MIGRATE SERVER IDENTITIES AND DATA 34 PERCENT FASTER WITH CISCO UCS AND WITH 83 PERCENT FEWER STEPS THAN HP

Migrate servers in 83.3% fewer steps

and 34.8% faster

Cisco® UCS™ B200 M3 Blade Server to a C240 M3 Rack Server

vs. HP ProLiant BL460c Gen8 server blade to a DL380p Gen8 rack server

Organizations need to move applications from one physical server to another for any number of reasons, which requires that server's identity settings (UUID, connectivity, firmware, etc.) and data ownership on the storage array transfer as well. Because maximum flexibility is always in an organization's best interest, Principled Technologies completed a migration from a blade server to a rack server for both Cisco Unified Computing System™ (UCS) servers and HP ProLiant servers.

Using Cisco UCS Manager Service Profiles and UCS SingleConnect Technology, complete migration of the server identity, including data access transfer, took only 6 steps and 8 minutes 43 seconds. In comparison, the HP solution (without data access transfer) required 36 steps and 13 minutes 22 seconds. Transferring data ownership (access and rights) for the HP solution requires additional steps and time. Migrating the complete server identity with data ownership using the Cisco UCS solution took 83.3 percent fewer steps and was 34.8 percent faster than the HP solution. With HP, the data adherence step is still a pending operation.

The time and steps saved with UCS become even more dramatic in large-scale migration scenarios. Cisco UCS with UCS SingleConnect can save your IT staff an enormous amount of time and reduce potential errors by simplifying the configuration process.

JULY 2013

A PRINCIPLED TECHNOLOGIES TEST REPORT

Commissioned by Cisco Systems, Inc.

FASTER + SIMPLER = BETTER

To demonstrate the migration benefits of the Cisco UCS solution, we configured a Cisco UCS C240 M3 Rack Server and a Cisco UCS B200 M3 Blade Server (in a UCS 5108 Blade Server Chassis). We configured a UCS Manager Service Profile for the Cisco UCS B200 M3 Blade Server and installed VMware ESXi 5.1.0 to Boot from SAN (storage area network). We used Cisco UCS Service Profile association to transfer the profile, or server identity, from the UCS B200 M3 blade server to UCS C240 M3 rack server. Doing this automatically migrated the server identity settings and data ownership rights from the UCS blade server to the rack server. For a partial list of server identity settings that you can manage with UCS Manager, see Appendix F.

Then, we completed the same migration with the HP ProLiant solution. We configured an HP ProLiant DL380p Gen8 Rack Server and an HP ProLiant BL460c Gen8 Server Blade (in a HP BladeSystem c7000 Enclosure). The HP ProLiant BL460c Gen8 Server Blade was configured with VMware ESXi 5.1.0 to boot from SAN prior to the migration. There is no direct blade to rack server identity transfer capability available from HP.

Figure 1 shows the total number of steps each solution took to complete the migration.

(Note: The HP solution requires additional steps to configure the data ownership rights to the SAN to the rack server configuration. We do not show those steps because this process can vary between storage vendors. These extra steps are not necessary with the Cisco solution because of the built-in capabilities of UCS Manager Service Profiles and UCS SingleConnect.)

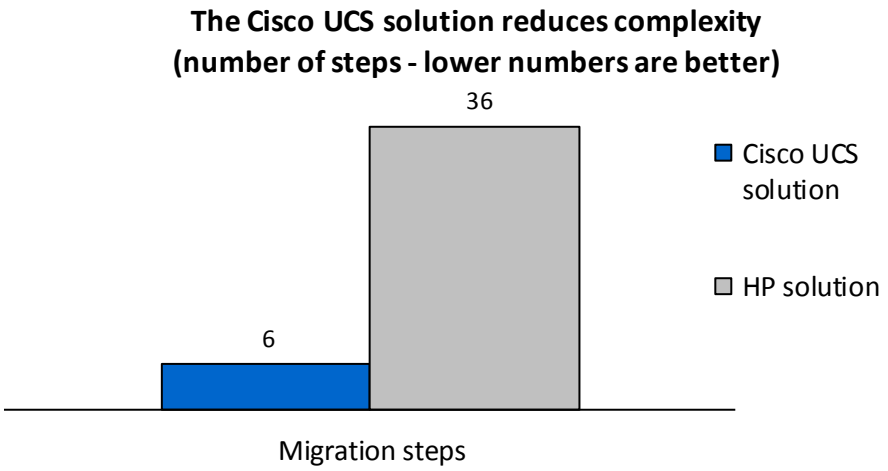

Figure 1: The Cisco UCS solution's automated approach to server identity migration, including data ownership rights, took 83.3 percent fewer steps, making it the solution of choice. (Fewer steps are better.)

The difference in the number of steps required is due to the way each solution handles the migration. A UCS Service Profile is assigned to a single physical server, and it

contains detailed information about the server, such as Fibre and NIC addresses, boot order, and other configuration information. The Cisco UCS solution leverages Cisco UCS Manager Service Profiles, which coordinates and automates element management at every layer of the hardware stack, including RAID levels, BIOS settings, firmware revisions, VLAN and VSAN network settings, QoS, and data center connectivity. You can easily transfer a Service Profile (a server identity) from one server to another, and UCS automatically configures the new server. Because a Service Profile is associated with a single physical server, when the service profile (identity) is transferred all server identity parameters adhere. There is no danger that the old and new server will be in contention for UUID, MAC address, WWPN, etc., since these settings are part of the Service Profile.

It took only six steps to initiate the UCS migration process, taking the UCS B200 M3 Blade Server's identity and transferring it to UCS C240 M3 rack server. There were no additional steps required and the C240 M3 was set up and booted to the VMware ESXi instance with full data ownership and access, with no need for more user interaction.

HP also offers profiles, called server profiles, to the servers inside the HP BladeSystem c7000 Enclosure with HP Virtual Connect Manager (VCM). VCM works with HP Virtual Connect FlexFabric 10 Gb/24-port modules that are installed into the chassis. With VCM, you can save a server configuration and move some of the setting between the HP ProLiant server blades. However, the profile (identity) cannot be copied or moved outside of a c7000 enclosure to a rack server. This means that the technician must manually configure the rack server with required configuration settings during the migration (including data ownership if necessary).

Important considerations

While moving server configuration settings such as BIOS and firmware are important during a migration, an additional critical component is the server's interaction with the external network controllers and access rights and control over the associated data. Both Fibre storage controllers and network cards have **unique** addresses. A Fibre card has a WWPN address and a network card has a MAC address. These unique addresses must be configured for any server to enable communication. For example, a SAN uses an initiator based off the Fibre card WWPN address. The initiator tells the storage which card is accessing it. These initiators are assigned to a storage logical unit number (LUN) so the server can access its specific data store. If a server with a different WWPN address than already assigned to a LUN (data store) wants to access this LUN, the technician must manually map the new address to that LUN. Network controllers have similar issues inside the server operating system and network infrastructure.

The Cisco UCS Service Profile allows you to migrate from a blade server to rack server (or another blade), transferring the WWPN and MAC addresses from the original

server to the destination server, all with a single software application. This eliminates the requirement for a technician to manually move and configure the storage and network addresses from the old server to the new. The HP solution does not offer an option to do this type of transfer. Instead, multiple system administrators need to coordinate their activities and work with multiple software applications to complete the migration. Additionally, manual intervention and inputs add time and increase the opportunity for errors, which would then take additional time to trouble shoot and correct.

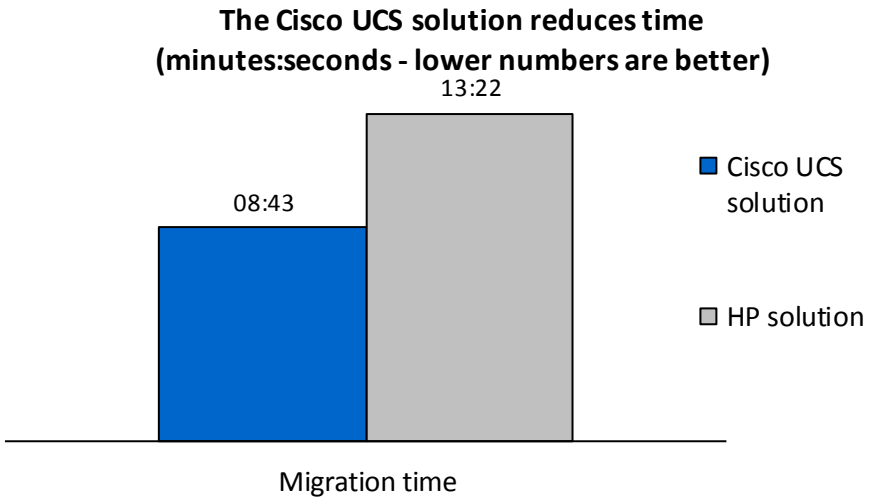

Figure 2: The Cisco UCS solution's automated approach to server identity migration, including data access rights, took 34.8 percent less time, making it the solution of choice. (Smaller numbers, reflecting less time, are better.)

In terms of number of tasks and amount of time, the Cisco UCS solution is the clear winner.

Figure 2 shows the total time for the migration process. The Cisco UCS solution was 34.8 percent faster, only taking 8 minutes and 43 seconds, and it is important to note that user interaction was required only to initiate the process. Once initiated no additional user input is needed for the duration of the migration. In contrast, the HP solution required user interaction throughout most of the process.

Figure 3 breaks down the steps and time and shows the additional tasks that must be still be performed with the HP solution.

(Note: We present detailed diagram of our test bed in Appendix B, the detailed steps we followed when testing the two solutions in Appendix C, hardware specs on the blade servers in Appendix D and rack servers in Appendix E.)

Cisco UCS solution			HP ProLiant solution		
Task	**Steps**	**Time**	**Task**	**Steps**	**Time**
Migrate boot from SAN OS: From Cisco UCS B200 M3	6	8:43	Log into HP BladeSystem Onboard Administrator and shut down OS on the HP ProLiant BL460c Gen8 Server Blade	4	1:47
			Configure the storage with the HP	We do not show the number	

Cisco UCS solution			HP ProLiant solution		
Task	**Steps**	**Time**	**Task**	**Steps**	**Time**
to Cisco UCS C240 M3 Rack Server using Service Profile association.			ProLiant DL380p Gen8 Fibre WWPN, add the DL380p Gen8 server to the boot LUN, and remove HP ProLiant BL460c Gen8 from the boot LUN	of steps or time to complete because the configuration process can vary quite a bit between different storage platforms. However, this task will require several steps and some time to complete with the HP solution. In contrast, the Cisco UCS solution automatically assigns the same WWPN to the new server, making interaction with the storage unnecessary.	
			Configure the HP ProLiant DL380p Gen8 server's Fibre controller to boot from SAN.	22	4:04
			Change the HP ProLiant DL380p Gen8 server's BIOS boot order to boot from SAN.	4	6:53
			Configure the HP ProLiant DL380p Gen8 server's network configuration inside OS	6	0:38
Total	**6**	**8:43**	**Total**	**36**	**13:22**

Figure 3: The tasks involved in migrating server identities, settings, and data access rights from a blade server to a rack server for both Cisco UCS and HP. In terms of number of steps, tasks, and amount of time on tasks, the Cisco UCS solution is the clear winner.

MANAGEMENT APPLICATIONS USED

Cisco UCS Manager

UCS Manager functionality runs embedded on each fabric interconnect (in a clustered fashion) and all functions are managed via a single console for server, networking, and storage administrators with full Roles Based Access Control (RBAC). Currently, up to 20 UCS 5108 Blade Server Chassis can be supported by a pair of UCS Fabric Interconnects, allowing up to 160 blades to be deployed and configured via a single UCS Manager instance. This creates a single large "virtual blade chassis" from a management, connectivity, and deployment perspective inside a single domain. Using UCS SingleConnect technology, UCS C-Series Rack Servers can be seamlessly integrated into a UCS Manager instance (domain) and are managed using the same the same console and process. UCS Manager is server form factor agnostic and UCS Service Profiles / Templates can be used for and applied to, both blade and rack servers. An important consideration is that Cisco UCS Manager integrates with industry-leading systems management solutions, which supports the use of existing IT staff, skills, tools,

and processes. A comprehensive, open XML API for UCS Manager exposes 9,000 points of integration and facilitates custom development to achieve new levels of system visibility and control. For more information, see www.cisco.com/en/US/products/ps10281/index.html.

Cisco UCS SingleConnect

Cisco SingleConnect Technology solution eliminates many of the traditional time-consuming, manual, and error-prone tasks required to connect, deploy and manage servers and virtual machines in the data center. UCS with SingleConnect is self-integrating, with automated and dynamic configuration of servers, server I/O and networking components over a single common connection. UCS centralizes administration, eliminating dozens of switching and server management points found in traditional environments, while radically reducing cable management and complexity. A single connection can integrate LAN, SAN, and management networks for up to 160 rack and/or blade servers, into a single UCS Manager instance.

SingleConnect technology creates a virtualization-aware system, providing seamless VM mobility and advanced security capabilities for multi-tenant environments. I/O capacity is dynamically allocated across physical and virtual machines in the system in accordance with QoS and network policies, eliminating the need for manual intervention and simplifying troubleshooting. Deterministic, loss-less, low-latency switching delivers industry leading bare metal and virtualized performance for traditional, multi-tier application, big data, and cloud environments.

You can find out more about Cisco UCS SingleConnect at http://www.cisco.com/en/US/prod/ps10265/singleconnect.html.

HP Virtual Connect

HP Virtual Connect Manager (VCM) is a Web console integrated into the firmware of Virtual Connect (VC) Ethernet modules. HP VCM can connect to a single HP Virtual Connect domain, or HP c-Class BladeSystem enclosure. To manage multiple BladeSystem enclosures, you must use Virtual Connect Enterprise Manager, which is licensed per chassis, so a license must be purchased for every BladeSystem c-Class enclosure. HP VCM does not have the ability to incorporate or manage rack servers.

For more information, see h17007.www1.hp.com/us/en/enterprise/servers/bladesystem/virtual-connect/index.aspx#tab=TAB1.

HP Onboard Administrator

HP Onboard Administrator is a module that shipped with the HP BladeSystem c-Class enclosure. The module offers a Web based remote access for overall management of the c-Class infrastructure in which it is installed. Onboard Administrator communicates with the installed blades' HP Integrated Lights-Out (iLO) to allow

interaction with each blade. The HP BladeSystem c-Class enclosure ships with one Onboard Administrator module. A second management module may be purchased and installed to enable redundancy.

For more information, see h18004.www1.hp.com/products/blades/components/onboard/index.html?jumpid=reg_R1002_USEN.

HP Integrated Lights-Out

HP Integrated Lights-Out (iLO) is an embedded management technology that allows interaction and management of the HP ProLiant servers. iLO offers Web-based remote management to show several aspects of the server including health, inventory, and power management. It also allows a remote KVM console with HP iLO Standard for BladeSystem license, but requires purchase of an Advanced license to gain all remote console features including directory services integration.

Note: iLO Advanced is required to enable additional features and functionality that are included in Cisco UCS Manager. For more information, see h17007.www1.hp.com/us/en/enterprise/servers/management/ilo/index.aspx#.UfgtNWSDRM8.

SUMMARY

As your IT organization grows, migrating server identities between servers with data ownership, regardless of form factor, is a critical capability. Workload demands and data center realities will mandate that maximum flexibility be “built-in” to the architecture and management processes to optimize performance and productivity. Making server migration seamless and repeatable requires that it be a largely automated process. Automation is critical to maintain maximum uptime, reduce the burden on your IT staff’s time, and to reduce the potential for human error. All of these make your enterprise more efficient, resilient, and sustainable.

The Cisco Unified Computing System and UCS SingleConnect make such a scenario possible. UCS Manager’s automated processes let you migrate identities between servers seamlessly within your existing infrastructure, letting your IT staff take a largely hands-off approach. Fewer touch points mean less time spent on the process and less chance of error. In our tests, migrating from a blade server to a rack server with the Cisco UCS solution was 34 percent faster and required 83 percent fewer steps than with the HP solution.

APPENDIX A – MIGRATION PROCESS

Figure 4 shows some of the aspects that are important for a server migration process. This table lists which steps are automated and which are manual operations, by vendor solution.

System	Cisco UCS migration	HP migration
BIOS settings		
General BIOS settings	Automatically configured	Manual configuration
Boot order	Automatically configured	Manual configuration
Out of band access (KVM) and virtual media	Automatically configured	Manual configuration, additional licensing
Operating System		
Shutdown OS on existing server	Automatically	Manual
Boot OS on new server after migration	Automatically	Manual
MAC Address, OS NIC re- enumeration	Automatically configured	Manual configuration
Storage configuration		
Zone Fibre Channel ports	N/A Uses converged infrastructure	Manual configuration
Fibre WWPN	Automatically transferred	New address, Manual configuration
Configure Initiator	Automatically transferred, no configuration needed	Manual configuration
Configure Host name	Automatically transferred, no configuration needed	Manual configuration
Edit storage group	Automatically transferred, no configuration needed	Manual configuration
Network configuration		
Configure switch ports	N/A Uses converged infrastructure	Manual configuration
NIC partitioning	Automatically configured, hardware layer	Manual configuration, software teaming utility
Configure VLAN and MTU size	Automatically configured	Manual configuration
Cable Out of band access	N/A Uses converged infrastructure	required

Figure 4: Cisco UCS Service Profiles and HP solution Server Profiles.

APPENDIX B – TEST BED

Figure 5 shows the test bed we used. Note: There are two connections from each device to the Cisco Nexus 5010 and Cisco 9134 MDS. In a typical environment, there would be two Cisco Nexus 5010s and two Cisco 9134 MDSs for redundancy.

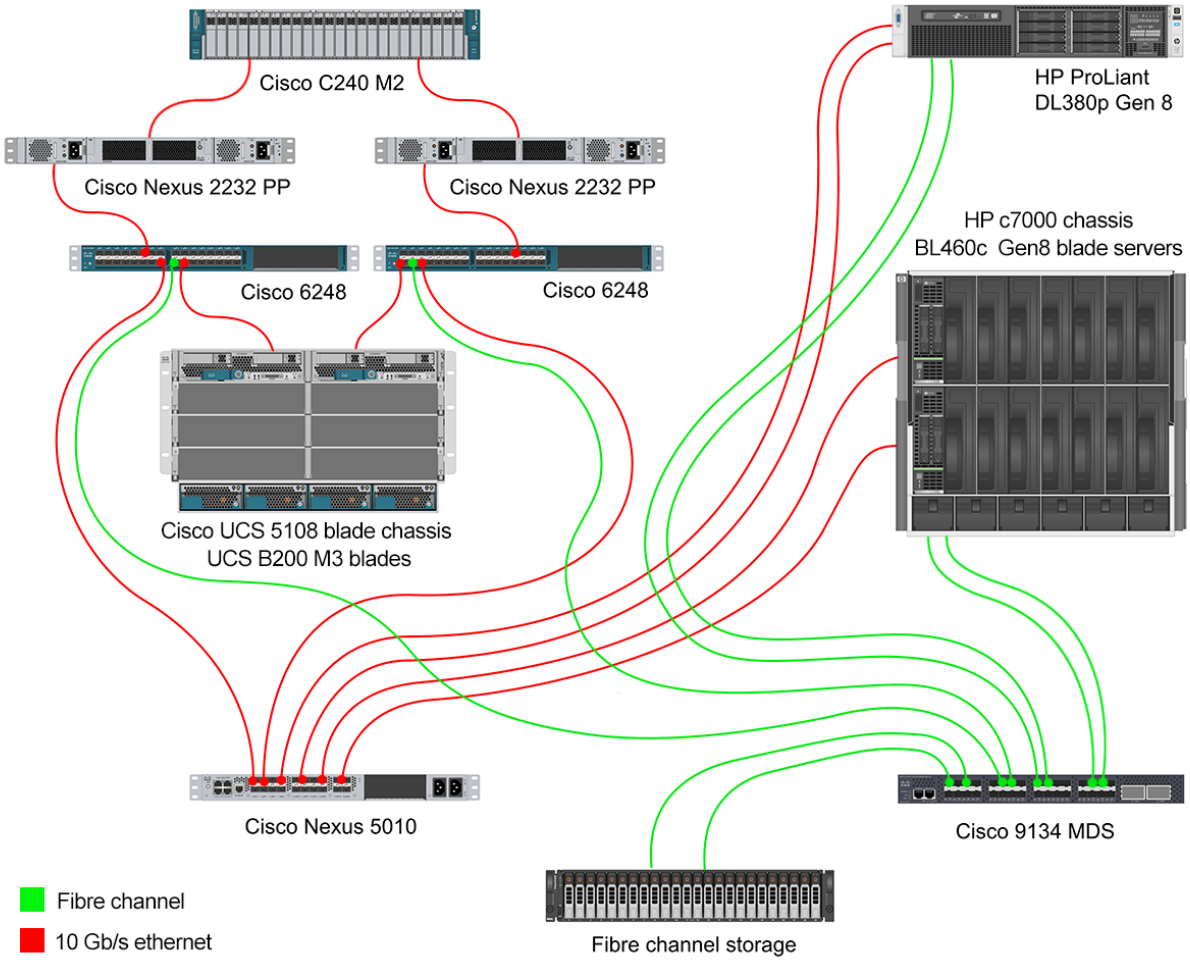

Figure 5: Test bed diagram.

APPENDIX C – TEST METHODOLOGY

Figure 6 provides the steps we followed and total time to migrate data from a blade server to the rack server. Fewer steps and less time demonstrate a higher level of operational efficiency.

Prior to performing the steps below, we configured a Cisco UCS B200 M3 Blade Server and HP ProLiant BL460c Gen8 Blade Server with VMware ESXi 5.1.0 with a boot from SAN configuration. Note that we stopped timing when each server finished booting from SAN and was at the ESXi main screen.

<table>
<tr><th colspan="2">Migrating data from a blade server to a rack server</th></tr>
<tr><th>Cisco UCS C240 M3 Rack Server</th><th>HP ProLiant DL380p Gen8 Server</th></tr>
<tr><td>Migrate boot from SAN OS from Cisco UCS B200 M3 to Cisco UCS C240 M3 Rack Server using Service Profile (time 8:43)

Note: The Cisco service profile migration automatically shuts ESXi down on the B200 M3 and then boots the OS on the C240 M3, so no user integration is required with ESXi. Because the UCS Service profile migrates the WWPN from one system to the other, no configuration is required on the storage.

1. Select the Servers tab in Cisco Unified Computing Manager.
2. Right-click the Cisco UCS C200 M3 Blade Service Profile, and select Change Service Profile Association from the drop-down menu.
3. Choose Select existing Server.
4. Select the C240 M3 server, and click OK.
5. Select the FSM tab for the C240 M3 server, and wait for transfer to complete.
6. Open a remote session In the UCS Manager, and click the Server tab→Server 1→KVM. (Note: We stopped recording time when the server finished booting from SAN and was at ESX main screen.)</td><td>Log into HP BladeSystem Onboard Administrator and shutdown OS on the HP ProLiant BL460c Gen8 Server Blade (time 1:47)

1. Log into HP BladeSystem Onboard Administrator.
2. Expand Device Bays→Blade 1 and iLO.
3. Click Integrated Remote Console.
4. In the console, click Shut down ESXi, and wait for system to shut down.

Note: We do not include the steps in this section in our total results.

Configure the storage with the HP ProLiant DL380p Gen8 Fibre WWPN, add the DL380p Gen8 server to the boot LUN, and remove HP ProLiant BL460c Gen8 from the boot LUN

Note: The configuration process can vary quite a bit between different storage platforms. The steps below are meant as general overview of what must take place to show that interaction with the storage will be required on the HP migration. The actual number of steps and time will vary considerably from what is listed.

1. Register the WWPN initiator in the storage, and assign it a host name.
2. Add the DL380p Gen8 host name to the ESXi boot LUN.
3. Remove the BL460c Gen8 host name from the LUN.

Configure the HP ProLiant DL380p Gen8 server's Fibre controller to boot from SAN (time 4:04)

1. Log into iLO management for HP ProLiant DL380p Gen8.
2. Click Remote Console→Remote Console, and launch remote console.
3. Click Power Switch→Momentary Press to power on the server.
4. Press CTRL-Q when the Fibre controller post.
5. In the QLogic Fast!UTIL select the first adapter, and press Enter.</td></tr>
</table>

Migrating data from a blade server to a rack server	
Cisco UCS C240 M3 Rack Server	**HP ProLiant DL380p Gen8 Server**
	6. Select Configuration Settings→Adapter Settings from the options menu. 7. Enable Host Adapter BIOS, and press Esc. 8. Choose Selectable Boot Settings, and press Enter. 9. Change Selectable Boot to Enabled. 10. Arrow down to first boot LUN, and press Enter. 11. Select the SAN device ID, and press Enter. 12. Press Esc twice, and save changes. 13. Highlight Select Host Adapter, and press Enter. 14. Select the second host adapter, and press Enter. 15. Select Configuration Settings→Adapter Settings from the options menu. 16. Enable Host Adapter BIOS, and press Esc. 17. Choose Selectable Boot Settings, and press Enter. 18. Change Selectable Boot to Enabled. 19. Arrow down to the first boot LUN, and press Enter. 20. Select the SAN device ID, and press Enter. 21. Press Esc twice, and save changes. 22. Exit Fast!UTIL, and reboot server. **Change the HP ProLiant DL380p Gen8 server's BIOS boot order to boot from SAN *(time 6:53)*** 1. Press F9 when it posts. 2. In BIOS, set Power Management Options→HP Power Profile to Maximum Performance. 3. Adjust Boot Controller Order so the Fibre adapter is the first boot controller. 4. Press F10 to exit and reboot. (Note: We stopped the timer when the server finished booting from SAN and was at ESX main screen.) **Configure the HP ProLiant DL380p Gen8 server's network configuration inside OS. *(time 0:38)*** 1. Press F2 at ESXi main boot screen. 2. Enter login and password, and press Enter. 3. Select Configure Management Network→Network Adapters, and press Enter. 4. Select the correct network adapter for management network, and press Enter. 5. Press ESC, and type `Y` to restart network services. 6. Press ESC to return to ESXi main screen.
Total number of steps for migration: 6 **Total time for migration: 8 min., 43 sec.**	**Total number of steps for migration: 36** **Total time for migration: 13 min., 22 sec.**

Figure 6: Steps required when migrating data from a blade server to a rack server with Cisco and HP solutions. Fewer steps and less time are better.

APPENDIX D – BLADE SERVER CONFIGURATION

Figure 7 provides detailed configuration information about the blades servers from which we migrated.

System	Cisco UCS B200 M3 Blade Server	HP ProLiant BL460c Gen8 Server Blade
Enclosure/chassis		
Blade enclosure/chassis	Cisco UCS 5108 Blade Server Chassis connected to 2x Cisco UCS 6248UP Fabric Interconnects	HP BladeSystem c7000 Enclosure with 2x HP Virtual Connect FlexFabric 10Gb/24-port Modules
Chassis power supplies		
Total number	4	6
Maximum wattage of each (W)	2,500	2,400 Platinum
Chassis cooling fans		
Total number	8	10
Dimensions (h x w) of each	3-5/8" x 5-1/2"	4" x 4"
General		
Number of processor packages	2	2
Number of cores per processor	8	8
Number of hardware threads per core	2	2
CPU		
Vendor	Intel®	Intel
Name	Xeon®	Xeon
Model number	E5-2690	E5-2690
Stepping	C1	C1
Socket type	LGA2011	LGA2011
Core frequency (GHz)	2.90	2.90
Bus frequency (GT/s)	8.0	8.0
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 (MB)	20	20
Platform		
Vendor and model number	Cisco UCS B200 M3 Blade Server	HP ProLiant BL460c Gen8 Server
Motherboard model number	UCSB-C200-M3	HP 654609-001
BIOS name and version	Cisco S5500.1.3.1C.0.052020102031	HP I31 12/14/2012
BIOS settings	Power policy set to Max Performance	Power policy set to Max Performance
Memory module(s)		
Total RAM in system (GB)	128	128
Vendor and model number	Samsung® M393B1K70DH0-YH9	Samsung M393B1K70DH0-YH9
Type	DDR3 PC3L-10600R	DDR3 PC3L-10600R
Speed (MHz)	1,333	1,333
Speed running in the system (MHz)	1,333	1,333
Size (GB)	8	8
Number of RAM module(s)	16	16
Rank	Dual	Dual

System	Cisco UCS B200 M3 Blade Server	HP ProLiant BL460c Gen8 Server Blade
Chip organization	Double-sided	Double-sided
Hard disk		
Vendor and model number	Toshiba® A03-D300GA2	HP EG0300FBDSP
Number of disks in system	2	2
Size (GB)	300	300
Buffer size (MB)	16	16
RPM	10,000	10,000
Type	SAS	SAS
Controller	LSI™ MegaRAID® SAS 2004 ROMB	HP Smart Array P220i
Network adapter (mezzanine card)		
Vendor and model number	Cisco UCS Virtual Interface Card 1240	HP FlexFabric 10GB dual-port adapter #647584-001

Figure 7: Detailed configuration information for the servers.

APPENDIX E – RACK SERVER CONFIGURATION

Figure 8 provides detailed configuration information about the rack servers.

System	Cisco UCS C240 M3 Rack Server	HP ProLiant DL380p Gen8 Server
Power supplies		
Total number	2	2
Maximum wattage of each (W)	650	750
Chassis cooling fans		
Total number	6	6
Dimensions (h x w) of each	2-1/2" x 2-1/2"	2-1/2" x 2-1/2"
General		
Number of processor packages	2	2
Number of cores per processor	8	8
Number of hardware threads per core	2	2
CPU		
Vendor	Intel®	Intel
Name	Xeon®	Xeon
Model number	E5-2690	E5-2690
Stepping	C1	C1
Socket type	LGA2011	LGA2011
Core frequency (GHz)	2.90	2.90
Bus frequency (GT/s)	8.0	8.0
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 (MB)	20	20
Platform		
Vendor and model number	Cisco UCS C240 M3 Rack Server	HP ProLiant DL380p Gen8 Server
Motherboard model number	UCSB-C240-M3	HP 654609-001
BIOS name and version	Cisco C240M3.1.5.1c.0.013120130509	HP P70 12/14/2012
BIOS settings	Default	Changed boot controller order
Memory module(s)		
Total RAM in system (GB)	128	128
Vendor and model number	Samsung® M393B1K70DH0-YH9	Samsung M393B1K70DH0-YH9
Type	DDR3 PC3L-10600R	DDR3 PC3L-10600R
Speed (MHz)	1,333	1,333
Speed running in the system (MHz)	1,333	1,333
Size (GB)	8	8
Number of RAM module(s)	16	16
Rank	Dual	Dual
Chip organization	Double-sided	Double-sided
Hard disk		
Vendor and model number	Toshiba®	HP EG0300FBDSP
Number of disks in system	2	2

System	Cisco UCS C240 M3 Rack Server	HP ProLiant DL380p Gen8 Server
Size (GB)	300	300
Buffer size (MB)	16	16
RPM	10,000	10,000
Type	SAS	SAS
Controller	LSI™ 6G MegaRAID® SAS 9266-8i	HP Smart Array P420i
Network adapter		
First adapter		
Vendor and model number	Cisco UCS Virtual Interface Card 1225	HP Ethernet 1Gb 4-port 331FLR
Type	PCI Express	Integrated
Second adapter		
Vendor and model number	N/A	Intel dual-port 10Gb SFP+ adapter
Type	N/A	PCI Express
Fibre adapter		
Vendor and model number	N/A	QLogic QLE2562
Type	N/A	PCI Express

Figure 8: Detailed configuration information for the rack servers.

APPENDIX F – UCS MANAGER SERVICE PROFILE SETTINGS, PARTIAL LIST

According to Cisco, with UCS Manager Service Profiles, you can manage over 127 different server identity parameters. Figure 9 presents a partial list of the settings available with Cisco UCS Service Profile.

Cisco UCS Service Profile settings - Partial list				
Server setting	**Capability**		**Server setting**	**Capability**
Scale per Mgmt instance	160 servers per domain (blade/rack); 10,000 with UCS Central		Number of vNICS created	YES; up to 256
Movement between chassis	YES		Number of vHBAs created	YES
BIOS settings	YES; 48 BIOS settings		QoS settings	YES
Server UUID	YES		NIC adapter settings	YES
Host BIOS firmware	YES		HBA adapter settings	YES
Enet firmware	YES		Remote Mgmt Controller firmware (CIMC, iLO, iDRAC)	YES
Hardware NIC teaming (fabric failover)	YES		vHBA WWPN assignment	YES
FC adapter firmware	YES		vHBA WWNN assignment	YES
Storage controller firmware	YES		HBA FC SAN membership	YES
PCIe bus scan order	YES		FC boot parameters	YES
PCIe device slot placement	YES		iSCSI boot parameters	YES
BIOS scrub actions	YES		VLAN assignment per NIC	YES
Disk scrub actions	YES		VLAN tagging per NIC	YES
Remote Mgmt Controller firmware (CIMC, iLO, iDRAC)	YES		Virtual server serial number	No
IPMI settings	YES		NIC transmit rate	YES
Boot order	YES		NIC receive rate	YES
Power Control policy and capping	YES		NIC MAC assignment	YES
Local storage RAID configuration	Yes		NIC MTU size	YES
Dynamic vNICs (VM FEX)	YES		Serial over LAN settings	YES

Figure 9: Partial list of Cisco UCS Service Profile settings.

ABOUT PRINCIPLED TECHNOLOGIES

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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, Web sites, 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.