

SigmaUptime

volume 14 number 6



**ENABLING
INNOVATION**

UPTIME

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Simple, agile and flexible converged infrastructure solutions handle a wide range of modern data center workloads.

Technology services to help
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Contact us to learn more.



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Sigma Uptime

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Enabling Innovation

Simple, agile and flexible converged infrastructure solutions handle a wide range of modern data center workloads.

Enterprise IT organizations are transitioning from client/server computing models to what has become known as the “Third Platform” — a style of IT driven by the dynamic confluence of cloud services, mobile devices, social networks and big data. While much of the focus of this structural shift is on leveraging the cloud to deliver applications, content and services, it’s important to remember that the cloud doesn’t eliminate the need for in-house IT infrastructure.

However, the speed and agility demands of the Third Platform are forcing organizations to rethink how they deploy and optimize their compute, storage and networking resources.

“Legacy data center architectures are siloed and monolithic by design, built to address predictable workloads, structured data and dedicated access,” said Allan Doehler, Business Development Manager, Sigma Solutions. “The whole process of provisioning, deploying and managing hardware for individual applications doesn’t work very well in a ‘Third Platform’ environment where you have unpredictable application workloads running on an array of devices on both wired and wireless networks.”

That’s why converged infrastructure platforms are key enablers on the path to this next phase of computing. They provide for fast deployment of hardware while dramatically reducing management complexity, allowing IT

to quickly and reliably handle a wide range of workloads.

Powerful Packages

Converged infrastructures consist of pre-racked and cabled compute, storage and networking components integrated into a unified system. Hardware is preconfigured with virtualization automation, and management tools, an approach that reduces complexity, shortens deployment time, improves management and delivers one-throat-to-choke support.

“These systems can be up and running in hours or days — not weeks or months,” said Doehler. “Add single-pane-of-glass management that cuts across the technology stack, and organizations quickly gain the ability to create virtual resource pools that make adding services and applications faster and easier than ever before.”

Hewlett Packard Enterprise, which actually coined the phrase “converged infrastructure,” has been one of the leaders in this new approach to data center architecture. With its ConvergedSystem portfolio, HPE has created a family of integrated systems that are purpose-built for a wide range of key workloads:

Virtualization. HPE’s preconfigured, modular virtualization systems deliver instant scalability with support for 50 to 1,000 virtual machines. The HPE ConvergedSystem 300, designed to support 50 to 300 virtual machines, comes configured with HPE ProLiant servers. The HPE ConvergedSystem 700 is designed for larger enterprise installations of 100 to more than 1,000 virtual

machines and comes configured with HPE BladeSystem servers. For both models, customers can choose between VMware or Microsoft virtualization environments. Customers of the 700 model can also install their own virtualization software. All of the models are managed from a single console.

Cloud Services. HP ConvergedSystem 700 for Helion CloudSystem 9 lets customers automate, orchestrate and control multiple cloud deployments. HPE’s flagship cloud software, Helion CloudSystem, is also available on HPE’s family of ConvergedSystem StoreVirtual hyper-converged appliances. Helion CloudSystem features a consumer-inspired user interface, simplified management tools and an improved deployment process that enables customers to set up and deploy a complete private cloud environment in just hours, compared to weeks for other solutions. It supports multiple cloud environments, including Amazon Web Services, Microsoft Azure, OpenStack technology and VMware. It also supports multiple hypervisors, including Microsoft Hyper-V, Red Hat KVM and VMware vSphere, as well as bare-metal deployments.

Big Data. HPE ConvergedSystems help organizations efficiently run big data analytics applications at 50 to 1,000 times faster performance and 70 percent lower cost per terabyte than legacy data warehouses. The HPE ConvergedSystem for SAP HANA and HPE ConvergedSystem 300 for Microsoft Analytics are built upon strong partnerships and tightly integrated technology to deliver the industry’s premier high-performance, high-availability unified solution. They’re flexible and scalable, allowing customers to mix data analytics workloads with data ware-

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housing and mission-critical business applications.

Hosted Desktops. Based upon the award-winning HPE Moonshot server, the HPE ConvergedSystem 100 for Hosted Desktops is an all-in-one system that delivers 180 independent desktops for Citrix XenDesktop environments. This first PC on a chip for the data center delivers six times faster graphics performance and 44 percent lower total cost of ownership. Deployment is up to 90 times faster than with traditional desktop PCs.

Growth Expected

Data centers are reaching an unsustainable point — in the next five years, the average enterprise will see data capacities grow more than 800 percent, according to Gartner. Enterprises need to be able to manage this exponential data growth while introducing new applications, such as big data and analytics, using delivery models such as virtualized infrastructure and the cloud. Yet, enterprise innovation is constrained by the complexities of outdated IT.

These constraints explain why 40 percent of enterprise IT users said

they will increase spending on converged infrastructure during Q4 2015, compared to just 17 percent planning increased spending on traditional servers. Speed and ease of deployment of converged infrastructure were the top drivers cited in 451 Research's inaugural *Voice of the Enterprise: Converged Infrastructure* survey.

HPE ConvergedSystem rated most favorably among solutions cited in the survey. With quick deployment, intuitive management and system-level support, the HPE ConvergedSystem portfolio allows IT organizations to shift their focus from systems integration to delivering the applications that power their business.

“Designing, building and managing a conventional IT environment that can meet today's dynamic business needs can be labor-intensive and loaded with risk, complexity and costs,” said Doehler. “The HPE ConvergedSystem approach enables a high-velocity business model that delivers faster time-to-value, reduces costs and risks, and positions customers to move toward Third Platform models that increase competitive advantage.”

Split Clarifies Company Vision, Exec Says

Improved focus and agility are expected to be key byproducts of the Nov. 1 separation of HP into two independent companies. Hewlett Packard Enterprise (HPE) will build upon HP's leading position in servers, storage, networking, converged systems, services and software, while HP Inc. will own and operate market-leading printing and personal systems businesses.

The move comes four years into the 75-year-old company's five-year turnaround plan. Over this time, the company has reignited its innovation pipeline, strengthened its go-to-market capabilities and rebuilt its balance sheet. The company is now positioned to accelerate performance, drive sustained growth and demonstrate clear industry leadership in key areas.

“This separation will enable us to accelerate the turnaround we began four years ago,” said Meg Whitman, who is now President and Chief Executive Officer of HPE and Chairman of the Board for HP Inc. “As two independent, industry-leading companies, Hewlett Packard Enterprise and HP Inc. can drive more focused business strategies, innovation roadmaps and go-to-market models.”

As a sign of this new agility, HPE has made a number of key product announcements since the split. For instance, the company recently introduced new HPE 3PAR StoreServ Storage solutions to accelerate the move to all-flash data centers, and unveiled a portfolio of technologies designed to help organizations use application containers.

“The winners in today's market will be those who apply the power of technology to fuel the power of ideas, and the new Hewlett Packard Enterprise is built to accelerate this journey for customers,” said Whitman.

The ‘Composable’ Infrastructure

While HPE has been at the forefront of the converged infrastructure movement, the company has continued to build on that momentum with an eye toward the data center of the future. Adding hypervisor technology to the integrated hardware in converged platforms, HPE's “hyper-converged” appliances create a powerful but simple virtualization platform.

Now, HPE has developed the “composable infrastructure,” a new architecture that builds upon the converged and hyper-converged platforms with software-driven controls that essentially treat hardware infrastructure as software code.

HPE says this infrastructure is designed around three core principles — fluid pools of resources, a unified API and software-defined intelligence. The unified API powered by HP OneView provides a single line of code to abstract every element of infrastructure. It enables an application to acquire, release and reacquire compute, storage and fabric resources as needed. The software-defined intelligence includes template-driven, single-touch provisioning and management. This allows software to control hardware quickly, programmatically and without human intervention.

HP says moving to a composable infrastructure is an incremental process that will maximize the speed, agility and efficiency of core infrastructure and operations, allowing IT to operate very much like a cloud provider to lines of business and the extended enterprise.



Hewlett Packard
Enterprise



Converge and Conquer

HPE ConvergedSystem portfolio

HPE ConvergedSystem allows you to eliminate the inefficiencies and inflexibility of one-silo-at-a-time infrastructure with software-defined agility and automation. With integrated compute, storage and networking resources, you can set up IT services in minutes, not hours. Workload-optimized systems eliminate infrastructure silos for improved efficiency, simplicity and speed.

Moving to a converged infrastructure ties virtualization, automation, and unified infrastructure management software together into pre-built, tested, and workload-optimized systems. These systems are software-defined for easy integration into existing infrastructure and quick transition to hybrid cloud delivery models.

If new workloads and business demands are pushing the limits of your infrastructure, contact Sigma Solutions and let us demonstrate how fast, easy and cost-effective a shift to HPE ConvergedSystem can be.



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Down to the Wire

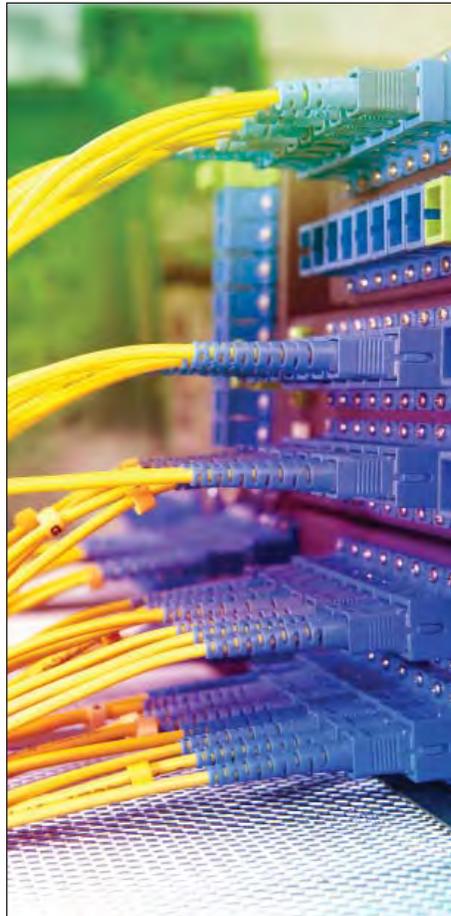
Why high-quality cabling is more important than ever.

Wireless networks have evolved from a “nice-to-have” feature to a mission-critical component of the IT infrastructure. Organizations that depend upon mobile devices are equally dependent upon Wi-Fi — sometimes more than they are the wired network.

But even organizations that rely primarily on wireless still require a high-performance, back-end wired network. In fact, the wired network becomes even more critical. Popular applications such as IP telephony, videoconferencing, digital signage, video surveillance and streaming video require significant bandwidth for a high-quality user experience. The influx of mobile devices onto the corporate network — devices seeking to simultaneously access these applications — can push bandwidth demands to the limits.

When people think about network upgrades they generally consider switches, routers and other gear. Structured cabling is an often-neglected component. It is the foundation that supports and connects most of the network infrastructure, yet it garners just 5 percent of IT investments.

Many organizations expect their cabling plant to last almost indefinitely. But every time an application is added to the network, bandwidth demands increase. If the demands placed on the network go beyond what the infrastructure was designed to deliver and users notice declining performance, it could be a sign that



the cabling plant is in need of an upgrade.

There are many myths and misconceptions surrounding structured cabling. Organizations often view cabling as a “commodity” to be purchased as cheaply as possible. Unfortunately unscrupulous online suppliers promote low-cost cables that do not meet applicable codes and standards requirements. The stakes are high — noncompliant cabling creates a fire risk, particularly when used for Power over Ethernet (PoE) applications.

Proper installation is another concern. Organizations often ask their electrical contractor to pull network

cabling along with other wiring. Just because the cabling is neat and organized, however, does not mean it meets structured cabling standards.

What Is Structured Cabling?

Structured cabling is a comprehensive system of cables and related hardware that provides a flexible, future-ready infrastructure for business communications. This system enables the continuous flow of information, from data and voice to security and wireless connections.

The Electronic Industry Alliance/Telecommunications Industry Association (EIA/TIA) has developed standards for structured cabling in conjunction with the American National Standards Institute (ANSI). Standards are important because they establish technical criteria for the design, installation and documentation of a structured cabling system. This ensures consistent performance, simplifies maintenance and makes it possible to build modular, vendor-agnostic environments that are capable of accommodating new technology and changes to the network.

As IT infrastructures have become denser and more complex, the value of structured cabling has been magnified. Structured cabling uses a modular design that supports new equipment and applications regardless of vendor, making it easier to expand the network to meet growing demands.

Structured cabling also establishes consistency in the network infrastructure, simplifies maintenance and troubleshooting, and reduces total cost of ownership. In fact, the

International Engineering Consortium found that standardizing cabling components and consolidating cable delivery methods reduces initial construction costs by up to 30 percent. It can also cut network maintenance costs by up to 40 percent.

Up-to-date cabling is a must for organizations looking at technology upgrades. For example, 10 Gigabit Ethernet (GbE) technology enables efficient data exchange, simplifies connectivity and administration, and expands bandwidth capacity. This requires a solid cabling plant to take full advantage of the benefits. For organizations making the jump to 40GbE or 100GbE, the performance of fiber-optic cabling is critical.

10GbE is an important consideration for organizations planning to take advantage of the 802.11ac Wi-Fi standard to improve performance and handle increasing wireless traffic volumes. That means the cabling plant often must be upgraded to support the latest wireless network technologies.

Planning Is Key

Many technological upgrades offer only modest performance improvements, but that's not the case with the latest cabling standards. For example, the Category 5 cabling still common in many installations can handle throughput of up to 100Mbps, while Category 6a cabling can handle throughput of up to 10Gbps. To put that into perspective, it takes 10 hours to download a 450MB file over Cat5 but just 6 minutes over Cat6a.

As a result, it's important to understand current cabling trends before moving forward with the design and installation of a structured cabling system. Many organizations are moving from copper to fiber-optic cabling in order to increase data transmission speeds. Thinner, lightweight cables can help improve airflow and make installation and cable management easier.

Proper planning is essential. Cabling systems have a much longer life-cycle than most other components of the IT environment — typically 15 to 20 years. It's important to think about the number of users, the location of those users, and how much bandwidth will be required to meet growing demands. Organizations should also consider the need for additional wireless access points, and PoE support for IP telephony, video surveillance and other devices attached to the data network.

A certified structured cabling contractor can provide invaluable input during the planning stage, helping to develop bid specifications, conduct a planning, budgeting and engineering review, and ensure that the construc-

tion plan is EIA/TIA-compliant. Organizations should look for engineers who are Building Industry Consulting Service International (BICSI) certified and carry the Registered Communications Distribution Designer (RCCD) designation. Installation should be handled by manufacturer-certified technicians.

Although many organizations are increasing their reliance on wireless technologies, the cabling plant plays an increasingly vital role in network performance, manageability and scalability. Whether moving to a new location or upgrading existing facilities, organizations should lay the proper foundation by investing in high-quality structured cabling.

The Six Subsystems of Structured Cabling

Structured cabling standards subdivide each system into six components:

Horizontal Cabling. Most cables are part of this system, including voice, data, multimedia, security and others. The horizontal cabling system is comprised of components between the telecommunications rooms and the work area outlets, including telecommunications outlets and connectors, cross connects, patch cords and consolidation points.

Backbone Cabling. Serving as the core information channel, backbone cabling includes cabling that connects telecommunications and equipment rooms and entrance facilities within the building. It also includes cabling that connects separate buildings.

Telecommunications Room. Termination equipment that connects horizontal and backbone cabling is typically housed in the telecommunications room, which should be on the floor it serves. This includes intermediate and main cross-connects, patch cords, connecting equipment and auxiliary equipment.

Work Area. This area is comprised of the components that connect the telecommunications outlet with the user's workstation equipment, including outlets, patch cables and adapters. This may also include workstation devices such as computers, phones and printers.

Equipment Room. This room houses telecommunications systems such as servers, routers, switches and mechanical terminations. The equipment room can replace the telecommunications room and serve as the entrance facility. Each facility should have at least one equipment room.

Entrance Facility. Cable from the outdoor plant meets the building's backbone cabling in the entrance facility. Essentially, this is where the service provider system ends and the system owned by the organization begins. Cables, connecting hardware and protection devices are included in the entrance facility.

Better Backup

Cloud and virtualization-specific backup options help overcome the limitations of traditional solutions.

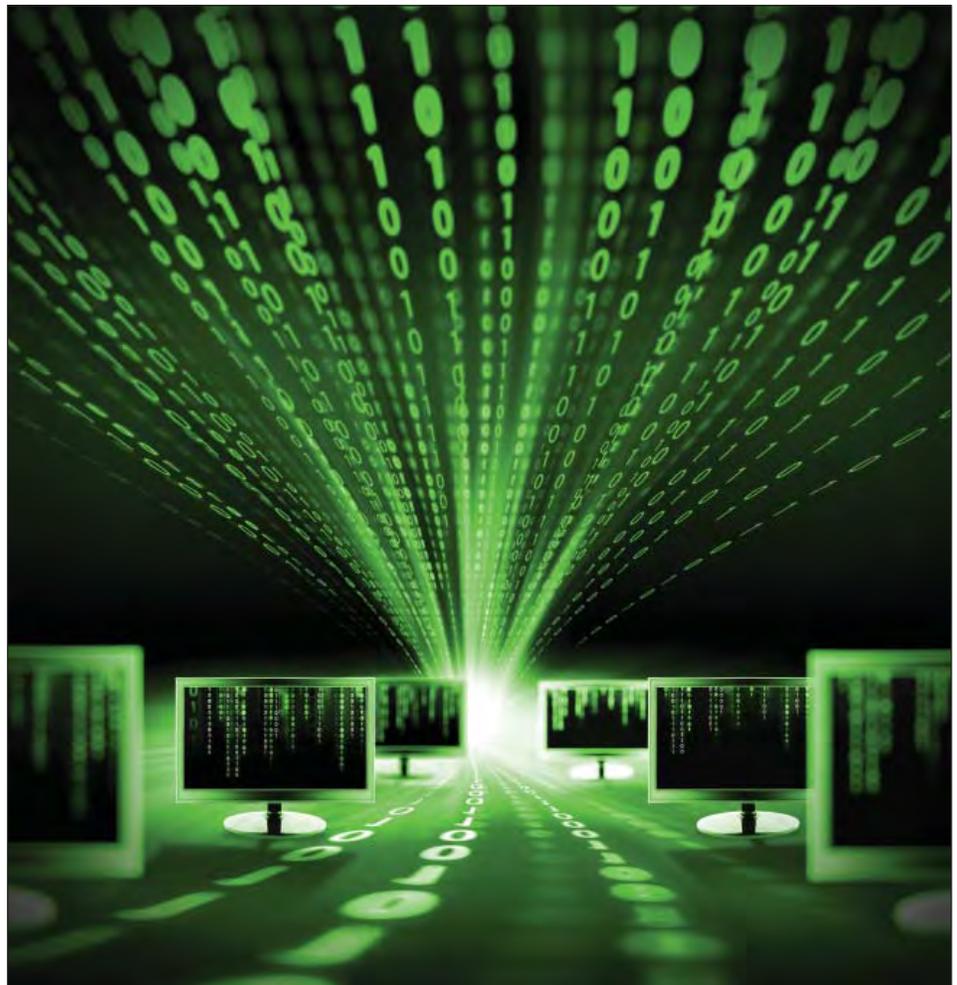
Data backup is arguably the most critical function in IT, but it continues to be a frustrating and problematic process for most organizations. Although backup products and technologies are continually evolving, industry surveys repeatedly reveal that organizations of all sizes are encountering significant backup issues related to cost, complexity and reliability.

Too often, backup technologies and processes have not kept pace with growing data volumes, making it difficult to complete backups within the available window. Increased adoption of server virtualization and cloud-based services have only exacerbated the problem.

“It’s a different world for IT managers today, and data backup ... is more complex than ever,” said Eric Burgener, IDC research director. “Data sizes and types continue to evolve, as does the number of servers and operating systems each company uses. This leads to a host of new challenges IT managers face to make sure they can back up and protect their data and restore operations quickly.”

The Game Changer

Backup was a reasonably straightforward affair in the days when applications ran on dedicated servers. Once an application triggered a backup process, most of the server’s memory, storage and CPUs were available to the backup application. Server virtualization changed all that by allowing multiple virtual machines (VMs) to run on a single piece of hardware. Resource contention becomes a serious issue when an organization is simultaneously backing up physical, virtual and cloud environ-



ments featuring consolidated workloads and extreme data redundancy. If a hypervisor runs out of memory, it can cause a server crash that can bring down multiple applications.

At the same time, there is more data to be backed up and backups need to be completed more frequently to meet recovery point objectives. The problem becomes exacerbated as the environment scales to hundreds or thousands of VMs sharing a common resource pool. Agent-based backup solutions place a significant burden on host servers and

make it difficult if not impossible to complete backups within the available window.

Virtualization-aware, host-level backup is far superior to agent-based solutions, but it presents a separate set of issues. These solutions typically use snapshots to create image-level backups then track block-level modifications. Challenges arise when VMs are moved from one server to another — a host may be running a different set of VMs than it was when the last backup was made. And while an image-level backup

makes it easier to recover an entire VM, it requires at least a two-step process for file-level recovery.

In this scenario, backup is easy but recovery can be difficult. File-level recovery allows administrators to restore individual files in minutes without the time-consuming process of extracting the full VM image to a local drive. Organizations need this capability to support mission-critical applications running on VMs.

Purpose-Built Solutions

Best-of-breed backup solutions for virtualized environments offer file-level restore as well as replication rollback capabilities, protecting VMs from both hardware failure and software corruption. IT can recover individual items from any virtualized application, on any operating system, without additional backups, agents or software tools.

Virtualization-specific backup and replication gives organizations greater confidence to virtualize enterprise applications such as CRM, ERP and email systems. The ability to restore an entire VM from a backup file in minutes means that users remain productive while IT troubleshoots the issue.

Virtualization-specific solutions with synthetic backup capabilities eliminate the need to run resource-intensive full backups. After an initial full backup, only changes are stored, and a synthetically compiled full backup is available for fast restore at any time. This technique reduces backup time and bandwidth utilization. Incremental changes are tracked to allow for rollback in case of software failure or corruption.

De-duplication further improves backup efficiency. When backing up multiple VMs, de-duplication software stores only one instance of similar blocks, saving time and storage space. This becomes an important issue when backing up VMs created from a single

template, or VMs with significant free space on their logical drives.

With VM replication, copies of mission-critical VMs are mirrored to a spare server and kept in the ready-to-start native format. This capability enables cost-effective disaster recovery for mission-critical applications and data. Should a failure occur, IT can run a VM directly from a compressed and de-duplicated backup file on regular backup storage, either in production or an isolated virtual lab.

The Cloud Option

Under certain conditions, shifting data backup to a cloud provider can be a good option. Cloud-based backup requires no capital investment for equipment and makes backup an operational cost. Software encrypts data for security purposes and automatically backs it up to remote servers. The service provider maintains and monitors the data back-

up plan, and because data is saved at a different location, it's always accessible.

Restoring large amounts of data from the cloud can be time-consuming, however. Hybrid solutions help avert such performance issues by keeping primary storage onsite on disks or NAS appliances and moving secondary storage and data backup to the cloud.

Although data backup is critical to any organization, the process has become painful for most IT departments. Virtualization and cloud services have fundamentally changed the process, making it nearly impossible to manage with traditional backup solutions. Virtualization-specific backup solutions with incorporated de-duplication and VM replication capabilities have become the gold standard — but there are other good options, depending on an organization's specific requirements. For a smaller organization with a modest data footprint, a hybrid cloud backup strategy can deliver compelling economic and management benefits.

Cloud Backup Requires Vigilance

For many organizations, cloud backup is a simple, powerful and affordable solution that solves a significant problem and delivers peace of mind. However, the SANS Institute warns that the security risks involved in transmitting important data across the Internet to an off-site server can't be ignored.

Organizations need to keep security close to their data as it traverses cloud systems by controlling permissions and access to the data as well as encrypting it, according to a report from the cooperative research and education organization.

In a recent survey, the SANS Institute found that reliance on cloud services continues to increase, with organizations moving a broad range of applications and operations to the

cloud. Eighty percent of respondents either have or plan to have a cloud service implementation within the next 12 months.

However, 58 percent said they lack visibility in cloud providers' operations and are unprepared to respond in the event of a breach of cloud-based data.

"Moving collaboration tools, email tools, managed services and backup and recovery to the cloud solves some problems for organizations, but with that increased cloud functionality comes increased security risk," says SANS analyst and survey author Dave Shackleford. "Organizations need integrated monitoring capabilities across their hybrid environments and partnerships with public cloud providers for full-spectrum visibility and response."

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