Efficiency in systems management is a fundamental requirement in today's data centers. As virtual environments add additional layers of complexity to an environment, streamlining necessary but repetitive management tasks for the system administrator saves time and frees resources for more strategic tasks. Many solutions on the market allow administrators to perform common system management functions, such as performing hypervisor deployments and firmware upgrades on your servers, but which solution provides the best integration with the centralized management consoles your administrators already use? How do you determine which integrated systems management solution offers the most streamlined and efficient methods? To answer these questions, we analyzed the hypervisor deployment and firmware upgrade capabilities of the Dell Management Plug-In for VMware vCenter Server, as compared to HP Insight Control for vCenter Server.

Our findings show that the Dell Management Plug-In for VMware vCenter required 76 percent less hands-on administrator interaction than did HP Insight Control for vCenter Server when deploying VMware vSphere, with an overall deployment time that was up to 1.3 times faster. By leveraging the embedded management features of the Lifecycle Controller 2 and Integrated Dell Remote Access Controller 7 (iDRAC7), the Dell Management Plug-In for VMware vCenter allowed administrators to update the firmware of servers from within the VMware vCenter Server console.

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.

DELL LIFECYCLE CONTROLLER 2 AND VMWARE VCENTER SERVER INTEGRATION SIMPLIFIES SYSTEMS MANAGEMENT

Lifecycle Controller 2 and Dell Management Plug-In for VMware vCenter

In complex virtualized environments, the ability to perform common tasks, such as hypervisor deployment and firmware upgrades, from a centralized management console is an enormous advantage of any hardware-software partnership. VMware vCenter Server, the flagship management console in VMware vSphere environments, is the interface in which virtualization administrators spend most of their day. To simplify and streamline systems management of Dell infrastructure running VMware vSphere, Dell provides the Dell Management Plug-In for VMware vCenter, a powerful tool from which firmware upgrades can be deployed, new hypervisor deployments can be performed, hardware profiles configured, and more.
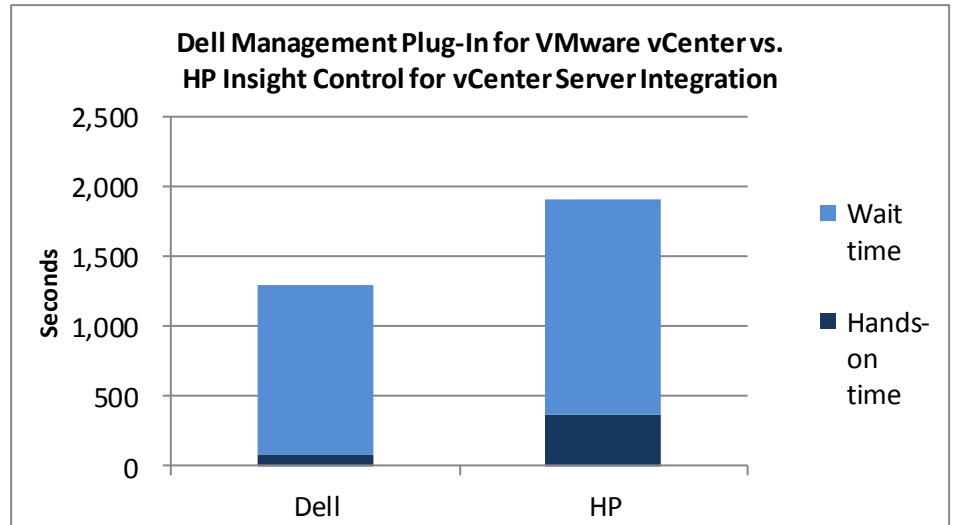
The Dell Management Plug-In for VMware vCenter communicates directly with the heart of 12th generation Dell PowerEdge servers' automated systems management—the embedded Lifecycle Controller 2. Working in conjunction with the Integrated Dell Remote Access Controller 7, Lifecycle Controller receives and implements instructions from the Dell Management Plug-In for VMware vCenter to configure systems.

In our tests, we compared the Dell Management Plug-In for VMware vCenter to HP Insight Control for vCenter Server in two scenarios: deployment of VMware vSphere and updating firmware from within a vCenter Server console. Our results showed Dell's solution decreased the amount of time necessary— both hands-on administrator time as well as total time—to deploy VMware vSphere and upgrade firmware, all from within the centralized vCenter Server console.

Dell Management Plug-In for VMware vCenter required 76 percent less hands-on time

The Dell Management Plug-In for VMware vCenter required 76 percent less hands-on administrative time than HP Insight Control for VMware vCenter when deploying VMware vSphere 5 update 1, and overall it completed the entire installation 1.3 times faster. The Dell Management Plug-In for VMware vCenter also provided notifications and job status updates within the VMware vCenter Server console, a welcome feature for administrators, while HP Insight Control for VMware vCenter failed to update the job status for hypervisor deployment within the VMware vCenter Server console. This lack of updates forces the administrator to monitor the progress of the deployment using another tool external to the vCenter Server console.

Figure 1: Dell Management Plug-In for VMware vCenter hypervisor deployments complete faster and with less administrative hands-on time.

Console BIOS and Storage Controller Firmware Updates	Hands-on time	Wait time	Total time
Dell Management Plug-In for VMware vCenter	85	1,214	1,299
HP Insight Control for vCenter Server Integration	362	1,552	1,914

Figure 2: Hands-on and wait time to update firmware 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.

Dell Management Plug-In for VMware vCenter offers a simple approach to manageability

The systems management integration from Dell used approaches that allowed an operator to perform most of the necessary configuration tasks before deployment, meaning the administrator can "set it and forget it." For example, the Dell Management Plug-In for VMware vCenter automatically configured the hostname, IP address, and DNS server settings based on the operator's inputs provided during job creation, and automated the addition of the host to the vCenter Server. HP Insight Control for VMware vCenter server failed to configure the target server automatically, and required extra operator intervention to complete the host configuration.

In addition, we found that the Dell Management Plug-In for VMware vCenter automatically managed a newly deployed host using its iDRAC connection with no additional configuration, while HP Insight Control for VMware vCenter required additional administrative tasks to associate the Integrated Lights Out (iLO) address and vCenter Server. These additional administrator interventions add extra tasks onto administrators during their deployment cycles, and can extend change and release management windows during the implementation of new virtual environments.

Setup and component simplicity

Functionality is not the only area of concern in selecting a hardware platform. How easy the management infrastructure is to install and maintain is a key element in a business's decision-making process. The vCenter integration solution from Dell addresses these areas of concern with a design that provides functionality, ease of manageability, and simplicity. The installation and configuration for the Dell Management Plug-In for VMware vCenter took less than 30 minutes, while the installation and configuration for HP Insight Control for VMware vCenter Server took more than 12 hours to complete.

The Dell Management Plug-In for VMware vCenter solution consisted of a single virtual appliance, downloadable from Dell as an Open Virtualization Format (OVF) template, and required no additional prerequisites and only an existing VMware vSphere server on which to reside. Once the appliance was imported, configuration consisted of logging into the appliance console to change the administrator password, provide a static IP address, and provide connection licenses. Once the setup was complete, an administrator could perform all Dell hardware management tasks and job configuration from within the vCenter Server console.

Figure 3: The implementation of the Dell Management Plug-In for VMware vCenter involves a single virtual appliance in OVF format, while HP Insight Control for VMware vCenter requires many components and dependencies.

Dell solution — DELL MANAGEMENT PLUG-IN FOR VMWARE VCENTER

HP solution — HP SYSTEM INSIGHT MANAGEMENT / HP INSIGHT CONTROL DEPLOYMENT SERVER / HP INSIGHT CONTROL DEPLOYMENT SERVER LICENSES / HP INSIGHT CONTROL LICENSE / HP INSIGHT CONTROL DEPLOYMENT SERVER CONNECTOR / MICROSOFT SQL SERVER / MICROSOFT .NET FRAMEWORK 4.0 / WINDOWS SERVER 2008 R2 / SERVER WITH 2GB RAM AND 2.0GHz PROCESSOR

HP Insight Control for VMware vCenter Server, in contrast, required configuration of additional servers running Microsoft Windows Server operating systems, and additional components such as Microsoft SQL Server, HP System Insight Manager, and HP Insight Control Deployment Server for OS deployment functionality. We had to then allow HP System Insight Manager to complete a discovery and inventory of the infrastructure servers, and bind these components together using the HP Insight

Centralized Systems Management: Dell Management Plug-in for VMware vCenter vs. HP Insight Control For vCenter Server

A Principled Technologies test report **4**

Control Deployment Server Connector application. Having extra components means more maintenance—these extra machines and environments need regular maintenance for security patches and updates throughout the lifecycle of the solution, which undoubtedly increases administrative costs.

Task and job simplicity

Through the use of hardware profiles, the Dell Management Plug-In for VMware vCenter provides a quick method for customizing hardware component settings such as RAID and BIOS configurations during hypervisor deployments. An administrator can capture a hardware profile from any target server that meets the defined compliance rules. This includes unmanaged servers that have no operating system installed, so long as the target server Integrated Dell Remote Access Controller communicates with the Dell Management Plug-In. An administrator can configure any target server with a different hardware setting by making minor changes to the hardware profile stored within the Plug-In.

In contrast, HP Insight Control for vCenter required time-consuming capturing and reapplying of hardware configurations using jobs created within HP Insight Control Deployment Server. Each time an administrator desires a system configuration change, a correctly configured source server must be booted using the Network Boot option, and connected to the Insight Control Deployment Server PXE Module so that those changes can be captured. Making changes in this tedious capture approach introduces potential configuration inconsistencies and delays the administrator.

For example, to test these approaches, we tried a single BIOS configuration change using each set of tools. A single BIOS configuration change using HP tools and methods with HP Insight Control for vCenter took 575 seconds, while the same process using the Dell Management Plug-In for VMware vCenter tools took only 25 seconds.

	Dell Management Plug-In for VMware vCenter	HP Insight Control for vCenter
Deploy ESXi 5.0.0u1	✔	✔
Job status notifications	✔	None provided
Automatic configuration of host	✔	Extra steps required
Automatic management of host	✔	Extra steps required
Hardware profiles	✔	Recapture required
Update firmware	✔	Not yet functional

Figure 4: Dell Management Plug-In for VMware vCenter provides a rich feature set.

Centralized Systems Management: Dell Management Plug-in for VMware vCenter vs. HP Insight Control For vCenter Server

A Principled Technologies test report 5

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 VMware vSphere 5 host containing virtualized support and infrastructure servers; 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 the Dell Management Plug-In for VMware vCenter Server

The Dell Management Plug-In for VMware vCenter 1.5.0 is part of the Dell Integrated Systems Management suite of applications, which Dell designed to help administrators deploy and manage server hardware, operating system software, and other components that comprise their IT infrastructure. The Dell Management Plug-In for VMware vCenter Server provides a central management tool in the VMware vCenter Server console for your hardware and your virtual infrastructure, making it easy to deploy VMs, BIOS, and firmware updates, monitor hardware, and perform provisioning tasks, all using the same user interface.

To learn more about Dell Management Plug-In for VMware vCenter, visit http://content.dell.com/us/en/enterprise/d/virtualization/management-plug-in-for-vmware-vcenter.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 .

Centralized Systems Management: Dell Management Plug-in for VMware vCenter vs. HP Insight Control For vCenter Server

A Principled Technologies test report 6

CONCLUSION

Leveraging the power of the Lifecycle Controller 2 and Dell Management Plug-In for VMware vCenter, Dell made server management simpler and faster in our test scenarios. In our tests, using Dell vCenter integration saved time and required fewer steps when compared to using similar HP vCenter integration solutions. Dell's approach can potentially offer an organization dramatic savings in time and effort over the server lifecycle.

Centralized Systems Management: Dell Management Plug-in for VMware vCenter vs. HP Insight Control For vCenter Server

A Principled Technologies test report **7**

APPENDIX A – DETAILED TEST RESULTS

Our target server for performing Dell server firmware updates and hypervisor 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. The iDRAC7 was licensed with an Enterprise license, configured to use its own dedicated interface, and assigned a static IP address. The Lifecycle Controller used LOM1 for network access, and assigned a static IP address. Both addresses resided on a private network dedicated to Dell testing, with Internet access using a gateway. We used Dell Management Plug-In for VMware vCenter version 1.5.0 build 36 with VMware vCenter Server Version 5.0.0 build 623373 and vSphere Client Version 5.0.0 build 623373 to perform hypervisor deployments and firmware update testing.

Our HP target server for performing hypervisor 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. The iLO 4 was licensed with an ILO 4 Advanced license, and assigned a static IP address. The address resided on a private network dedicated to HP testing, with Internet access using a gateway. We used HP Insight Control for vCenter Server version 7.0.0 in conjunction with VMware vCenter Server Version 5.0.0 build 623373 and vSphere Client Version 5.0.0 build 623373 to perform hypervisor deployments and firmware update testing.

For the HP environment, we had to install additional tools for OS deployment. These tools included HP System Insight Manager 7.1.0 and Insight Control Server Deployment 7.1.0.29, which were installed on a server running Microsoft Windows Server 2008 R2 Standard and Microsoft SQL Server 2012. Additionally, the server required configuration of IIS and .Net Framework 4.0. We installed evaluation licenses for the Insight Control Server Deployment. Upon completion of the installation, an inventory by SIM was completed before installing the HP Insight Control Deployment Sever Connector 7.0, which is required to deploy hypervisor operating systems from within Insight Control for vCenter Server version 7.0.0.

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

Centralized Systems Management: Dell Management Plug-in for VMware vCenter vs. HP Insight Control For vCenter Server

A Principled Technologies test report **8**

Hypervisor deployments using vCenter Server console

These procedures assume Dell hardware profiles have been created, and the appropriate HP Insight Control jobs and configurations have been created.

VMware vSphere 5 deployment using vCenter Server 9 steps (21 min, 39 sec)	VMware vSphere 5 deployment using vCenter Server 20 steps (31 min, 54 sec)

1. Open the VMware vCenter Server client. Click Home. Click the icon for Dell Management Center in the management section.
2. Select Deployment →Deployment Wizard from the menu. Click Add Server.
3. Enter the iDRAC address and logon credentials of target server. Click Add Server. The wizard completes, adding the target server to the deployment console.
4. Click the check box beside the imported server, and click Next. The wizard retrieves available deployment templates. Select the desired deployment template. Ensure the hypervisor template is correct and the hardware profile is "none." Click Next.
5. Select the install location (the local hard drive is the default). Click Next.
6. Enter Server identification information
   a. Click the plus sign to expand the configuration panel.
   b. Enter the fully qualified domain name for the deployment target.
   c. Enter the IP address for the deployment target.
   d. Enter DNS server information.
   e. Click Next.
7. Assign all servers to the same connection profile. Click Next.
8. Select Deploy Server Now, provide a job name, and click Finish.
9. The OS deployment begins at this stage. A system message is generated indicating the job has been created, and the progress can be viewed in the job queue. Click Close to enter the job queue. The server will be automatically added to the vCenter
	1. Boot the target server, selecting Network Boot. Wait for the boot client to finish loading to ensure "wait state."
	2. From the VMware vCenter Server client, click Home, and click HP Insight Management Deployment Wizard in the management section.
	3. Select the host displayed for deployment. Click Next.
	4. Configure the VMware Host Management Interfaces. Enter the desired hostname, domain, and IP address information. Click Next.
	5. Drag the deployment job folder "HPIO Deploy ESX" to host. Click Next.
	6. Enter the credentials for ESX host that will be used to import the server into vCenter Server. Click Next.
	7. Click Finish.
	8. The OS deployment begins at this stage. The Deployment Execution Status screen is displayed.
	9. Log into the target host iLO by launching a Web browser and entering the IP address of the iLO. Enter the login credentials, and press Enter.
	10. At the iLO main page, select the menu item for Remote Console and expand it.
	11. Select Remote Console. Click Launch.
	12. Click on the Remote Console screen to gain mouse and keyboard focus. The deployment job tasks will complete and the server will appear to be available for service. The hostname and IP address information is not configured and will require manual intervention.
	13. Press F2 to customize the system.
	14. Enter the root credentials for the server .Press Enter.
	15. At the System Customization Menu, select Configure Management Network.
	16. Select IP Configuration.

Centralized Systems Management: Dell Management Plug-in for VMware vCenter vs. HP Insight Control For vCenter Server

A Principled Technologies test report **9**

VMware vSphere 5 deployment using vCenter Server 9 steps (21 min, 39 sec)	VMware vSphere 5 deployment using vCenter Server 20 steps (31 min, 54 sec)
Server console at the completion of the job.	17. Select Static IP Address and Network Configuration. Enter the IP address, Subnet Mask, and Default Gateway. Press Enter. 18. Select DNS Configuration. Enter the DNS server address, and the fully qualified domain name (FQDN). Press Enter. 19. Press ESC. 20. Press Y to restart the management network. 21. At the Main Menu, Press ESC to log out of the ESXi host. The server will be automatically added to the vCenter Server at the completion of the job.

Firmware updates using vCenter Server

Dell firmware updates using vCenter Server 8 steps (18 min, 20 sec)	HP firmware updates using vCenter Server n/a
1. From vCenter, select the host and click the tab for Dell Server Management. The Overview dashboard loads. 2. Select the menu item for Firmware. The firmware dashboard loads. 3. Click the link for Run Firmware Update Wizard. The firmware update wizard launches. 4. Choose Update from repository and click Next. The system loads bundles from pre-configured repository defined within the Plug-In administration app. 5. Select the appropriate bundle from the pull-down list and click Next. The system searches the bundle catalog for available updates. 6. Select PERC H710P Mini firmware and click Next. 7. Select Enter maintenance mode, apply updates, then reboot. The checkbox for Exit maintenance mode after updates complete should be checked. Click Finish. The server will reboot and update the selected firmware. Upon completion, the server will automatically return to service.	As of September 2012, the HP Insight Control for vCenter Server plugin provided an interface for performing firmware updates. However, this functionality did not perform as expected, and upon contacting HP support, we learned that this feature is not yet functional.

Centralized Systems Management: Dell Management Plug-in for VMware vCenter vs. HP Insight Control For vCenter Server

A Principled Technologies test report 10

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

Centralized Systems Management: Dell Management Plug-in for VMware vCenter vs. HP Insight Control For vCenter Server

A Principled Technologies test report 11

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		
Hypervisor	VMware ESXi 5.0.0u1	VMware ESXi 5.0.0u1
Source	Dell	VMware HP portal
	http://www.dell.com/support/drivers/us/en/555/DriverDetails/Product/poweredge-r720xd?driverId=F40KH&osCode=EX50&fileId=3007995805	https://my.vmware.com/web/vmware/details?downloadGroup=HP-ESXI-5.0.0-U1-15MAR2012&productId=229
Firmware versions		
Storage controller	21.0.2-0001	2.14

Figure 5: System configuration information for the test servers.

Centralized Systems Management: Dell Management Plug-in for VMware vCenter vs. HP Insight Control For vCenter Server

A Principled Technologies test report **12**

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, 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.