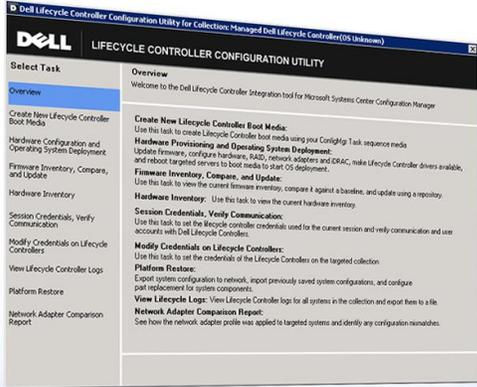


CENTRALIZED SYSTEMS MANAGEMENT: DELL LIFECYCLE CONTROLLER INTEGRATION FOR SCCM VS. HP PROLIANT INTEGRATION KIT FOR SCCM

DELL LIFECYCLE CONTROLLER INTEGRATION FOR SCCM



UP TO 87% LESS
ADMINISTRATIVE HANDS-ON TIME
UPDATING FIRMWARE

MORE THAN 2x FASTER
WINDOWS OS DEPLOYMENTS

in our tests versus HP ProLiant
SCCM 2007 Integration Kit



Efficient management of IT assets is critical for any business. One of the largest impacts you can make on your IT operational costs is through efficiency improvements and driving down your operational labor costs. Streamlining necessary but repetitive management tasks, such as system discovery, operating system deployment, and firmware updates saves time and frees resources for more strategic tasks. Many OEM solutions on the market allow administrators to perform these common system management functions, but which solution provides the best integration with Microsoft System Center Configuration Manager (SCCM)? How do you determine which integrated systems management solution offers the most streamlined and efficient methods? To answer these questions, we analyzed the capabilities of the Dell Lifecycle Controller Integration (DLCI) for Microsoft SCCM to manage Dell PowerEdge servers, as compared to the HP ProLiant Integration Kit for SCCM managing HP ProLiant Servers.

Our findings show that the Dell Lifecycle Controller Integration for SCCM provided processes requiring 87 percent less hands-on administrator interaction to deploy firmware updates than those of HP ProLiant Integration Kit for SCCM. By leveraging the embedded management features of the Lifecycle Controller 2 and Integrated Dell Remote Access Controller 7 (iDRAC7), rather than relying on a traditional PXE network boot, the Dell Lifecycle Controller Integration solution allowed administrators to deploy operating systems more than two times faster than HP ProLiant Integration Kit, with 80 percent less hands-on time required.

Increased automation and reduced administrative overhead for management tasks allows systems administrators to perform routine operations more quickly, enabling better adherence to maintenance windows and decreasing platform downtime. This can ultimately reduce administrative costs and free resources normally designated to maintenance tasks for reallocation to innovate new IT initiatives.



A PRINCIPLED TECHNOLOGIES TEST REPORT

Commissioned by Dell Inc., October 2012

DELL LIFECYCLE CONTROLLER 2 AND DELL SCCM INTEGRATION SIMPLIFIES SYSTEMS MANAGEMENT

Lifecycle Controller 2 and Dell Lifecycle Controller Integration

The ability to perform common tasks, such as operating system deployment and firmware upgrades from a centralized management console is an enormous advantage of any hardware-software partnership. Microsoft SCCM is an established systems management product containing an interface administrators use to perform configuration management tasks for their infrastructure. Dell provides the Dell Lifecycle Controller Integration for SCCM, a powerful tool to simplify and streamline systems management of Dell infrastructure. Firmware upgrades can be deployed to servers running Microsoft or non-Microsoft operating systems, or no operating system at all. New operating system deployments can occur, hardware profiles can be configured, and more.

Dell Lifecycle Controller Integration for SCCM communicates directly with the heart of 12th generation Dell PowerEdge servers' embedded systems management—the Dell Lifecycle Controller 2. Working in conjunction with the Integrated Dell Remote Access Controller 7, Lifecycle Controller receives and implements instructions from the Dell Lifecycle Controller Integration to configure systems.

In our tests, we compared Dell Lifecycle Controller Integration for SCCM to the ProLiant Integration Kit for SCCM in two scenarios: deployment of Microsoft Windows Server 2008 R2 and updating firmware from within the Microsoft SCCM 2007 console. Though our target system ran Microsoft Windows Server during the firmware update, Dell Lifecycle Controller Integration for SCCM enables firmware updates to machines running other operating systems as well. Our results showed Dell's solution decreased the amount of time necessary—both hands-on administrator time as well as total time—to deploy Microsoft Windows Server 2008 R2 and upgrade firmware, all from within the centralized SCCM console.

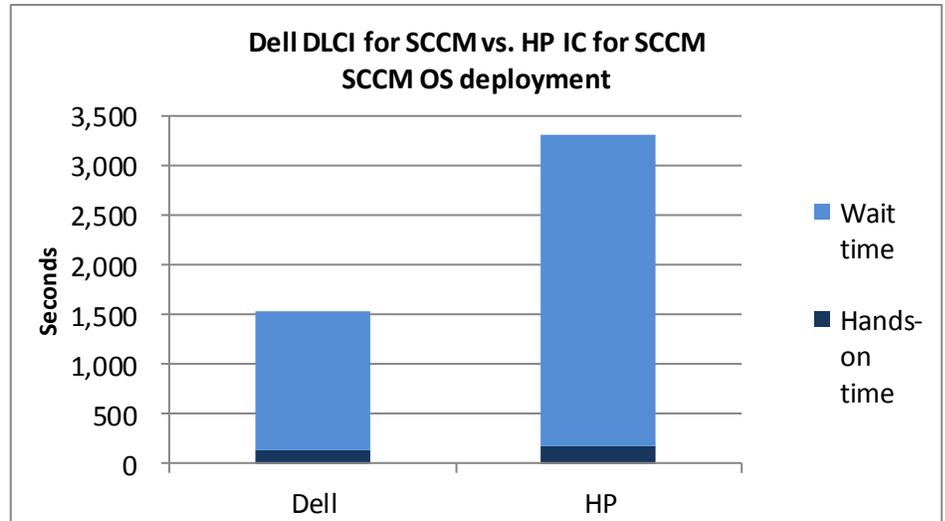
WHAT WE FOUND

Dell Lifecycle Controller Integration with SCCM deployed the OS 2.3 times faster than HP ProLiant Integration Kit for SCCM 2007, with 80 percent less hands-on time

The Dell Lifecycle Controller Integration for SCCM 2007 completed an OS deployment 2.3 times faster than the HP ProLiant Integration Kit for SCCM 2007. Using the Dell solution required 80 percent less administrative hands-on time (see Figures 1 and 2). Because the Dell Lifecycle Controller Integration solution utilizes the embedded systems management capabilities of the Dell Lifecycle Controller, it did not require a PXE environment for OS deployments, while the HP ProLiant SCCM 2007 Integration Kit

required the availability of the SCCM 2007 PXE component in order to perform similar deployments. Often these separate PXE infrastructures are quarantined from production environments, creating the costly need for yet more hardware.

Figure 1: Dell Lifecycle Controller Integration for SCCM performed faster Windows operating systems deployments in our tests versus HP ProLiant Integration Kit for SCCM 2007.



SCCM Windows operating system deployments	Hands-on time	Wait time	Total time
Dell Lifecycle Controller Integration (DLCI)	35	1,407	1,442
HP ProLiant Integration Kit for SCCM 2007	178	3,143	3,321

Figure 2: Hands-on and wait time to deploy operating systems with the two management solutions. All times are in seconds.

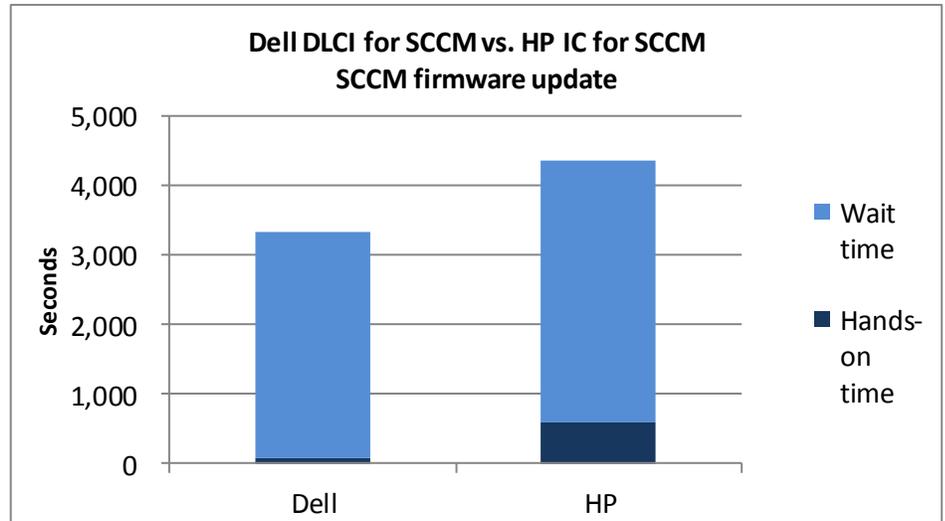
We categorized the time into two types, hands-on time and wait time. Hands-on time was the time required to perform required interactive steps such as UI navigation, mouse clicks, and data entry. Wait time was a significant time block during which the administrator must wait for the server to complete a task. In this testing, the wait time was at the end of the hands-on process, meaning the administrator was free to move on to other tasks when their hands-on tasks were complete.

Dell Lifecycle Controller Integration with SCCM deployed firmware updates with 87 percent less hands-on time required than HP solutions for SCCM 2007

The Dell Lifecycle Controller Integration for SCCM 2007 deployed firmware updates 1.3 times faster with 87 percent less administrator time than the process recommended in HP documentation for deploying firmware updates in SCCM 2007 using the HP Update Catalog. Because the Dell Lifecycle Controller Integration solution utilizes the embedded systems management capabilities of the Dell Lifecycle Controller, no operating system is required to perform firmware updates, enabling administrators to use Dell Lifecycle Controller Integration for SCCM in a mixed operating system/hypervisor environment. The HP solution relied on the SCCM client to perform

firmware updates, which required an active Microsoft Windows operating system to receive advertisements, thereby limiting the functionality to Microsoft Windows systems only.

Figure 3: Dell Lifecycle Controller Integration for SCCM completed firmware updates faster, and with less administrative effort than the HP solutions for SCCM 2007.



SCCM Firmware Updates	Hands-on time	Wait time	Total time
Dell Lifecycle Controller Integration (DLCI)	76	3,264	3,340
HP ProLiant Integration Kit for SCCM 2007	580	3,798	4,378

Figure 4: Hands-on and wait time to deploy firmware updates with the two management solutions. All times are in seconds.

DELL LIFECYCLE CONTROLLER INTEGRATION FEATURES

Simplicity and manageability – OS deployments

Dell’s systems management integration used approaches that allow operators high degrees of control in deployment operations. For example, Dell designed their integration to utilize the power of the embedded management processor, allowing administrators to push operating system installations and updates to target servers without the relying on the native services provided by SCCM, which requires a PXE server for OS deployments and the SCCM ConfigMgr client on managed operating systems that periodically “checks-in” to receive updates.

The Dell solution did not require a PXE environment to deploy operating systems. This is important because often organizations require additional infrastructure purposed specifically for these specialized deployment networks, which are isolated from their production network. By leveraging the embedded systems management capabilities of the Lifecycle Controller 2 and iDRAC, Dell eliminates this extra need for additional infrastructure.

The Dell Lifecycle Controller Integration for SCCM can deploy firmware to servers without an operating system, enabling an administrator to bring un-deployed servers to a production baseline level before installing an operating system, while the HP ProLiant SCCM 2007 Integration Kit requires not only the operating system but also the SCCM agent to be installed. The HP ProLiant Integration Kit does not contain mechanisms for performing server firmware updates directly, and HP recommends using the HP Service Pack for ProLiant DVD for updating infrastructure firmware.¹

	Dell Lifecycle Controller Integration	HP ProLiant Integration Kit for SCCM 2007
Deploy Windows Server OS	✓	✓
Automatic discovery of targets	✓	Manual process required
No PXE server required	✓	PXE required
Agentless Deployment	✓	Requires ConfigMgr client
Automated firmware deployment	✓	Manual process required
Deploy Linux or VMware OS	DLCI version 2.0 ²	N/A

Figure 3: Dell Lifecycle Controller Integration for SCCM provides a rich administrative feature set.

Simplicity and manageability – Firmware updates

Dell Lifecycle Controller Integration for SCCM performs agent-free firmware updates using the embedded Lifecycle Controller 2 capabilities on Dell PowerEdge 12th-generation servers. You can choose to deploy firmware from Dell Repository Manager, network-based shares, or Dell’s FTP server. This flexibility allows an administrator to easily choose between the latest updates available or making selections based on a policy such as “revision n-1” where “n” is the current release. For revision flexibility, HP, on the other hand, would require multiple sets of physical media along with extra script work. Having a unified repository reduces redundancy and inconsistency in your environment.

Unlike Dell Lifecycle Controller Integration, HP ProLiant SCCM 2007 Integration Kit does not directly perform firmware updates, and does not contain the mechanisms for doing so. Instead, HP separately provides the HP Update Catalog, which contains all the application files and updates necessary to perform infrastructure server updates. In the HP Update Catalog user guide,³ HP describes a manual method for creating firmware deployment packages in SCCM. An administrator uses these packages to create advertisements for managed servers, which then execute the firmware updates within their Windows operating systems. This manual process involves exporting the files

¹ HP Update Catalog (2012.06.0) User Guide: <http://h10032.www1.hp.com/ctg/Manual/c03381523.pdf>.

² According to Dell, version 2.0 deploys multiple operating systems via DLCI for SCCM. For this report, we tested version 1.3.

³ *Ibid.*

contained within the catalog to a folder on the SCCM server, creating a script that defines which updates should occur and in what manner, and then creating advertisements within SCCM and assigning them to collections that contain target servers. This is in contrast to Dell Lifecycle Controller for SCCM, which communicates directly with Lifecycle Controller to provide update capabilities to servers running any operating system.

WHAT WE TESTED

Our test configuration

Our test environment for each solution included a Microsoft Windows 2008 R2 SP1 server for Active Directory, DNS, and DHCP; a Microsoft Windows 2008 R2 server with Microsoft System Center Configuration Manager (SCCM) 2007 R3 installed; and the physical servers targeted for management. We configured each target server for remote access using its dedicated management interfaces—iDRAC7 for the Dell PowerEdge R720xd and iLO4 for the HP ProLiant DL380p Gen8.

About Microsoft System Center Configuration Manager, Dell Lifecycle Controller Integration, and the Dell Server Deployment Pack

The Dell Lifecycle Controller Integration for Microsoft System Center Configuration Manager (SCCM) 2007 R3, along with the Dell Server Deployment Pack, allows administrators to utilize the remote deployment and management capabilities of Dell servers directly from the Microsoft SCCM 2007 console, removing the reliance on a separate PXE infrastructure when deploying operating systems, and providing a streamlined interface for firmware deployments.

To learn more about Dell Lifecycle Controller Integration (DLCI), visit <http://en.community.dell.com/techcenter/systems-management/w/wiki/dlci-demos.aspx>

About iDRAC7 and the Dell Lifecycle Controller

Using the iDRAC7 and the Dell Lifecycle Controller allow simplified management of both local and remote servers. Embedded management features are directly on the server, and reduce reliance on external tools and media. The overall result of this centralized management location is a reduction in steps, time, and potential errors, as well as an increase in efficiency, when managing your servers.

To learn more about the Dell Lifecycle Controller, visit <http://en.community.dell.com/techcenter/systems-management/w/wiki/lifecycle-controller.aspx>. To learn more about iDRAC7, visit <http://www.dell.com/us/enterprise/p/d/solutions/integrated-dell-remote-access-controller-idrac>.

CONCLUSION

This paper focuses on the Dell Lifecycle Controller Integration for Microsoft System Center Configuration Manager working in conjunction with the embedded iDRAC with Lifecycle Controller 2 technology to provide centralized management of 12G servers. Leveraging the power of the Lifecycle Controller 2, Dell Lifecycle Controller Integration for SCCM made server management simpler and faster in our test scenarios. In our tests, using Dell Lifecycle Controller Integration saved time and required fewer steps when compared to using similar HP SCCM 2007 integration solutions. Dell's approach can potentially offer an organization dramatic savings in time and effort over the server lifecycle.

APPENDIX A – DETAILED TEST RESULTS

Our target server for performing Dell server firmware updates and Windows server OS deployments was a Dell PowerEdge R720xd containing two 147GB hard drives configured as a RAID 1 array, 64 GB of RAM, and two Intel Xeon E5-2660 processors. We licensed the iDRAC7 with an Enterprise iDRAC license, configured it to use its own dedicated interface, and assigned it a static IP address. The Lifecycle Controller utilized LOM1 for network access, and we assigned it a static IP address. Both addresses resided on a private network dedicated to Dell testing, with Internet access via a gateway. We used Dell Lifecycle Controller Integration for SCCM 2007 with Microsoft System Center Configuration Manager 2007 R3 to perform Windows Server 2008 R2 operating system deployments and firmware update testing.

Our HP target server for performing Windows Server OS deployments and firmware updates was an HP ProLiant DL380p Gen8, containing two 146GB hard drives configured as a RAID 1 array, 64 GB of RAM, and two Intel Xeon E5-2680 processors. We used an iLO Advanced license for the iLO4 and configured it with a static IP address. The address resided on a private network dedicated to HP testing, with Internet access via a gateway. We used the HP ProLiant SCCM 2007 Integration Kit (2012.06.0) with Microsoft System Center Configuration Manager 2007 R3 for deploying Windows Server 2008 R2 operating systems. For firmware updates, we utilized the HP Updates Catalog (2012.06.0).

For both target servers, we accepted firmware and application versions available prior to September 4, 2012.

Windows Server 2008 R2 deployments using SCCM 2007

These procedures assume discovery has already been completed, task sequences have been configured to define operating system installation parameters, and advertisements have been created and assigned to collections containing target servers.

Dell Lifecycle Controller Integration for SCCM 2007 7 steps (24 min, 2 sec)	HP ProLiant SCCM 2007 Integration Kit 3 steps (55 min, 21 sec)
<ol style="list-style-type: none">1. In SCCM, browse to the target server and select it.2. Select Dell Lifecycle Controller on the Actions panel.3. Launch Config Utility.4. Select Hardware Configuration and Operating System Deployment.5. On the following five screens, accept defaults (do not update any firmware or configure hardware).6. Select the advertisement and relevant operating system from the drop-down menus. Click Next.7. Provide the path and share credentials for the Network Boot ISO, and click Reboot Targeted Collection.	<ol style="list-style-type: none">1. Boot the target server.2. Wait for the prompt to press F12 to select Network Boot. Press F12 to select Network Boot.3. Ensure target server receives PXE server confirmation and task execution begins.

Firmware updates using Microsoft SCCM 2007

Dell firmware updates using Microsoft SCCM 2007 8 steps (55 min, 40 sec)	HP firmware updates using Microsoft SCCM 2007 38 steps (1 hr, 12 min, 58 sec)
<ol style="list-style-type: none"> 1. In SCCM, browse to the target server and right-click. 2. Select Dell Lifecycle Controller → Launch System Viewer. 3. Enter the Lifecycle Controller Authentication Information and click OK. 4. Select Firmware Inventory, Compare, and Update. 5. Click Next. 6. Define baseline selection by choosing from Local Repository, ftp.dell.com, or Firmware Inventory Profile. We selected Local Repository, and entered the URL for the CIFS repository and domain credentials used to access the share. Click Next. 7. The system displays a comparison of current firmware versions versus available versions. Click Next. 8. Click Update to begin. A notification of Task Submission Complete will appear. Double-click Dell Lifecycle Controller Task Viewer in the notification area of the task bar to view the status of the updates. 	<ol style="list-style-type: none"> 1. Create a new folder on the SCCM server named C:\HPSUM. 2. Share folder with “Everyone.” 3. Insert the HP SPP disc into optical drive. 4. Copy everything from <optical drive>:\hp\swpackages as well as any newer firmware files (CP*.EXE) into the newly created folder. 5. Using Notepad, create a file in the new folder and save it as <code>install.cmd</code>. 6. Add the following command lines: <pre style="margin-left: 40px;">pushd %~dp0 hpsum /f:rom /e /silent /allow_non_bundle_components /use_latest /romonly if errorlevel 4 exit 1 if errorlevel 3 exit 0 if errorlevel 2 exit 1 if errorlevel 1 exit 0 if errorlevel 0 exit 0 exit 1</pre> 7. Save the file and Exit. 8. Launch the SCCM console. 9. Expand Computer Management → Software Distribution. 10. Right click on Packages and choose Distribute → Software. Click Next. 11. Select Create a new package and program without a definition file. Click Next. 12. Enter identification information and click Next. 13. Choose Always obtain files from a source directory, and click Next. 14. Enter the Path of the share you created to house your updates, and click Next.

Dell firmware updates using Microsoft SCCM 2007 8 steps (55 min, 40 sec)	HP firmware updates using Microsoft SCCM 2007 38 steps (1 hr, 12 min, 58 sec)
	<ol style="list-style-type: none"> 15. Select your distribution point to copy the package to. The package does not have to be copied to the PXE point. 16. Enter the program identification information. In the command line field, type <code>install.cmd</code> or the name of the <code>.cmd</code> program you created in Notepad. Click Next. 17. Define the program properties. Select Program can run whether or not a user is logged on, and check the box for Allow users to interact with this program. On the pull-down menu for After running, select the entry for ConfigMgr restarts the computer, and click Next. 18. On the Advertise Program panel, select No, and click next. 19. On the Summary panel, review the summary, and click Next 20. On the Confirmation panel, click Close. 21. Expand Computer Management → Software Distribution → Packages. 22. Advertise the program by right-clicking on the newly created package. 23. Select Distribute → Software. 24. The Distribute Package Wizard opens. Click Next. 25. On the Distribution Points panel, click Next. 26. On the Advertise Program panel, select Yes, and click Next. 27. At the Select Program panel, select the program you just created, and click Next. 28. Select the Advertisement Target by browsing for the collection containing your target server. Choose the target, and click OK. Click Next. 29. At the Advertisement Name panel, provide a name for the advertisement or accept the default, and click Next. 30. Click Next on the Advertisement Subcollections screen. 31. On the Advertisement schedule panel, clear the checkbox for Download content from unprotected

Dell firmware updates using Microsoft SCCM 2007 8 steps (55 min, 40 sec)	HP firmware updates using Microsoft SCCM 2007 38 steps (1 hr, 12 min, 58 sec)
	<p>data source and run locally, and click Next.</p> <p>32. Assign the program, selecting Yes to make the advertisement mandatory. Enable the checkbox for Ignore maintenance windows when running the program, and the checkbox for Allow system restart outside maintenance windows. Click Next.</p> <p>33. Review, and click Next.</p> <p>34. At the Completion panel, click Close.</p> <p>35. Click Software Distribution → Advertisements and refresh the view of available advertisements.</p> <p>36. Right-click the advertisement you just created, and select Properties.</p> <p>37. On the Schedule tab, change the program rerun behavior to Always rerun program. On the Distribution tab, change both radio buttons to Run program from distribution point. On the Interaction tab, enable the checkbox for Allow users to run the program independently of assignments. Click OK.</p> <p>38. The ConfigMgr client on the target server will receive the advertisement and begin execution of the install.cmd file, pulling firmware from the directory you created on the SCCM server. You can view the progress on the server by logging in and watching the execution of HPSUM in the taskbar.</p>

APPENDIX B – SERVER CONFIGURATION INFORMATION

Figure 5 provides detailed configuration information for the test servers.

System	Dell PowerEdge R720xd	HP ProLiant DL380p Gen8
Power supplies		
Total number	1	1
Vendor and model number	Dell D750E-S1	HP DPS-750RB A
Wattage of each (W)	750	750
Cooling fans		
Total number	6	6
Vendor and model number	AVC DBTC0638B2V	Delta Electronics PFR0612XHE
Dimensions (h x w) of each	2-1/2" x 2-1/2"	60mm x 60mm
Volts	12	12
Amps	1.20	2.3
General		
Number of processor packages	2	2
Number of cores per processor	8	8
Number of hardware threads per core	2	2
System power management policy	Balanced	Balanced
CPU		
Vendor	Intel	Intel
Name	Xeon	Xeon
Model number	E5-2660	E5-2680
Stepping	0	0
Socket type	LGA2011	LGA2011
Core frequency (GHz)	2.20	2.70
QPI Speed	8.0 GT/s	8.0 GT/s
L1 cache	256 KB	256 KB
L2 cache	2 MB	2 MB
L3 cache	20 MB	20 MB
Platform		
Vendor and model number	Dell PowerEdge R720xd	HP ProLiant DL380p Gen8
Motherboard part/model number	0M1GCRX04	ProLiant DL380p Gen8
BIOS name and version	Dell 1.2.6	HP P70
BIOS settings	Default	Default
Memory module(s)		
Total RAM in system (GB)	64	64
Manufacturer and model number	Micron Technology 36KSF1G72PZ-1G4D1	Samsung M393B5270CH0-CH9Q4
Type	PC3-10600R	PC3-10600R
Speed (MHz)	1,333	1,333
Speed running in the system (MHz)	1,333	1,333
Size (GB)	8	4
Number of RAM module(s)	8	16
Chip organization	Double-sided	Double-sided

System	Dell PowerEdge R720xd	HP ProLiant DL380p Gen8
Rank	Dual	Single
Graphics		
Vendor and model number	Matrox G200eR2	Matrox G200
Graphics memory (MB)	16	16
Driver	N/A	N/A
RAID controller		
Vendor and model number	PERC H710P Mini	HP Smart Array P420i
Firmware version	21.0.2-0001	2.14
Cache size	1 GB	0 MB
RAID configuration	RAID 1	RAID 1
Hard drives		
Vendor and model number	Dell HUC151414CSS600	HP EH0146FBQDC
Number of drives	2	2
Size (GB)	147	146
Buffer size (MB)	64	64
RPM	15,000	15,000
Type	SAS	SAS
Ethernet adapters		
Vendor and model number	Intel(R) Gigabit 4P I350-t rNDC	HP Ethernet 1Gb 4-port 331FLR
Type	Integrated	Integrated
Driver	N/A	N/A
Optical drive(s)		
Vendor and model number	N/A	HP DS8D3SH
Type	N/A	DVD
USB ports		
Number	3 external, 1 internal	4 external, 1 internal
Type	2.0	2.0
Operating systems		
Microsoft Windows	Microsoft Windows Server 2008 R2	Microsoft Windows Server 2008 R2

Figure 5: System configuration information for the test servers.

ABOUT PRINCIPLED TECHNOLOGIES



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