

FASTER AND MORE EFFICIENT SYSTEM MANAGEMENT WITH LENOVO XCLARITY ADMINISTRATOR VS. CISCO UCS MANAGER

Simplified management saves you time and labor

75% LESS TIME 72% FEWER STEPS



*compared to completing the same management tasks with Cisco UCS® Manager on a Cisco UCS solution

Server management with XClarity™ Administrator* on a Lenovo® Flex System™ solution was faster and more efficient.*



Using the right management tools are key to keeping your datacenter running smoothly. The right tools can offer savings in time while reducing complexity when handling routine management tasks. This time savings is important for your IT staff, too—less time to complete management tasks, such as configuring a node or updating firmware, can mean more time to focus on issues elsewhere in the datacenter.

Here in the Principled Technologies datacenter, we compared Lenovo XClarity Administrator, the new hardware resource-management solution, to Cisco UCS Manager. Compared to Cisco UCS Manager, Lenovo XClarity provided the following benefits:

- Initial configuration, system discovery, and inventory took 72 percent less time and 14 fewer steps.
- Creating and applying configuration patterns/profiles took 77 percent less time and 38 fewer steps.
- Deploying VMware® ESXi™ to bare-metal compute nodes took 77 percent less time and 13 fewer steps.
- Acquiring and applying firmware updates took 78 percent less time and 17 fewer steps.
- In sum, the four use cases required 75 percent less total time and 82 fewer overall steps.



FASTER AND EASIER MANAGEMENT WITH LENOVO XCLARITY ADMINISTRATOR

In addition to saving time, a valuable management solution should reduce complexity and provide a standard of consistency, reliability, and accuracy. Automation can lead to a reduction in potential human error, which in turn reduces the downtime necessary to correct it. Most importantly, these kinds of benefits are scalable, and can grow with your datacenter and company.

Lenovo XClarity Administrator is a virtual appliance that provides centralized resource management. It was designed to reduce complexity in the datacenter through automation, to facilitate prompt responses from IT staff on issues, and to promote availability of Lenovo server solutions. XClarity Administrator provides agent-free hardware management for Lenovo servers and Flex System, including the Flex System Chassis Management Module, x86 compute nodes, and I/O modules. The virtual appliance offers out-of-band, agentless management, which can mean managed endpoints do not need special software agents, or driver installation, or maintenance. One of the key benefits to being agentless means XClarity Administrator can remove operating system (OS) dependency, potentially simplifying the workload stack. For more information on XClarity Administrator and Flex System, see [Appendix A](#).

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

- Initial setup and discovery
- Server pattern/profile configuration
- Deployment of VMware ESXi to bare-metal compute nodes
- Updating firmware of system components

We recorded the time and steps to complete each use case for Lenovo XClarity Administrator with the Flex System solution and for UCS Manager with the Cisco UCS solution. We configured both solutions using the methods and best practices described in relevant documentation. For detailed configuration information of the test systems, see [Appendix B](#). For detailed steps on how we tested, see [Appendix C](#).

WHAT WE FOUND

Administrator time is valuable, and saving time through automation can create opportunities for them to focus on other important initiatives. Overall, completing all the tasks in the four use cases with Lenovo XClarity Administrator took 75 percent less time and 72 percent fewer steps than using UCS Manager. Figure 1 shows our times and steps from each use case.

Use case	Flex System (XClarity Administrator)		Cisco UCS (UCS Manager)	
	Time (h:mm:ss)	Steps	Time (h:mm:ss)	Steps
Initial configuration, discovery, and inventory of chassis	0:03:27	7	0:12:29	21
Creating and applying configuration patterns/profiles	0:00:51	12	0:03:42	50
Deploying VMware ESXi to bare-metal nodes	0:01:39	7	0:07:17	20
Acquiring and applying firmware updates	0:00:30	6	0:02:19	23
Total for all use cases	0:06:27	32	0:25:47	114

Figure 1: Time and steps for the two hardware management tools in each use case. Lower numbers are better.

Faster initial configuration, discovery, and inventory of Flex System chassis

The initial configuration, discovery, and inventory of our Flex System components with Lenovo XClarity Administrator was a fast, simple process compared to setting up the Cisco UCS solution. Using XClarity Administrator for this use case saved over 9 minutes, or took 72 percent less time, for a single chassis. XClarity Administrator also required 14 fewer steps to complete this use case. Figure 2 shows the amount of time both solutions needed for initial configuration, discovery, and inventory. Figure 3 shows the number of steps.

Using Lenovo XClarity Administrator, we found that the automated discovery and inventory process of Flex System components to be simple and effective. We first deployed and logged in to the XClarity Administrator virtual appliance. XClarity Administrator automatically discovered the chassis, making it available for us to manage. With Cisco UCS, we installed and configured the UCS Fabric Interconnects and then added the UCS chassis.

This means that automating the initial configuration, discovery, and inventory of a new Lenovo Flex System infrastructure with XClarity Administrator can help your administrators promptly identify components requiring deployment or installation, thereby decreasing the time to value (TtV) of each component.

Figure 2: The time each solution took for initial configuration, discovery, and inventory of solution components. Lower numbers are better.

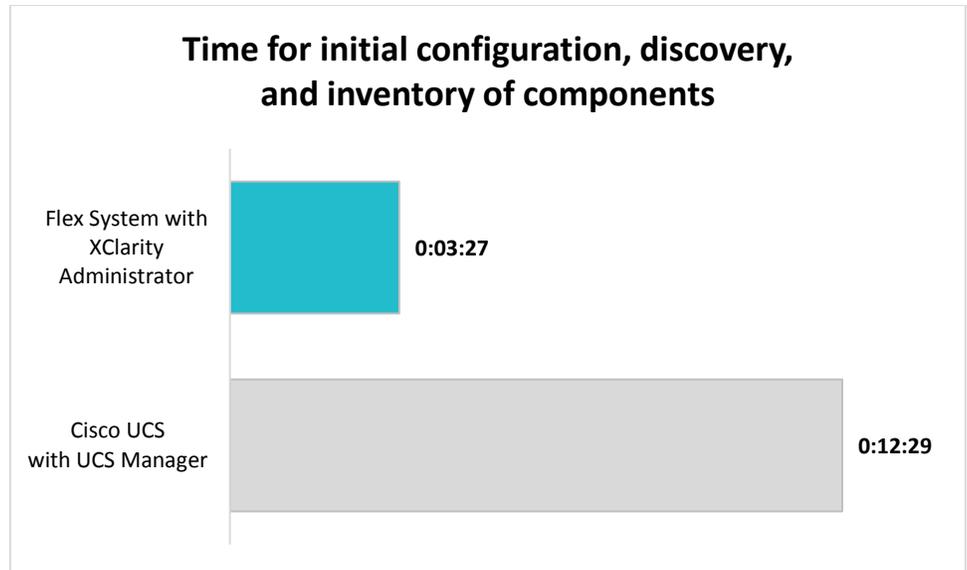


Figure 3: The number of steps each solution took for initial configuration, discovery, and inventory of solution components. Lower numbers are better.

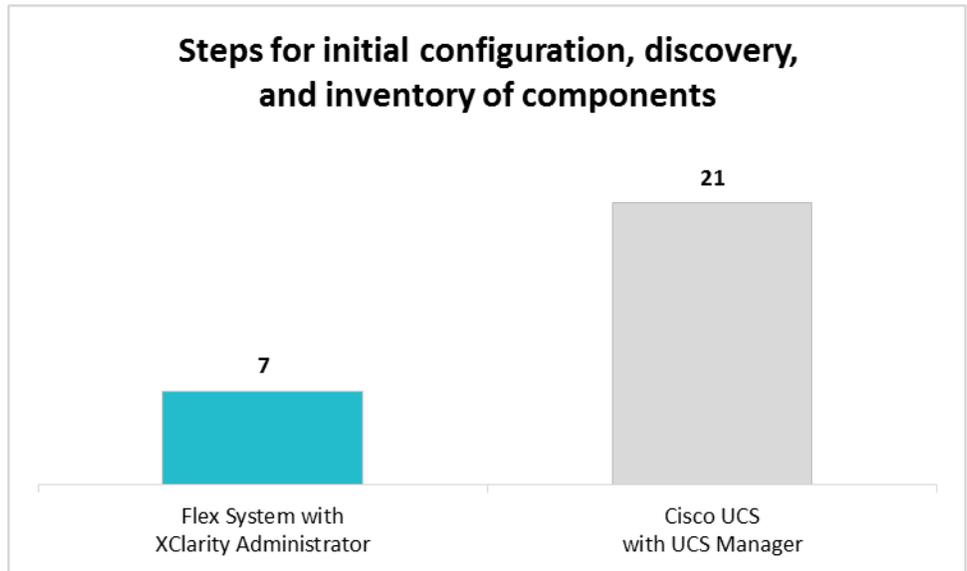


Figure 4 shows the Lenovo XClarity Administrator dashboard. After XClarity Administrator gathers discovered endpoints into an inventory, administrators can view the inventory and the status of any component at a glance from the dashboard.

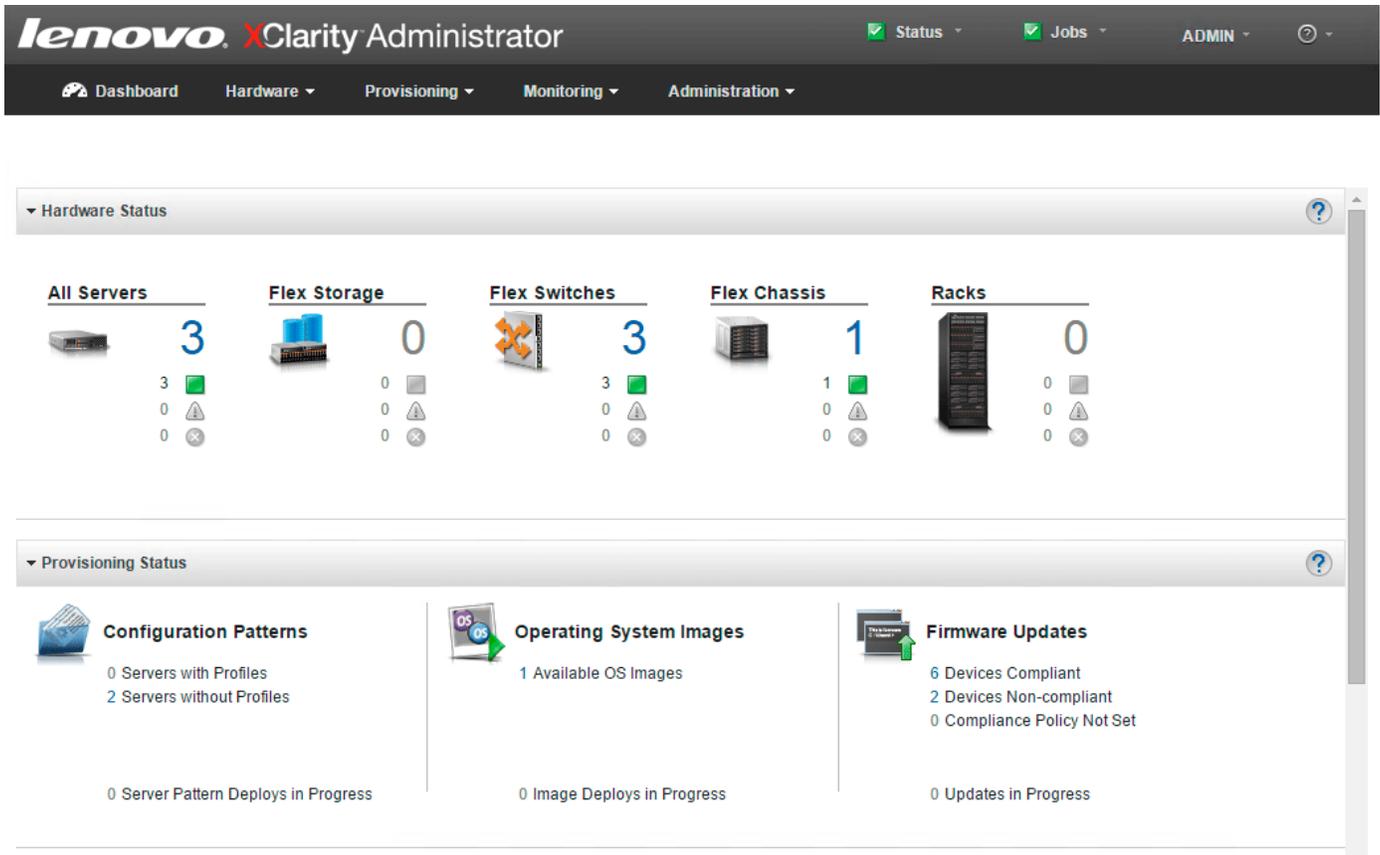


Figure 4: The Lenovo XClarity Administrator dashboard displaying components of our Flex System solution.

Faster pattern/profile configuration

The Lenovo XClarity Administrator interface allowed us to create a configuration template, called a configuration pattern, and use the pattern to configure multiple nodes simultaneously. This kind of simplicity can let administrators quickly see which nodes have configurations, apply patterns to the ones that need them, and then attend to other matters in the datacenter. Applying configurations en masse, as opposed to individually, can additionally help reduce the possibility of human error.

Compared to Cisco UCS Manager, which uses a similar concept but calls the configuration template a service profile, we found that XClarity Administrator saved 77 percent of the necessary time to create and apply a configuration pattern to a node. Saving time in configuration could mean administrators can move on to installing the operating system or updating firmware sooner, if necessary. In addition to less time, it was simpler to create and apply the configuration pattern with XClarity Administrator with 38 fewer steps—the biggest difference between the two solutions in the four use cases. Figure 5 shows the amount of time both solutions needed to configure one node; Figure 6 shows the number of steps.

Figure 5: The time each solution took to create and apply configuration patterns or profiles. Lower numbers are better.

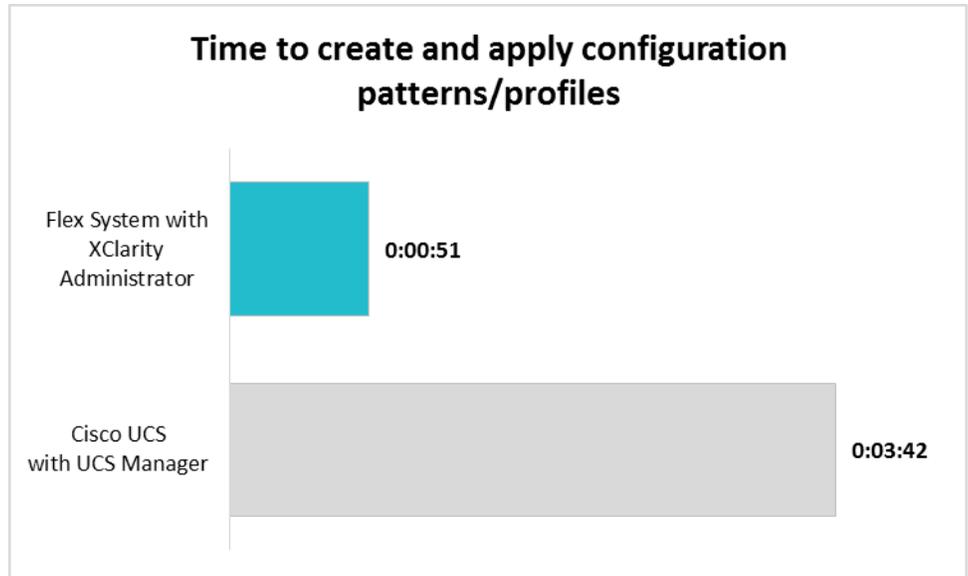
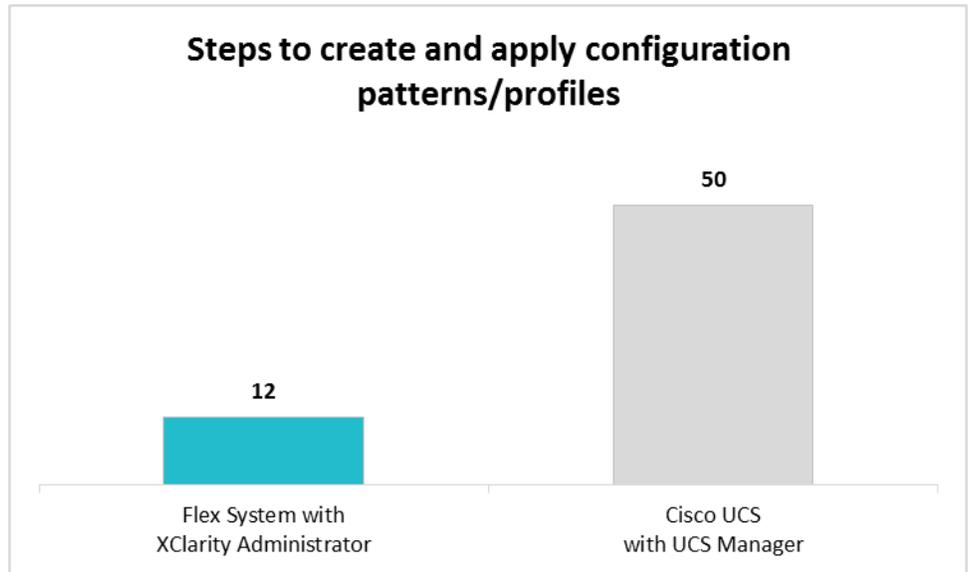


Figure 6: The number of steps each solution needed to create and apply configuration patterns or profiles. Lower numbers are better.



Faster deployment of VMware ESXi to bare-metal nodes

Lenovo XClarity Administrator automates deployment of VMware ESXi, Microsoft® Windows Server® including Hyper-V®, or Red Hat® Enterprise Linux® including KVM to bare-metal compute nodes or servers. Administrators can deploy the operating system or hypervisor onto a single node or onto multiple nodes simultaneously, with XClarity Administrator. XClarity Administrator did not require an external file server or the use of software-based consoles to manage the installation. The opposite was true for Cisco UCS Manager, which did not contain a built-in repository for OS or hypervisor ISO images. This means administrators using XClarity

Administrator can import the ISO image, select the endpoints for deployment, and execute the deployment job.

Deploying VMware ESXi to the compute nodes took 5 minutes and 38 seconds less with XClarity Administrator than it took UCS Manager to do the same on the UCS solution—a time savings of 77 percent. With faster deployment of VMware ESXi, your administrators could move on to other critical tasks sooner, such as deploying virtual machines into production. In addition to less time, it also took 13 fewer steps with XClarity Administrator—7 steps compared to 20 steps. Figure 7 shows the amount of time it took with both solutions; Figure 8 shows the number of steps. These savings could scale according to your own datacenter needs and demands.

Figure 7: The time each solution took to deploy VMware ESXi to bare-metal compute nodes. Lower numbers are better.

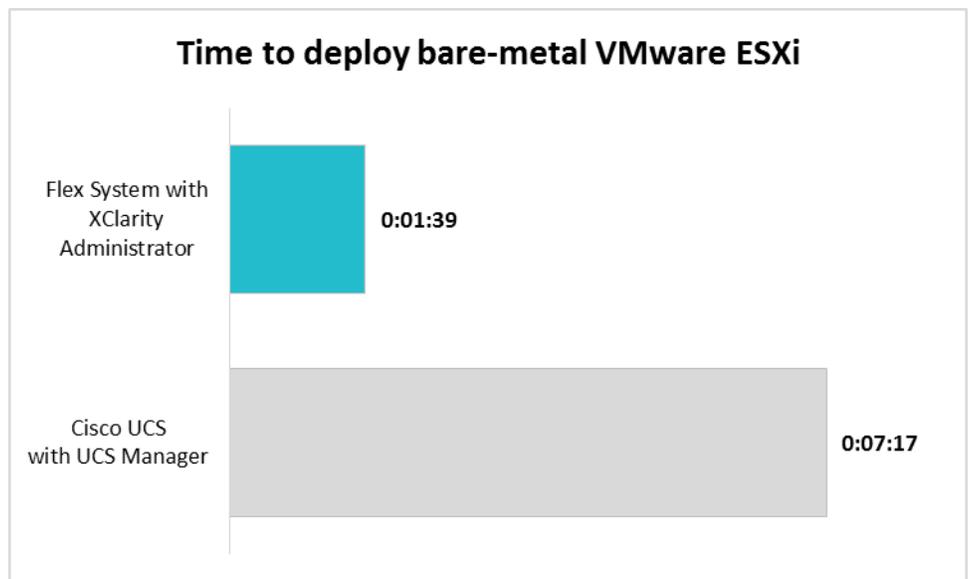


Figure 8: The number of steps each solution needed to deploy a VMware ESXi to the bare-metal compute nodes. Lower numbers are better.

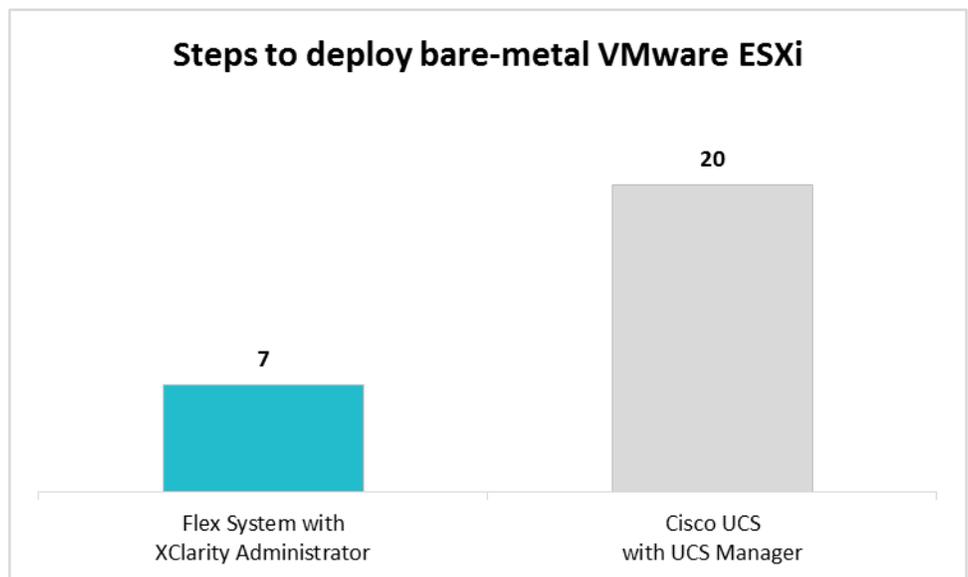


Figure 9 shows the Lenovo XClarity Administrator interface displaying endpoints available to accept OS or hypervisor deployment. Your administrators can quickly select the desired endpoints and then execute the deployment job.

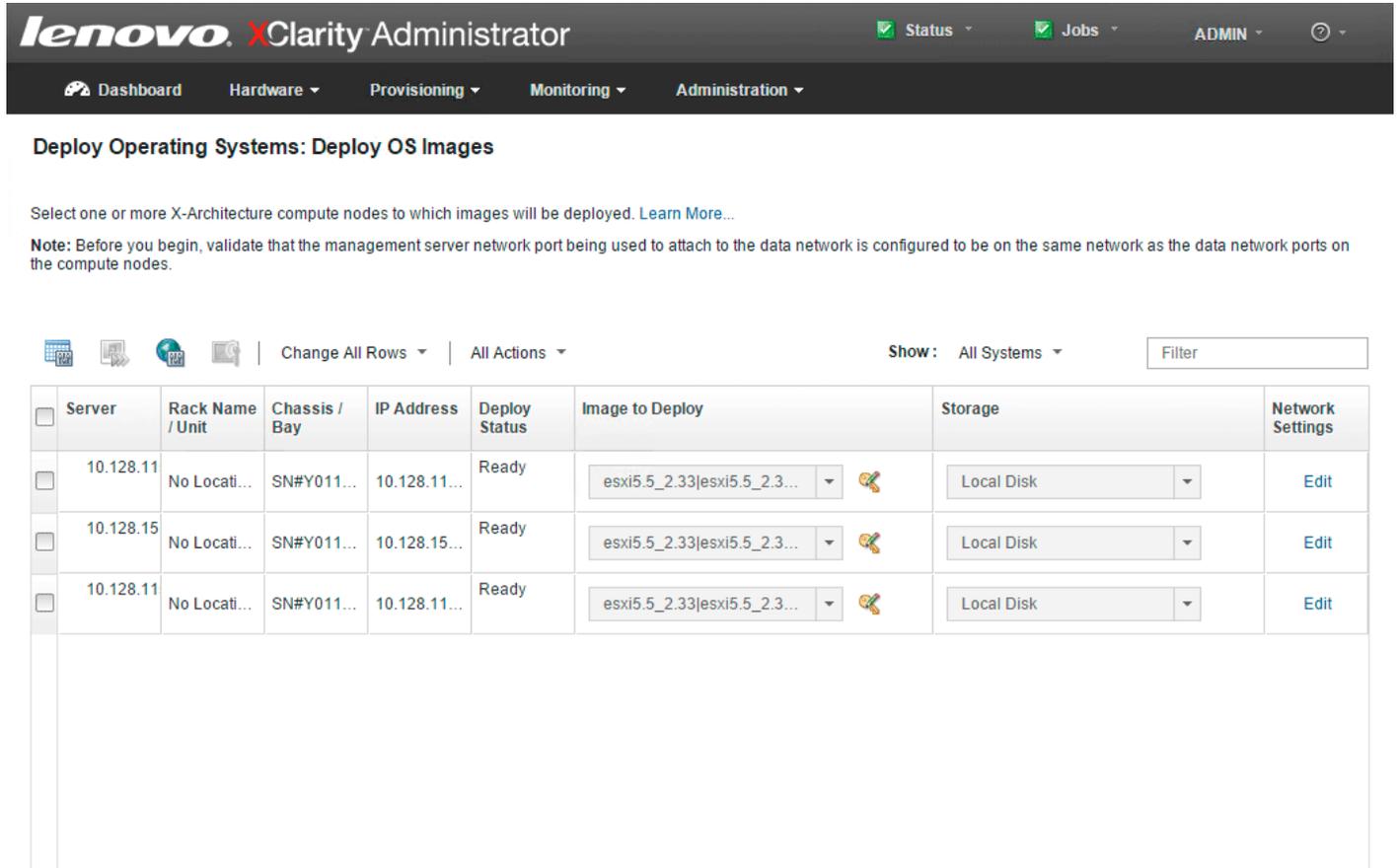


Figure 9: The Lenovo XClarity Administrator dashboard when deploying an OS image.

Faster updates and firmware management

Applying firmware updates to Flex System with Lenovo XClarity Administrator saved 78 percent of the time that UCS Manager needed to update UCS components. It was simpler to update with XClarity Administrator too, requiring 17 fewer steps than performing the task with UCS Manager. Figure 10 shows the amount of time it took with both solutions, and Figure 11 shows the number of steps.

Figure 10: The time each solution needed to acquire and apply firmware updates. Lower numbers are better.

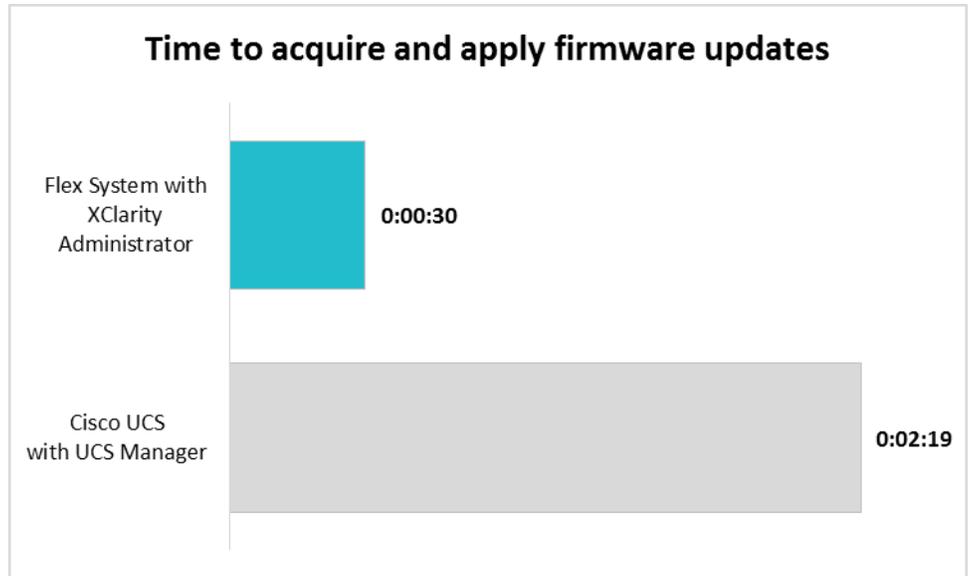


Figure 11: The number of steps each solution needed to acquire and apply firmware updates. Lower numbers are better.

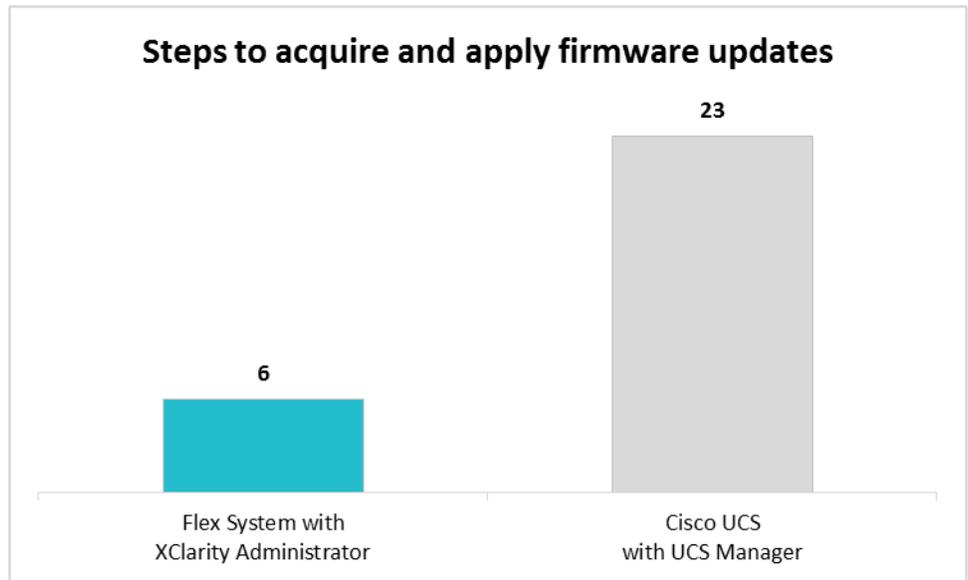


Figure 12 shows the Lenovo XClarity Administrator interface displaying the endpoints that can receive firmware updates. Similar to deploying an OS or hypervisor, your administrators can quickly select the desired endpoints to update and then execute the update job.

APPENDIX A – ABOUT THE COMPONENTS

About Lenovo XClarity Administrator

Designed to integrate into Lenovo servers and the Flex System converged infrastructure platform, Lenovo XClarity Administrator is a hardware management solution that can simplify and automate infrastructure tasks. XClarity Administrator features an intuitive graphical user interface (GUI); automated firmware updates, configuration patterns, and bare-metal provisioning of OSs and hypervisors; support for integration into various external, higher level management, automation, and orchestration tools; and control over hardware resources through scripting and commands by using Microsoft Windows PowerShell®.

About the Lenovo Flex System

The Flex System is the next generation of blade technology that offers potentially greater performance, bandwidth, and ability to consolidate and virtualize than previous systems. At the center of the Flex System is the Flex System Enterprise Chassis, which enables high-speed performance with integrated servers and networking. According to Lenovo, the flexible design of this system lets it meet the needs of varying workloads with independently scalable IT resource pools for higher utilization and lower cost per workload. Learn more at www.redbooks.ibm.com/abstracts/tips0863.html.

APPENDIX B – SYSTEM CONFIGURATION INFORMATION

Figure 13 provides detailed configuration information for the Lenovo Flex System nodes.

System	Lenovo Flex System x440 Compute Node-7917	Lenovo Flex System x240 Compute Node-8737	
General			
Number of processor packages	4	2	
Number of cores per processor	4	4	
Number of hardware threads per core	2	2	
System power management policy	Default	Default	
CPU			
Vendor	Intel®	Intel	
Name	Intel Xeon® Processor	Intel Xeon Processor	
Model number	E5-4603	E5-2680	
Stepping	M1	C1	
Socket type	FCLGA2011	FCLGA2011	
Core frequency (GHz)	2.0	2.7	
Bus frequency	6.4 GT/s	8 GT/s	
L1 cache	128 KB	128 KB	
L2 cache	256 KB	256 KB	
L3 cache	10 MB	20 MB	
Platform			
Vendor and model number	Lenovo Flex System® x440 Compute Node (7917)	Lenovo Flex System x240 Compute Node (8737)	
Motherboard model number	88Y6237	95Y4788	
BIOS name and version	CNE136SUS / 1.30 (Nov 8, 2013)	B2E136TUS / 1.40 (Nov 12, 2013)	
BIOS settings	Default	Default	
Memory modules			
Total RAM in system (GB)	192	32	192
Vendor and model number	HMT31GR7CFR4C-PB	HMT351R7CFR8C-PB	HMT31GR7CFR4C-PB
Type	PC3-12800R	PC3-12800R	PC3-12800R
Speed (MHz)	1600	1600	1600
Speed running in the system (MHz)	1600	1600	1600
Size (GB)	8	4	8
Number of RAM module(s)	24	8	24
Rank	2Rx4	2Rx8	2Rx4
Hypervisor			
Name	VMware ESXi 5.5	VMware ESXi 5.5	
Language	English	English	

System	Lenovo Flex System x440 Compute Node-7917	Lenovo Flex System x240 Compute Node-8737
Hard drives		
Vendor and model number	90Y8876	42C0529
Number of drives	2	2
Size (GB)	600	200
RPM	10,000	N/A
Type	SAS	SSD
Expansion card		
Name	Lenovo Flex System FC3052 2-port 8Gb FC	Lenovo Flex System FC3052 2-port 8Gb FC
Firmware version	2.01A11 (Nov 15, 2012)	2.01A11 (Nov 15, 2012)

Figure 13: System configuration information for the test systems.

Figure 14 provides detailed information for the Cisco UCS chassis.

System	Cisco UCS 5108 blade server chassis
Power supplies	
Number of power supplies	4
Vendor and model number	Cisco® Systems Inc N20-PAC5-2500W
Wattage of each (W)	2,500
Cooling fans	
Total number of fan modules	8
Vendor and model number	Cisco Systems Inc N20-FAN5
Chassis firmware	
Board Controller	11.0
CIMC Controller	2.2(1d)
IOM firmware	2.2(1d)
I/O modules	
Switch	Cisco UCS 2208XP
Occupied bay	1, 2

Figure 14: Configuration information for the blade enclosure.

Figure 15 provides detailed information for the Cisco UCS servers.

System	Cisco UCS B200 M3 blade server
Enclosure	
Blade enclosure	Cisco UCS 5108
General	
Number of processor packages	2
Number of cores per processor	10
Number of hardware threads per core	2
System power management policy	Default

System	Cisco UCS B200 M3 blade server
CPU	
Vendor	Intel
Name	Xeon
Model number	E5-2680 v2
Stepping	M1
Socket type	FCLGA2011
Core frequency (GHz)	2.8
Bus frequency (GHz)	4
L1 cache	10 × 32 KB instruction caches, 10 × 32 KB data caches
L2 cache	10 × 256 KB
L3 cache	25 MB
Platform	
Vendor and model number	Cisco UCS B200 M3
Motherboard model number	UCSB-B200-M3
BIOS version	B200M3.2.2.1a.0.111220131105
Memory module(s)	
Total RAM in system (GB)	384
Vendor and model number	SK Hynix HMT42GR7AFR4C-RD
Type	PC3-14900R
Speed (MHz)	1,866
Speed running in the system (MHz)	1,866
Size (GB)	16
Number of RAM module(s)	24
Chip organization	Double-sided
Rank	Dual
RAID controller	
Vendor and model number	LSI® MegaRAID® SAS 2004 ROMB RB2
Firmware version	20.11.1-0135
Firmware	
CIMC	1.40.40
Board Controller	2.2(1d)
BIOS	B200M3.2.2.1a.0.111.220131105
Cisco UCS VIC 1240	2.2(1d)

Figure 15: Configuration information for the blade server.

APPENDIX C – HOW WE TESTED

Discovery and inventory of Flex System chassis and compute nodes

Discovery and inventory using Lenovo XClarity Administrator

1. Log on to the Lenovo XClarity Administrator console.
2. In the Lenovo XClarity Administrator console, click Hardware.
3. Click Discover and Manage New Devices.
4. In the Discover and Manage New Devices screen, select the chassis that appears, and click Manage Selected.
5. In the Manage window, input the username, password, and recovery password, and click Manage.
6. In the Manage Chassis window, click OK after the XClarity Administrator finishes connecting to the chassis.
7. When given the option, select Continue to Chassis Configuration.

Discovery and inventory using Cisco UCS Manager

1. Assuming UCS Manager launches in the default tab (Equipment), select the Equipment tree item, and click the Policies subtab.
2. In Global Policies, verify the Chassis/FEX Discovery Policy matches the physical configuration (our test used two 10Gb connections between each Fabric Interconnect and IOM, so we selected 2 Link).
3. Configure the power policy to match the chassis' configuration (for our test, we selected Grid).
4. Click Save Changes.
5. Click OK.
6. Click the Fabric Interconnects subtab.
7. In the Fabric Interconnects subtab pane, click the topmost + to extend all available ports.
8. For Fabric Interconnect A, select the server ports, right-click, and select Configure as Server Port (we used ports 1 and 2 as our server ports for Fabric Interconnect A).
9. Click Yes.
10. Click OK.
11. For Fabric Interconnect A, select the uplink port, right-click, and select Configure as Uplink Port (we used port 3 as our uplink port on Fabric Interconnect A).
12. Click Yes.
13. Click OK.
14. Scroll down to Fabric Interconnect B, select the server ports, right-click, and select Configure as Server Port (we used Ports 1 and 2 as our server ports for Fabric Interconnect B).
15. Click Yes.
16. Click OK.
17. For Fabric Interconnect B, select the uplink port, right-click, and select Configure as Uplink Port (we used port 3 as our uplink port on Fabric Interconnect B).
18. Click Yes.
19. Click OK.
20. Verify that the Overall Status changes to Up for all configured ports, and the Administrative State changes to Enabled.
21. Click the + in the Equipment tree to expand all items; stop the timer when Chassis 1 appears.

Creating and applying configuration patterns to Flex System compute nodes

Creating and applying configuration patterns using Lenovo XClarity Administrator

1. Log onto the Lenovo XClarity Administrator console.

2. In the Lenovo XClarity Administrator console, click Provisioning.
3. Click Patterns.
4. In the Configuration Patterns: Patterns window click the Create a new pattern button.
5. In the New Server Pattern Wizard window, click Create a new pattern from scratch.
6. Make sure the Form Factor is Flex Computer Node, write a name, and click Next.
7. In the Local Storage tab, choose the following options:
 - Disk Type: Any type (try HDD first)
 - Raid Level: RAID 1 (Mirroring)
 - Number of drives: 2
 Then click Next.
8. In the I/O Adapters tab, click Add I/O Adapter.
9. In the Add I/O Adapter window, select the following options:
 - PCI Slot 2
 - Lenovo Flex System FC3052 2-port 8Gb FC Adapter
 Then click Add.
10. Click Next.
11. Leave the option on Keep existing boot mode and click Next.
12. Choose Extended UEFI: x240 Virtualization and click Save and Deploy.
13. In the Deploy Server Pattern window, select your server and click Deploy.

Configuring and assigning pattern/profile using Cisco UCS Manager

1. Click the LAN tab.
2. Under the Pools tree, expand the root organization, and select IP Pools.
3. In the IP Pools pane, right-click IP Pool ext-mgmt, and select Create a Block of IPv4 Addresses.
 - Enter the beginning IP address range (we used 10.128.173.1).
 - Enter the size (we used 32).
 - Enter the Subnet Mask (we used 255.255.0.0).
 - Enter the Default Gateway (we used 10.128.0.1).
 - Enter the Primary DNS (we used 10.128.0.10).
4. Click OK.
5. Click OK again.
6. Under the Pools tree, expand the root organization, and select MAC Pools.
7. Right-click MAC Pool default, and select Create a Block of MAC Addresses.
 - Enter the first MAC Address (we used 00:25:B5:12:00:00).
 - Enter the size (we used 64).
8. Click OK.
9. Click OK again.
10. Click the Servers tab.
11. Under the Pools tree, expand the root organization, and select UUID Suffix Pools.
12. Right-click Pool default, and select Create a Block of UUID Suffixes.
 - Leave the default UUID Suffix, and enter the size (we used 10).
13. Click OK.
14. Click OK again.
15. Click the LAN tab.
16. Under the Policies tree, expand the root organization, right-click vNIC Templates, and select Create vNIC Template.

- Name the vNIC Template to match Fabric A (we used vNICTemplateA).
 - Check Enable Failover.
 - Change MTU to 9000.
 - Change MAC Pool to the default pool.
17. Click OK.
 18. Click OK again.
 19. Right-click vNIC Templates, and select Create vNIC Template.
 - Name the vNIC Template to match Fabric B (we used vNICTemplateB).
 - Change Fabric ID to Fabric B.
 - Check Enable Failover.
 - Change MTU to 9000.
 - Change MAC Pool to the default pool.
 20. Click OK.
 21. Click OK again.
 22. Click the Servers Tab.
 23. Expand the Servers tree, right-click Service Profile Templates, and select Create Service Profile Template.
 24. Name the template (we used b200-template).
 25. Click Next.
 26. Change the configuration mode from Simple to Expert.
 27. Click Add.
 - Name the vNIC for Fabric A (we used 0).
 - Check Use vNIC Template.
 - Change vNIC Template to vNIC Template A.
 - Change Adapter Policy to VMWare.
 28. Click OK.
 29. Click Add.
 - Name the vNIC for Fabric B (we used 1).
 - Check Use vNIC Template.
 - Change vNIC Template to vNIC Template B.
 - Change Adapter Policy to VMWare.
 30. Click OK.
 31. Click Next.
 32. Change SAN connectivity to No vHBAs.
 33. Click Next.
 34. Click Next to skip the Zoning configuration screen.
 35. Click Next to skip the vNIC/vHBA Placement screen.
 36. Click Next to leave the default boot policy.
 37. Click Next to skip the Maintenance Policy screen.
 38. At the Server Assignment screen, change the selected power state to Down.
 39. Click Next.
 40. Click Finish.
 41. Click OK.

42. Select the newly created template (Service Template b200-template), right-click, and select Create Service Profiles From Template.
 - Enter the Naming Prefix (we used `server`).
 - Enter the Name Suffix Starting Number (we used 1).
 - Enter the Number of Instances (we used 3).
43. Click OK.
44. Click OK again.
45. Click the Equipment tab.
46. Click the topmost + icon to expand all items in the Equipment tree.
47. Under the Chassis tree, right-click the server for deployment, and click Associate Service Profile.
48. Select the Service Profile from the list of Available Service Profiles (Service Template b200-template), and click OK.
49. Click Yes when the Associate Service Profile warning appears.
50. Click OK to acknowledge the system modification.

Deploying bare-metal version of VMware ESXi to Flex System chassis and compute nodes

Deploying bare-metal ESXi using Lenovo XClarity Administrator

1. Log onto the Lenovo XClarity Administrator console.
2. In the Lenovo XClarity Administrator console, click Provisioning.
3. Click Deploy OS Images.
4. On your first server, click on the Edit button under Network Settings.
5. In the Edit Network Settings button, enter the host name and IP information and click OK.
6. Repeat steps 4 and 5 for the next two servers.
7. Check all servers' checkboxes, make sure that the image to deploy is the provided ESXi image, and then click Deploy Images.
8. At the deployment confirmation screen, double-check everything is set up the way you want, and click Deploy.

Deploying bare-metal ESXi using Cisco UCS Manager

Repeat steps X through Y to deploy to another server.

1. Click the Equipment tab.
2. Expand the Equipment tree, expand the Chassis tree, expand the Chassis 1 tree, expand the Servers tree, right-click Server 1, and select KVM console.
3. When the Security Warning appears, check I accept the risk and want to run this application, and click Run.
4. When the second Security Warning appears, check Always trust this certificate, and click Run.
5. When the Unencrypted KVM Session warning appears, select Accept this session, check Remember this configuration for future connections to this server, and click Apply.
6. Click the Virtual Media tab.
7. When the Unencrypted Virtual Media Session warning appears, select Accept this session, check Remember this configuration for future connections to this server, and click Apply.
8. Click Add Image..., and navigate to the folder where the ESXi 5.5 image is stored, select the image, and click Open.
9. Check the Mapped box next to the newly added image.
10. Click the KVM tab.
11. Click Boot Server.
12. Click OK.
13. Click OK again.
14. When the VMware ESXi 5.5.0 Installation welcome dialog appears, press Enter to continue.
15. Press F11 to accept the EULA.

16. Press enter to select the local storage device.
17. If a previous installation of ESXi exists, use the spacebar to select Install ESXi, overwrite VMFS datastore, and press Enter.
18. Press Enter to select US Default as the keyboard layout.
19. Type and confirm the Root password (Password1), and press Enter.
20. Press F11 to install ESXi.

Acquiring and applying firmware updates to Flex System nodes

Applying firmware updates using Lenovo XClarity Administrator

1. Log on to the Lenovo XClarity Administrator console.
2. In the Lenovo XClarity Administrator console, click Provisioning.
3. Click Apply / Activate.
4. In the Firmware Updates: Apply / Activate screen, check all units, then change their assigned policy to the policy you created, and then click Perform Updates.
5. In the Update summary, select the following options:
 - Update Rule: Stop all updates on error
 - Activation Rule: Immediate activation
6. Then click Perform Update.
7. If you get a confirmation window warning you that the endpoint might be restarted, click OK.

Applying firmware updates using Cisco UCS Manager

Obtaining Software Bundles from Cisco

1. In a web browser, navigate to Cisco.com.
2. Click Log In.
3. Enter the Cisco support User Name and Password, and click Log In.
4. Click the Support link from the navigation menu.
5. In the More Categories column, click Servers – Unified Computing.
6. Select B-Series Blade Servers.
7. Click the Download Software link.
8. Click the link for UCS B-Series Blade Server Software.
9. Click the Download button.
10. Click Accept License Agreement, and the download will begin.

Adding Firmware Images to the Fabric Interconnect

1. From UCS Manager, click the Equipment tab.
2. From the Equipment tree, click Equipment.
3. Click the Firmware Management subtab.
4. Click Download Firmware.
5. Leave Local File System selected, and click Browse.
6. Navigate to the downloaded firmware bundle, select the bundle, and click Select.
7. Click OK. The file will begin uploading.
8. Click OK when the Download Task dialog appears. Monitor the Progress Status until it reports 100%, and click OK.

Updating UCS B-Series Blade Server firmware

Continued from previous steps.

1. Click Update Firmware.
2. Change the Version option to Bundle.
3. Click the dropdown arrow next to Set Bundle, and select the newly downloaded firmware bundle.
4. Click Apply.

5. Click OK, and the update will begin.

ABOUT PRINCIPLED TECHNOLOGIES



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.

Principled Technologies is a registered trademark of Principled Technologies, Inc.
All other product names are the trademarks of their respective owners.

Disclaimer of Warranties; Limitation of Liability:

PRINCIPLED TECHNOLOGIES, INC. HAS MADE REASONABLE EFFORTS TO ENSURE THE ACCURACY AND VALIDITY OF ITS TESTING, HOWEVER, PRINCIPLED TECHNOLOGIES, INC. SPECIFICALLY DISCLAIMS ANY WARRANTY, EXPRESSED OR IMPLIED, RELATING TO THE TEST RESULTS AND ANALYSIS, THEIR ACCURACY, COMPLETENESS OR QUALITY, INCLUDING ANY IMPLIED WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE. ALL PERSONS OR ENTITIES RELYING ON THE RESULTS OF ANY TESTING DO SO AT THEIR OWN RISK, AND AGREE THAT PRINCIPLED TECHNOLOGIES, INC., ITS EMPLOYEES AND ITS SUBCONTRACTORS SHALL HAVE NO LIABILITY WHATSOEVER FROM ANY CLAIM OF LOSS OR DAMAGE ON ACCOUNT OF ANY ALLEGED ERROR OR DEFECT IN ANY TESTING PROCEDURE OR RESULT.

IN NO EVENT SHALL PRINCIPLED TECHNOLOGIES, INC. BE LIABLE FOR INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH ITS TESTING, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL PRINCIPLED TECHNOLOGIES, INC.'S LIABILITY, INCLUDING FOR DIRECT DAMAGES, EXCEED THE AMOUNTS PAID IN CONNECTION WITH PRINCIPLED TECHNOLOGIES, INC.'S TESTING. CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES ARE AS SET FORTH HEREIN.