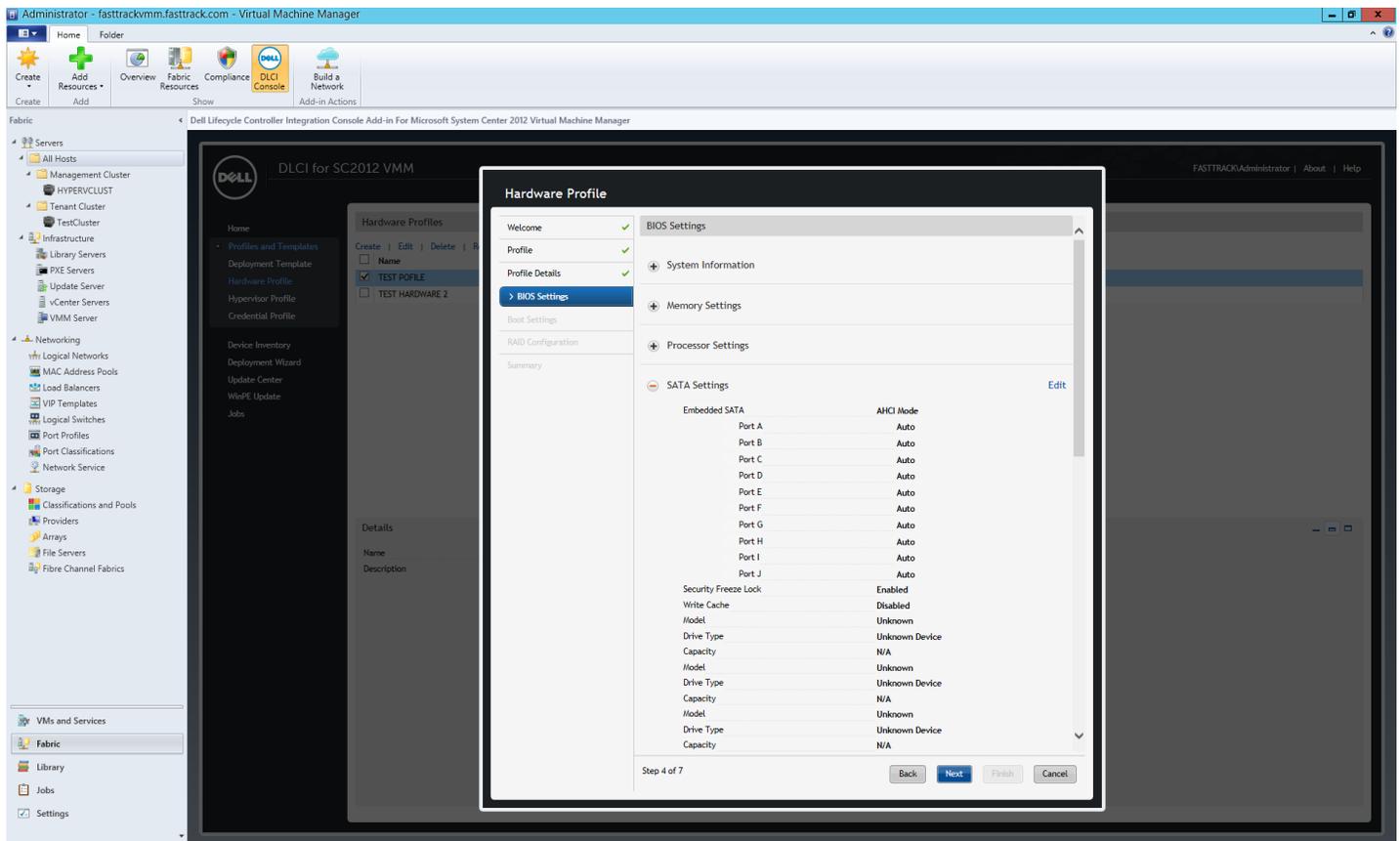
Figure 5: DLCI Hardware Profile Editing.

Microsoft System Center virtual environment comparison: Dell PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 6

During the configuration of HP servers, HP OneView allows the user to create or copy Server Profiles to each individual server. Server Profiles contain settings on the firmware baselines and BIOS and boot order settings. While Server Profiles allow creation without a physical server, unassigned profiles must be assigned at a later time in a separate process to each server.

Using DCLI, performing this use case would take 25 steps and 3 minutes 33 seconds of IT admin time whether we were working on a single Dell server or 100 of them. In contrast, the three steps and 44 seconds necessary to carry out this use case on a single HP server would balloon to 201 steps and more than 47 minutes if we were to perform the tasks on 100 servers because of the lack of automation in the HP solution.

Faster deployment of Hyper-V to a bare-metal node

When running a virtualized datacenter, bare-metal hosts are provisioned in a repeatable pattern—starting with the installation of a hypervisor. In this case, hosts are provisioned with Microsoft Hyper-V, included with Microsoft Windows Server® 2012 R2.

Dell Lifecycle Controller Integration for Microsoft System Center Virtual Machine Manager helps to automate the installation of Microsoft Windows Server, including Hyper-V, to bare-metal servers. Using the DLCI plug-in and Virtual Machine Manager, IT administrators can deploy the Hyper-V hypervisor onto a single node or onto multiple nodes simultaneously (see Figure 6).

Microsoft System Center virtual environment comparison: Dell PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 7
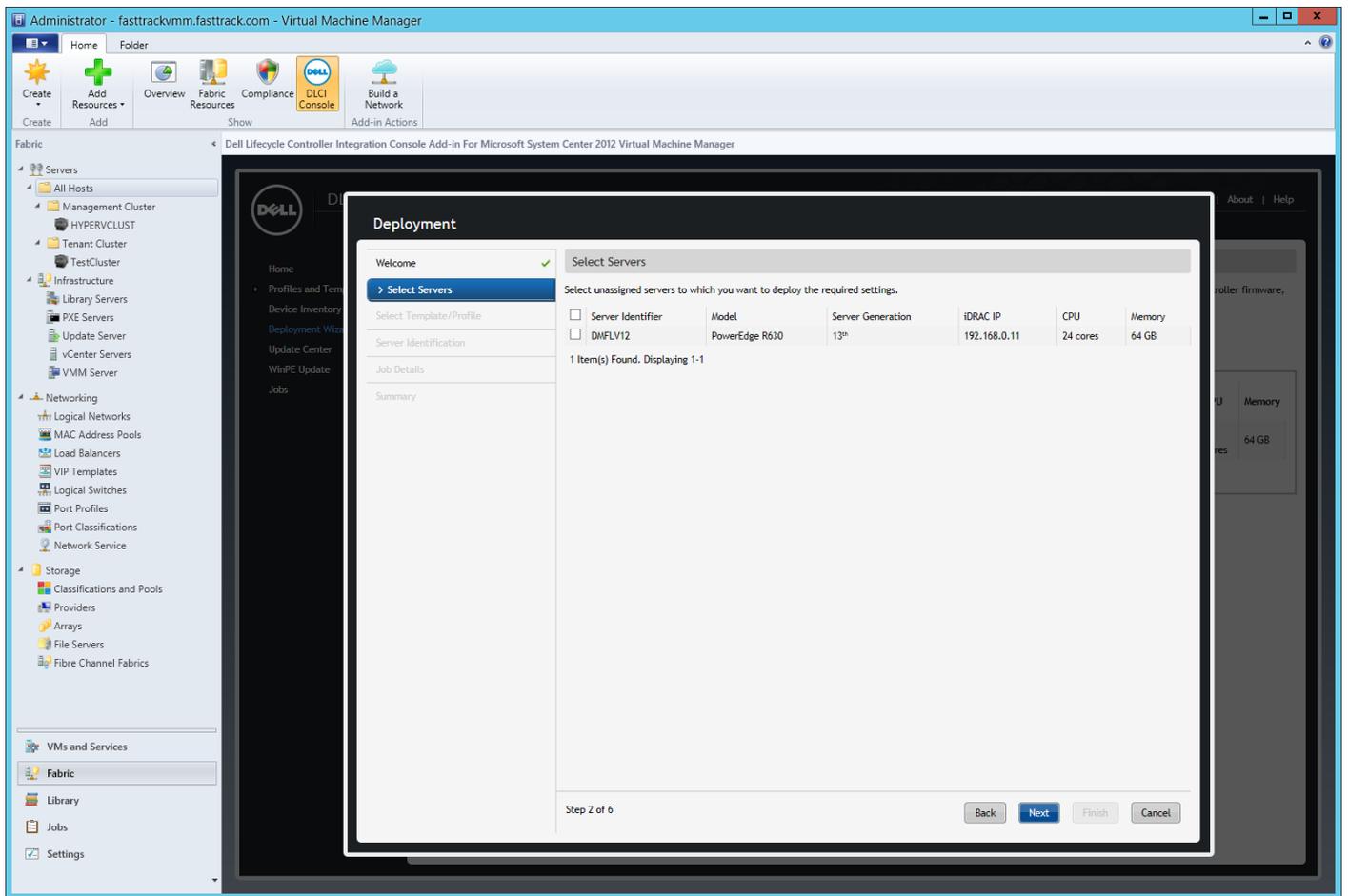
Figure 6: DLCI bare-metal deployment.

The HP OneView licensing includes rights to use the HP ProLiant SCVMM Integration Kit, which helps to create a Microsoft Windows® PE image that contains necessary HP drivers for the greatest compatibility with HP hardware. Using Microsoft SCVMM 2012 R2, users can deploy a prepared image of Microsoft Windows Server and the customized HP image.

Applying the hardware profile and deploying Microsoft Hyper-V utilizing Dell Lifecycle Controller Integration would take only seven steps and 43 seconds of IT admin time regardless of the number of servers administered, whereas the HP solution would require nine steps and more than 6 minutes of IT admin time to deploy Hyper-V to the same number of servers. Combined with template creation/application, deploying Hyper-V on the first server using the Dell solution took 39 percent less time than the HP solution (see Figure 7).

Microsoft System Center virtual environment comparison: Dell
PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 8

Figure 7 : Creating and applying a template and deploying Hyper-V on a single server took less time with the Dell solution.
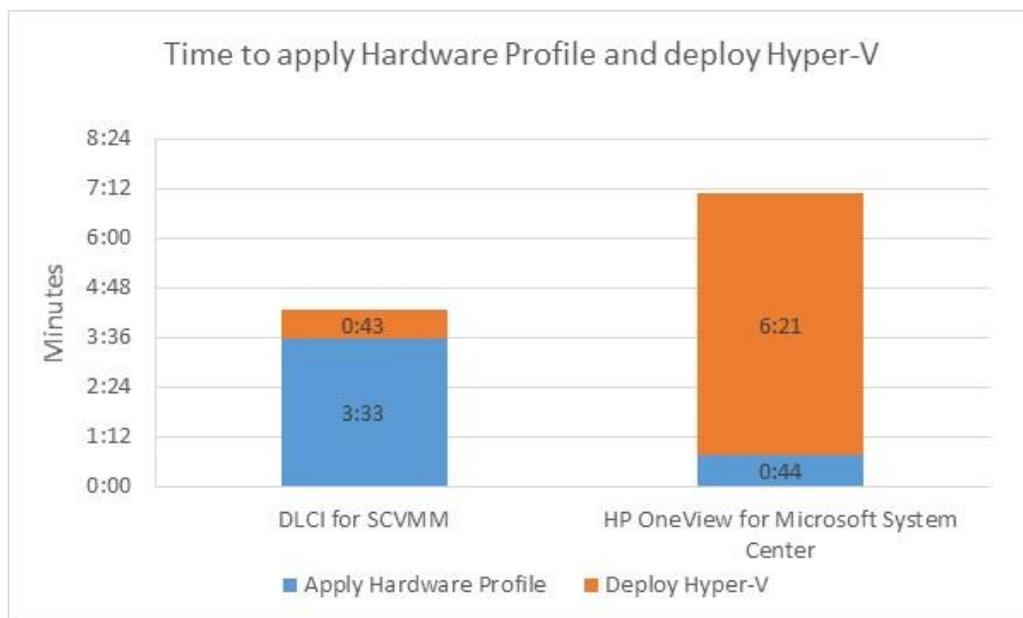
Faster updates and firmware management

Firmware updates for servers can patch critical flaws, enable more features, and increase security. By ensuring servers use up-to-date firmware, manufacturers can better support and maintain compatibility with new software, hardware add-ons, or other features.

Dell provides a feature in DLCI for SCVMM called Update Center, which allows users to view update compliance per server and push individual updates to components (see Figure 8). Updates can be scheduled or applied immediately, to reduce the need for reboots during critical business hours. The Dell solution also downloads firmware updates automatically from Dell, although users also have the option to maintain an internal firmware repository. Additionally, the Dell solution can also update system firmware during Hyper-V deployment, while the HP solution must do so in a separate process.

Microsoft System Center virtual environment comparison: Dell
PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 9
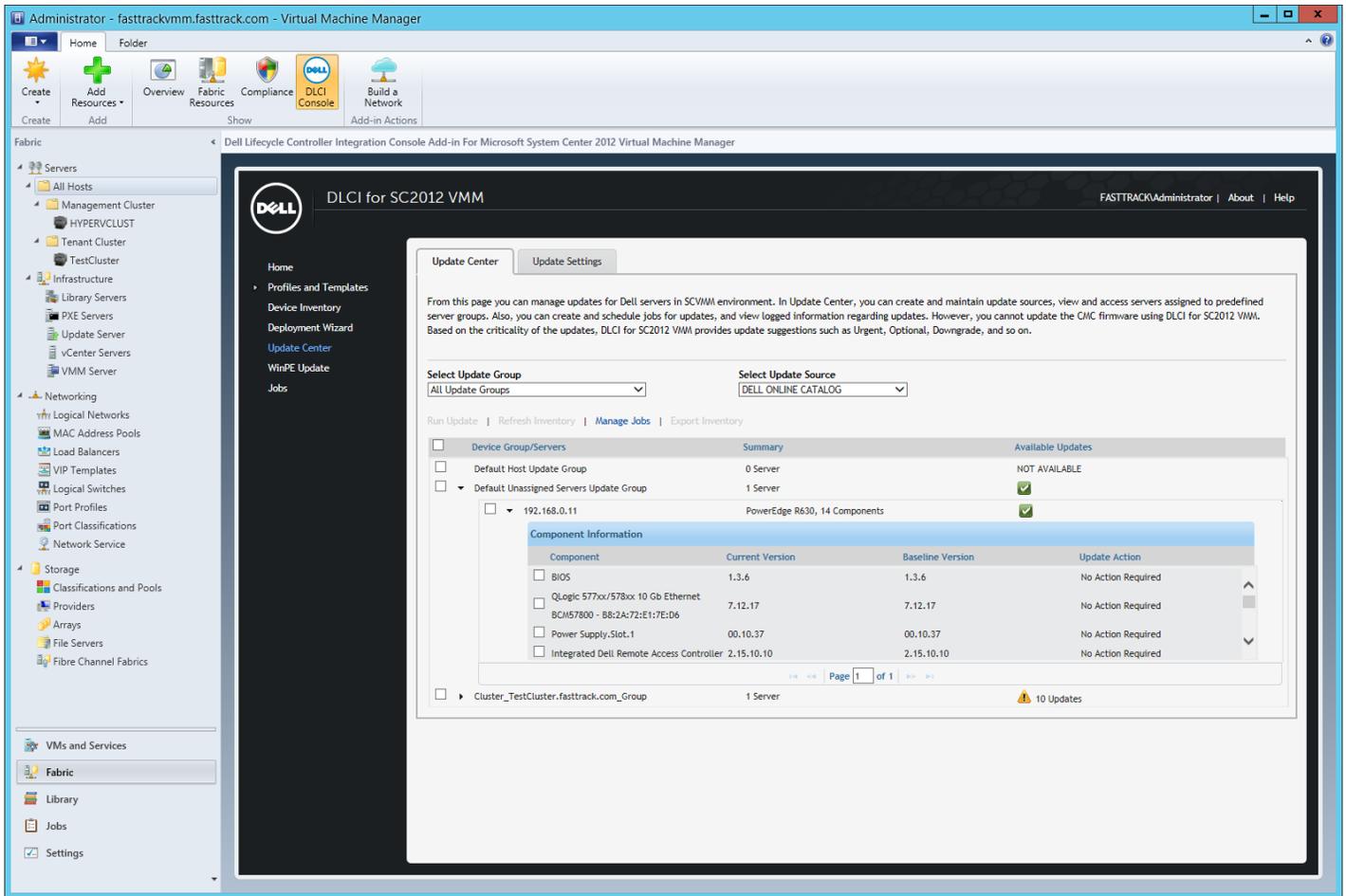
Figure 8: DLCI Firmware Update Center.

Microsoft System Center virtual environment comparison: Dell
PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 10

HP OneView requires monolithic update packages uploaded to the OneView appliance. These are available from HP's website. The latest updates are applied to the server upon the creation or edit of a server profile, and the server must be powered off to apply server profile changes. Figure 9 shows a screenshot of HP Firmware Bundles.
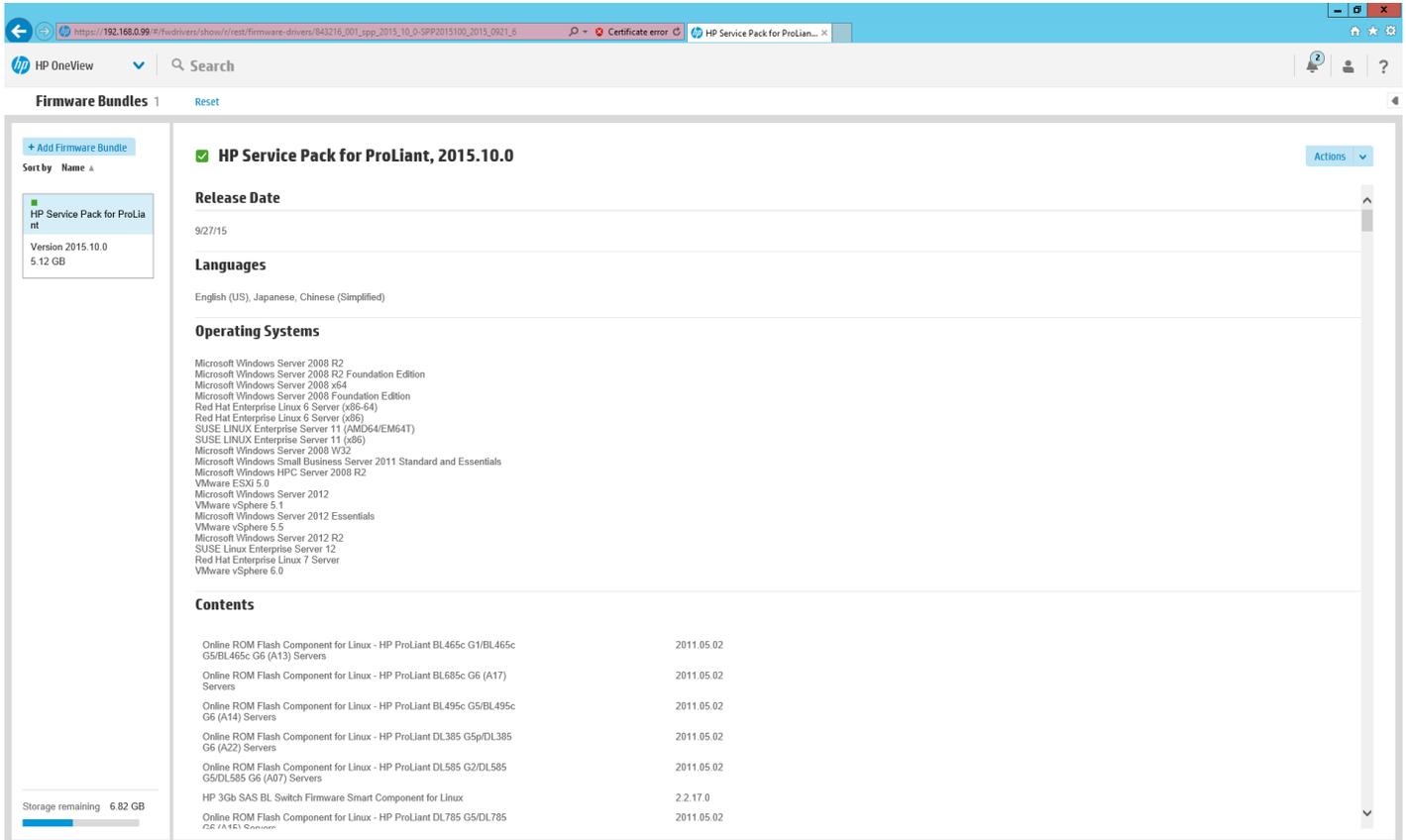
Figure 9: HP Firmware Bundles.

Using Dell Lifecycle Controller Integration (DLCI), performing this use case would take 4 steps and 26 seconds of IT admin time whether working on a single Dell server or 100 of them. In contrast, the 17 steps and 12 minutes 55 seconds necessary to carry out this use case on a single HP server would balloon to 512 steps and more than 40 minutes if we were to perform the same tasks on 100 servers due to the lack of automation in the HP solution.

CONCLUSION

When repetitive and admin-intensive management tasks are quicker and easier to complete, that's a win for your datacenter and IT administrators. We found that using Dell Lifecycle Controller Integration for SCVMM took 74.6 percent less time to complete four key server management use cases on a single server, compared to performing the same use cases with HP OneView for System Center. When managing many servers, data extrapolated to 100 servers from testing on a second server shows the Dell solution

Microsoft System Center virtual environment comparison: Dell PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 11

would take 95.8 percent fewer steps and 96.5 percent less time than the HP solution. Dell Lifecycle Controller Integration for Microsoft System Center Virtual Machine Manager also enabled IT admins to perform all of the server management operations through a single console—and staged firmware updates without necessitating a server power-down. Easier to use and less time-intensive, the results of our testing showed that the DLCI for SCVMM and Microsoft System Center Virtual Machine Manager can be a more efficient and effective combination for your virtualized datacenter.

Microsoft System Center virtual environment comparison: Dell PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 12

APPENDIX A – ABOUT THE COMPONENTS

About Microsoft System Center Virtual Machine Manager

Part of the larger collection of Microsoft System Center consoles, Microsoft System Center Virtual Machine Manger 2012 R2 enables the management of many facets of virtualized computing, such as host management and deployment. Additional features include deploying software updates from Microsoft to hosts, virtual networking components, and support for a number of third-party add-ins. SCVMM 2012 R2 includes many features for virtual workload management, such as template-driven deployments, robust support for multiple hypervisors, and support for storage management. The latest version used in this study, Microsoft SCVMM 2012 R2, was released in 2013. For more information on Microsoft System Center Virtual Machine Manager 2012 R2, see technet.microsoft.com/en-us/library/gg610610.aspx.

About Dell Lifecycle Controller Integration for System Center Virtual Machine Manager

DLCI for SCVMM is available as a virtual hard drive (VHD) from Dell, ready for import into Hyper-V or Virtual Machine Manager. Upon deployment, the main DLCI appliance provides a web interface that provides installation wizards to deploy the other components of DLCI and to manage the appliance itself. The DLCI appliance is built on the popular Linux® distribution CentOS. Using the Dell Lifecycle Controller Integration for SCVMM plug-in , the Dell solution enables IT admins to use a single console to perform server firmware updates, deployment and discovery, and also view firmware compliance information. For more information, see en.community.dell.com/techcenter/systems-management/dlci-vmm/.

About HP OneView and HP OneView for Microsoft System Center

HP OneView is a virtual appliance available for deployment on a Hyper-V or VMware® vSphere®-based platform. It includes features such as storage management, server utilization and health status, and monolithic firmware updates. Additional features include per-server profiles, the ability to manage HP Virtual Connect modules, and simple configuration. While the HP OneView appliance does not include OS or hypervisor deployment tools, the licensing structure of HP OneView includes the right to use all HP OneView Partner Integrations such as the HP OneView for Microsoft System Center used in this study to enable features such as OS deployment. For more information, see www8.hp.com/us/en/business-solutions/converged-systems/oneview.html.

Microsoft System Center virtual environment comparison: Dell
PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 13

APPENDIX B – SYSTEM CONFIGURATION INFORMATION

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

System	Dell PowerEdge R630 (×2)	HP ProLiant DL360 Gen9 (×2)
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	18
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	E5-2699 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	45 MB
Platform		
Vendor and model number	Dell PowerEdge R630	HP ProLiant DL360 Gen9
Motherboard model number	0CNCJW	775400-001
BIOS Version	1.3.6	P89 v1.50 (07/20/2015)
iDRAC/iLO Version	2.15.10.10	2.30 Aug 19 2015
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 × 8
Rank	Dual	Dual

Microsoft System Center virtual environment comparison: Dell
PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 14

System	Dell PowerEdge R630 (×2)	HP ProLiant DL360 Gen9 (×2)
Disks		
Vendor and model number	Seagate® ST300MM0006	HP EG0300FCSPH
Number of disks in system	2	2
Size (GB)	300	300
Type	HDD	HDD
Firmware	LS08	HPD0
Disk controller		
Vendor and model	Dell PERC H730P Mini	HP Smart HBA H240ar
Controller firmware	25.3.0.0016	3.00

Figure 10: Detailed configuration information for the test systems.

Microsoft System Center virtual environment comparison: Dell
PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 15

APPENDIX C – HOW WE TESTED

Installing Microsoft System Center Virtual Machine Manager

First, install the prerequisites for System Center Virtual Machine Manager. This includes a Microsoft SQL Server and an available Domain Server. A breakdown of system requirements and prerequisites is available at technet.microsoft.com/library/dn771747.aspx. Two components from the Windows ADK are necessary for the installation of Virtual Machine Manager. Both the Deployment Tools and Windows Preinstallation Environment must be installed. In the below guide for Windows ADK, the package has been previously downloaded for an offline installation according to technet.microsoft.com/en-us/library/dn621908.aspx.

1. Launch the ADK installer, and click Next.
2. Select the default installation directory or change it, and click Next.
3. Choose either option for the CEIP. Click Next.
4. Accept the License Agreement.
5. Select both the Deployment Tools and the Windows Preinstallation Environment (Windows PE). Click Install.
6. Wait for the install to finish, and click Close.
7. Launch the Virtual Machine Manager installer.
8. Click Install.
9. Select VMM management server, and click Next.
10. Enter all correct registration information, and click Next.
11. At the next screen, accept the license agreement, and click Next.
12. Select either option for the Customer Experience Improvement Program, and click Next.
13. Select either option for Microsoft Update, and click Next.
14. Select the installation directory. The default directory is fine. Click Next.
15. Enter the database information. Enter the SQL server name for server name, and the correct SQL credentials (if using Windows authentication, don't check the box). Select New database.
16. Create a VMMUser domain account in the Active Directory server. Ensure the VMMUser account has local administrator rights on both VMM01 and VMM01, and sysadmin rights on the SQL server or SQL cluster. Create a container for distributed key management in the AD DC Server. Instructions are available at technet.microsoft.com/en-us/library/gg697604.aspx.
    See technet.microsoft.com/en-us/library/cc739265(v=ws.10).aspx to ensure the user is a local administrator. Enter the credentials and information into this screen, and click Next.
17. If the default settings for port configuration are correct, proceed to the next screen by clicking Next.
18. Wait for installation to complete, and click Close.

Microsoft System Center virtual environment comparison: Dell
PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 16

HP ONEVIEW

Step counts for the HP solution assume the user is already at the HP OneView home screen, or starting after the steps Navigating to the HP OneView web console. Step counts for using the built-in SCVMM 2012 R2 Hyper-V deployment assume the user has already launched and signed into the SCVMM console.

Navigating to the HP OneView web console

1. Launch a web browser. For this test, we used Mozilla® Firefox® 41.0.1.
2. Navigate to the hostname or IP address of the HP OneView appliance.
3. Enter the correct credentials for the appliance, and click Login.

Creating iLO Run-As Account in SCVMM 2012 R2

This assumes the SCVMM 2012 R2 Console is already running.

1. From the left-hand VMM menu, click Settings.
2. Click Create Run-As Account.
3. Provide a credential name and description. Provide the correct iLO credentials, and unselect the Validate domain credentials. Click Finish.

Discovering a bare-metal server with HP One View

Discovering a server

1. Click the HP OneView dropdown in the upper-left, and click Server Hardware.
2. Click Add server hardware.
3. Provide the iLO IP address of the server, and select Managed.
4. Provide the iLO credentials on the menu that appears, and select the radio button for HP OneView w/o iLO. Click Add.

Discovering an additional server (additional steps when deploying more than one server at once)

If more than one server is to be discovered, follow the steps for Discovering the server, but in step 4, click Add+ instead of Add.

1. Provide the iLO IP address of the server, and select Managed.
2. Provide the iLO credentials on the menu that appears, and select the radio button for HP OneView w/o iLO. Click Add.

Applying/creating Hardware Profiles with HP OneView

Creating the server profile

1. Click the HP OneView dropdown in the upper left, and click Server Profiles.
2. Click Create profile.
3. Enter a name, description, and select a previously added server. Select a firmware baseline from the drop-down, and select the box for Manage boot mode. Select Legacy BIOS from the drop-down, and ensure PXE boot is the first option. Select the Manage BIOS checkbox. Click Create.

Creating the profile for an additional server (additional steps when deploying more than one server at once)

If more than one server is to be configured, follow the steps for Creating the server profile, and then follow these steps.

1. Click the Actions drop-down, and select Copy.

Microsoft System Center virtual environment comparison: Dell PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 17

2. Provide a new profile name, and select another previously discovered server. Select Create.

Deploying Hyper-V with HP OneView

Deploying Hyper-V (one server)

This assumes the SCVMM 2012 R2 Console is already running.

1. In SCVMM, navigate to either the Fabric or VMs and Services tabs.
2. Right-click on All Hosts. Click Add Hyper-V Hosts and Clusters.
3. Select the radio button for Physical Computers to be provisioned as virtual machine hosts. Click Next.
4. Click browse. Choose the iLO Run-As account, and click OK. Click Next.
5. Provide the IP address of the iLO and click Next.
6. Ensure the correct Host group and Physical computer profile are selected, and click Next.
7. After deep discovery completes, provide a computer Name, and configure the NICs and networking options. Click Next.
8. Review all the information, and click Finish.

Deploying Hyper-V (two or more servers)

1. In SCVMM, navigate to either the Fabric or VMs and Services tabs.
2. Right-click on All Hosts. Click Add Hyper-V Hosts and Clusters.
3. Select the radio button for Physical Computers to be provisioned as virtual machine hosts. Click Next.
4. Click browse. Choose the iLO Run-As account, and click OK. Click Next.
5. Click the radio button for IP range. Enter in the correct IP range. Click Next.
6. Wait for initial IPMI discovery to finish. Select the checkboxes next to the desired servers, and uncheck the Skip deep discovery for selected computers checkbox. Click Next.
7. Ensure the correct Host group and Physical computer profile are selected, and click Next.
8. After deep discovery completes, provide a computer Name and configure the NICs and networking options for each discovered physical computer. Click Next.
9. Review all the information, and click Finish.

Updating firmware with HP OneView

Updating firmware (one server)

1. Navigate to h17007.www1.hp.com/us/en/enterprise/servers/products/service_pack/spp/index.aspx in a web browser.
2. Under Full ISO Image, select the link to download the HP Service Pack for ProLiant. The file is roughly 5GB.
3. On the next page, select Obtain Software.
4. Select Sign-in Now on the prompt that appears.
5. Sign in with an HP account that has rights to download the HP SPP.
6. Select Obtain Software.
7. Click Select.
8. Fill out the form, and click Next.
9. Choose either the HP Download Manager or Standard download, and select Download.
10. Once the file download completes, navigate to the web portal for HP OneView.

Microsoft System Center virtual environment comparison: Dell
PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 18

11. From the top left drop down menu, select Firmware Bundles.

12. Select Add Firmware Bundle.

13. Select Choose file and navigate to the HP Service Pack for ProLiant ISO.

14. Select Start Upload. When the upload completes, click OK.

15. Click the HP OneView main drop-down and click Server Profiles.

16. Select the profile that needs the update, and select the Actions drop-down. Click Edit.

17. Change the firmware baseline to the previously uploaded image. Click OK.

Editing the profile – Change firmware baseline (additional steps when deploying more than one server at once)

1. Click the HP OneView dropdown in the upper left, and click Server Profiles.

2. Select the server profile to edit from the left menu.

3. Click the Actions drop-down menu and click Edit.

4. From the firmware baseline drop-down, select a new firmware baseline.

5. Click OK.

DELL LIFECYCLE CONTROLLER INTEGRATION FOR SCVMM

Step counts for DLCI assume the user has already launched the SCVMM console and is at the DLCI console within SCVMM (see the steps Navigating to the DLCI Console in SCVMM).

Navigating to the DLCI Console in SCVMM

1. Launch the System Center Virtual Machine Manager 2012 R2 console.

2. Provide the correct server name, and click Connect.

3. Navigate to the Fabric tab on the left-hand menu.

4. Click the All Hosts folder.

5. In the ribbon menu, click DLCI Console.

6. Click Continue to this website.

Discovering a server by IP range with Dell Lifecycle Controller Integration

1. From the Home menu of the DLCI console, click Discover Unassigned Servers.

2. Click the radio button for Discover Using an IP Range, select the correct credentials for the iDRACs, and enter both the start IP Range and Ending Range. Optionally, provide a job name you can use to identify the task. Click Finish.

Applying/creating Hardware Profiles with Dell Lifecycle Controller Integration

Creating credentials

1. From the Home menu of the DLCI console, click Profiles & Templates from the left-hand menu. A menu will then expand.

2. Click Credential Profile.

3. Click Create.

4. Select a Credential Profile Type (Device Credential Profile) and provide a useful name and description. Enter the username, password, and select iDRAC. Click Finish.

Creating Hypervisor Profile

1. From the Home menu of the DLCI Console, select Create Hypervisor Profile.

Microsoft System Center virtual environment comparison: Dell PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 19

2. Click Next.

3. Provide the profile with a name and description. Click Next.

4. Select All Hosts & a preexisting SCVMM Physical Computer Profile. Click Next.

5. Provide the WinPE ISO name. Click Next.

6. Click the box to enable Dell Lifecycle Controller Drivers Injection. Select WS2012R2. Click Next.

7. Click Finish.

Creating Deployment Template

1. From the Home menu of the DLCI Console, select Profiles and Templates from the left-hand menu. A menu will then expand.

2. Click Deployment Template.

3. Click Create.

4. Provide the template with a useful name and description. Select the previously created hardware profile, hypervisor profile, and use the update source DELL ONLINE CATALOG. Check the box Continue OSD even if firmware deployment fails. Click Finish.

Configuring server – Hardware profile creation from a reference server

1. From the Home menu of the DLCI Console, click Profiles & Templates from the left-hand menu. A menu will expand.

2. Click Hardware Profile.

3. Click Create.

4. Click Next.

5. Provide a hardware profile name, description, and a reference server. Click Next.

6. Leave Dedicated Hot Spare at the Default setting, and leave all checkboxes at their default setting. Click Next.

7. Wait for the profile to be created and review all BIOS settings when they appear. Click Next.

8. Verify Boot settings. Click Next.

9. Verify RAID configuration. Click Next.

10. Check that the summary is correct, and select Finish.

Deploying Hyper-V with Dell Lifecycle Controller Integration

Note: This step also applies the hardware profile.

1. From the left menu of the DLCI Console, select Deployment Wizard.

2. Click Next.

3. Check boxes for the servers to deploy. Click Next.

4. Select the Deployment Template, and select the iDRAC credentials. Click Next.

5. Provide the server(s) with a hostname and leave the other settings at their default. Click Next.

6. Provide a Job name and description. Click Next.

7. Verify all settings, and click Finish to deploy all hardware settings, updates, and install Hyper-V.

Updating firmware with Dell Lifecycle Controller Integration

1. From the Home menu of the DLCI Console, select Update Center.

2. Check the server(s) to be updated – individual updates can be deselected or selected as desired.

Microsoft System Center virtual environment comparison: Dell
PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 20

3. Click Run Update.
4. Provide a Firmware Update Job Name and Description. Select Agent-free Update to push updates immediately. The option to schedule updates is also available. Click Finish.

Microsoft System Center virtual environment comparison: Dell
PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 21

APPENDIX D – DETAILED TEST RESULTS AND EXTRAPOLATION

Figure 11 presents detailed test results. For both the one-server and two-server sections, we include the one-time setup cost of profile creation (Dell) and firmware downloads (HP).

In Figure 12, we take our results from Figure 11 and extrapolate them to 100 servers. For all Dell processes, there is no difference in the amount of time required to perform the use cases on one or multiple servers. For HP, deploying Hyper-V requires the same time and steps for two or more servers, but discovery, hardware profile application, and firmware updates require additional time and steps for each additional server. To extrapolate 100 servers for the HP data, we multiplied the time and steps required for an additional server by 99, and then added the time and steps required for the first server.

	Dell Lifecycle Controller Integration (DLCI)		HP OneView		DLCI percentage decrease	
	Time (h:mm:ss)	Steps	Time (h:mm:ss)	Steps	Time	Steps
Deploying the first server (One-time setup tasks included)						
Discover bare-metal server	0:00:31	2	0:00:23	4	-34.78%	50.00%
Apply/create Hardware Profiles	0:03:33	25	0:00:44	3	-384.09%	-733.33%
Deploy Hyper-V	0:00:43	7	0:06:21	8	88.71%	12.50%
Subtotal of Hardware Profiles and Hyper-V deployment	*0:04:16*	*32*	*0:07:05*	*11*	*39.76%*	*-190.1%*
Update firmware	0:00:26	4	0:12:55	17	96.65%	76.47%
Total for all steps	**0:05:13**	**38**	**0:20:23**	**32**	**74.59%**	**-18.75%**
Deploying two servers at once (One-time setup tasks included)						
Discover bare-metal server	0:00:31	2	0:00:55	6	43.64%	66.67%
Apply/create Hardware Profiles	0:03:33	25	0:01:12	5	-196.77%	-400.00%
Deploy Hyper-V	0:00:43	7	0:06:33	9	89.06%	22.22%
Subtotal of Hardware Profiles and Hyper-V deployment	*0:04:16*	*32*	*0:07:45*	*14*	*44.95%*	*-128.57%*
Update firmware	0:00:26	4	0:13:16	22	96.73%	81.82%
Total	**0:05:13**	**38**	**0:21:56**	**42**	**76.16%**	**9.52%**

Figure 11: Time and steps required to perform four management use cases in our datacenter using the two management tools. Fewer steps and less time is better.

Microsoft System Center virtual environment comparison: Dell PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 22

	DLCI		HP OneView		DLCI percentage decrease	
	Time (h:mm:ss)	Steps	Time (h:mm:ss)	Steps	Time	Steps
100 servers (includes setup)						
Discover bare-metal server	0:00:31	2	0:52:24	202	99.01%	99.01%
Apply/create Hardware Profiles	0:03:33	25	0:47:26	201	92.52%	87.56%
Deploy Hyper-V	0:00:43	7	0:06:25	9	88.76%	22.22%
Subtotal of Hardware Profiles and Hyper-V deployment	*0:04:16*	*32*	*0:53:51*	*210*	*92.08%*	*84.76%*
Update firmware	0:00:26	4	0:46:09	512	99.06%	99.22%
Total	**0:05:13**	**38**	**2:32:24**	**924**	**96.57%**	**95.89%**

Figure 12: Projected time and steps that would be required to perform four management use cases using the two management tools, based on the results in Figure 11. Fewer steps and less time is better.

ABOUT PRINCIPLED TECHNOLOGIES

![Principled Technologies logo]

Principled Technologies, Inc.
1007 Slater Road, Suite 300
Durham, NC, 27703
www.principledtechnologies.com

We provide industry-leading technology assessment and fact-based marketing services. We bring to every assignment extensive experience with and expertise in all aspects of technology testing and analysis, from researching new technologies, to developing new methodologies, to testing with existing and new tools.

When the assessment is complete, we know how to present the results to a broad range of target audiences. We provide our clients with the materials they need, from market-focused data to use in their own collateral to custom sales aids, such as test reports, performance assessments, and white papers. Every document reflects the results of our trusted independent analysis.

We provide customized services that focus on our clients' individual requirements. Whether the technology involves hardware, software, websites, or services, we offer the experience, expertise, and tools to help our clients assess how it will fare against its competition, its performance, its market readiness, and its quality and reliability.

Our founders, Mark L. Van Name and Bill Catchings, have worked together in technology assessment for over 20 years. As journalists, they published over a thousand articles on a wide array of technology subjects. They created and led the Ziff-Davis Benchmark Operation, which developed such industry-standard benchmarks as Ziff Davis Media's Winstone and WebBench. They founded and led eTesting Labs, and after the acquisition of that company by Lionbridge Technologies were the head and CTO of VeriTest.

Microsoft System Center virtual environment comparison: Dell PowerEdge servers and Lifecycle Controller Integration vs. HP solution

A Principled Technologies report 24