Tech Outlook

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Easing into the Cloud

EMC VSPEX and Enterprise Hybrid Cloud solutions reduce the cost, complexity and risk of deploying private and hybrid cloud infrastructure.

More and more organizations are exploring the private cloud as a remedy for today's IT operational challenges. At the same time, organizations want to optimize the use of public cloud services in cases where it makes good business sense.

The result of these trends is accelerated adoption of a hybrid cloud model that blends private and public cloud environments. According to research firm MarketsandMarkets, demand for hybrid cloud solutions will grow at a compound annual rate of 27 percent through 2019, far faster than the overall IT market.

"The traditional data center environment does not provide the flexibility and fluid scalability to respond to ever-changing business requirements," said Tommy Whatley, VP of Advanced Services, ProSys. "Data centers have siloed architectures that make provisioning, configuration and management complex.

"The public cloud is more flexible and cost-effective and simpler to implement, but few organizations are willing to move mission-critical data and apps to the public cloud. The private cloud is controlled, reliable and trusted but can be difficult to implement. The hybrid cloud model enables organizations to leverage the best of both worlds."

EMC VSPEX provides customers with a smooth path to the hybrid

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cloud. VSPEX Proven Infrastructure removes the complexity and risk associated with designing, integrating and deploying a private cloud infrastructure, helping to speed deployment while offering flexibility and choice in the underlying technology. VSPEX also serves as the foundation for the EMC Enterprise Hybrid Cloud solution, which integrates technology from EMC and VMware to enable hybrid cloud deployment in as few as 28 days.

"Organizations don't have to choose between the speed and agility of public cloud services and the control and security of private cloud infrastructure," Whatley said. "EMC enables a hybrid cloud architecture that supports both legacy and cloud applications and provides robust security and seamless management."

A Better Way

Cloud computing enables organizations to pool IT resources and allocate them dynamically on demand. Services can be rapidly provisioned and elastically scaled, eliminating the need to overprovision infrastructure to accommodate spikes in demand.

A key feature of cloud computing is on-demand self-service — consumers of IT services can provision the resources they need, typically without intervention from IT. Resource usage is controlled and optimized automatically, and can be monitored, reported and charged back to the consumer of the service.

"The private cloud brings these benefits to a dedicated environment, allowing organizations to maintain control over their data," said Whatley. "As a result, the private cloud model increases the efficiency, scalability and flexibility of the data center, and facilitates the transition to an IT-as-a-Service model. However, most organizations face significant learning curves that hinder their ability to deploy private clouds."

Building a private cloud from the ground up enables organizations to architect an environment that is finely tuned to their business requirements, but a high degree of effort is involved. As a result, many organizations opt to use a reference architecture with tested and validated configurations that best meet the desired use case.

"A reference architecture reduces risk and ensures predictable levels of performance, scalability and availability. It offers flexibility in terms of the technology components while providing the architectural vision, guidance and best practices needed to deploy a private cloud quickly and confidently," Whatley said.

"EMC VSPEX is essentially a blueprint for implementing a proven private cloud solution. Complete configuration and sizing guidelines for common workloads significantly reduce the planning, sizing and configuration burdens associated with private cloud deployments. Customers can choose from best-in-class compute, networking and virtualization technologies backed by EMC's storage and data protection solutions."

The Hybrid Approach

The EMC Enterprise Hybrid Cloud solution is designed to be built on the VSPEX reference architecture. It includes hundreds of workflows based upon common use cases that enable self-service delivery and consumption of IT resources.

Custom-engineered design templates offer predetermined service levels for various applications, with end-to-end testing and validation to ensure all infrastructure components work together. The solution also includes access to a catalog of automated data services and provides interoperability with public cloud solutions built on VMware vCloud Air, Microsoft Azure, AWS and other EMC-powered cloud service providers.

"The EMC Enterprise Hybrid Cloud empowers IT to be a broker of trusted cloud services while maintaining the freedom to choose the management and orchestration technology upon which the hybrid cloud is based," said Whatley. "The result is a hybrid cloud solution capable of supporting traditional and next-gen applications, with a seamless and secure management experience and financial transparency so IT can prove its value to the business."

The integration of EMC Enterprise Hybrid Cloud with VSPEX resources creates a scalable platform with self-service virtual machine provisioning, automation, monitoring and management workflows, and chargeback, backup and disaster recovery policies. This feature-rich functionality reduces costs and the IT operational burden by transforming the way organizations deliver and consume technology resources.

"VSPEX Proven Infrastructure extends an array of services to hybrid cloud deployments, Whatley said. "With VSPEX as the foundation for the Enterprise Hybrid Cloud, organizations gain high levels of availability, automation and cost control.

"EMC VSPEX Proven Infrastructure is a powerful solution that simplifies the deployment of a private cloud and lays the foundation for a hybrid cloud environment. Organizations can tap the benefits of the public cloud model while maintaining tight control of mission-critical applications and data in a private cloud environment."

News Briefs

Cybercrime Fears on the Rise

Three-quarters of leaders from U.S. business, law enforcement and government agencies say they are more concerned about cybersecurity threats than they were a year ago, a recently released survey found. Respondents note that cybersecurity incidents are not only increasing in number but are becoming progressively destructive.

More than 500 respondents shared their views in the 2015 U.S. State of Cybercrime Survey, which was a collaborative effort among PwC, CSO, the U.S. Secret Service and the Software Engineering Institute CERT Division at Carnegie Mellon University.

A record 79 percent of respondents said they detected a security incident in the preceding 12 months. On average, respondents reported 163 security incidents per organization — up from 135 the previous year. Organizations with 10,000 or more employees detected 31 times more incidents than those with fewer than 1,000 employees.

The survey also found that the most frequently cited crimes are those committed from outside an organization. Thirty-one percent of respondents had a phishing attack last year, while distributed-denial-of-service attacks are becoming more severe and ransomware is becoming more prevalent.

Gateways Drive Cloud Storage Growth

As businesses increasingly look to leverage cloud computing strategies to streamline operations and cut capital expenses, cloud storage has become an attractive alternative to traditional on-premises storage. According to a new report from the Research and Markets analyst firm, the global cloud storage market is expected to grow from $18.87 billion in 2015 to $65.41 billion by 2020 with a compound annual growth rate of 28.2 percent.

The firm says the rising need for big data storage is driving growth. The recent development of cloud storage gateways is also having an impact. These gateways are hybrid appliances that combine local storage, data protection functionality and cloud storage to form a cost-effective, collaborative package.

Cloud storage gateways establish compatibility between different protocols used by cloud service providers and enterprises. Gateways facilitate the efficient management of network traffic and storage space across a network. They also ensure that the data stored in a cloud storage infrastructure follow a common protocol and are optimized according to established standards.

Technavio analysts say the cloud storage gateway market alone will top $1.7 billion by 2019.

"Cloud storage helps enterprises in the U.S. minimize their total IT infrastructure spending," said Faisal Ghaus, Vice President of Technavio. "The ability of (cloud storage gateways) to safeguard the data in cloud-based storage is driving the growth of the market."

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Wi-Fi's Next Wave

Latest wireless networking standard delivers speed necessary to support more devices and applications.

The 802.11ac Wi-Fi standard has had a dramatic impact in the two years since its introduction, delivering marked improvements in the speed, availability and reliability of wireless networks. The best is yet to come, however.

Products based on Wave 2 of the wireless standard are now becoming available and promise to deliver even better data rates and throughput. Industry analysts say this will enable organizations to more easily support the growing number of devices connected to their wireless networks, as well as a new generation of high-performance, high-bandwidth applications.

"We need to be able to plan and prepare for devices and services we haven't even seen yet," said Vijay Sammeta, CIO for the city of San Jose, Calif., which recently began installing Wave 2 access points. "Wave 2 represents an investment in a platform that not only meets our current needs, it will also meet those in the future that we can't even predict."

Relieving Bottlenecks

While Wave 1 access points deliver speeds of up to 1.3Gbps, Wave 2 products are capable of almost doubling those speeds to multiple devices at the same time. The ability to wirelessly connect multiple users at full speed is extremely important in high-density environments such as offices, universities, hotels and hospitals — especially during peak times when bandwidth demands are highest.

Wave 2 technology could also quadruple the number of supported users, according to many experts. This is accomplished by using even wider bandwidths, doubling the number of available spatial

streams from four to eight, and introducing multi-user, multiple-input multi-output (MU-MIMO) technology. MU-MIMO creates greater separation between spatial streams and allows multiple data streams to be sent simultaneously on the same frequency channel. MU-MIMO relieves bottlenecks by allowing networks to transmit data to many users simultaneously instead of just one at a time.

While deploying Wave 1 products required minimal upgrades, making the jump to Wave 2 isn't as simple. Although 802.11ac is a wireless standard, the wired network needs to be able to support it. Upgrades to cabling and the network backbone will be necessary to avoid bandwidth bottlenecks.

Upgrade Considerations

Organizations using Gigabit Ethernet technology will have to upgrade to higher capacity switches to support Wave 2 wireless speeds and traffic. New specifications are currently being defined for both 2.5Gbps and 5Gbps Ethernet standards, which would enable organizations to get more bandwidth from existing Cat5e and Cat6 cabling. However, new switches would be needed to deliver faster speeds.

The larger leap is to 10Gbps, which would take full advantage of 802.11ac Wave 2, although it would likely require new cabling. However, an update to the cabling plant may be in order given trends toward ever-greater network speeds. Some companies are already looking at 40Gbps and even 100Gbps to ensure adequate capacity and avoid another upgrade down the road.

Another area that many experts believe will need to be addressed is the edge of the network, where wireless traffic is entering the network through the WAN or the Internet. If these pipes aren't wide enough to support increased wireless traffic, users won't experience the kinds of connection speeds that 802.11ac Wave 2 technology is capable of delivering.

"With the second wave of 802.11ac emerging in the market, network managers have greater choice in how to approach future wireless network upgrades," said Rohit Mehra, vice president, Network Infrastructure, IDC. "Wave 2 brings new capabilities for the WLAN to better serve as a tool for business innovation but may require deeper infrastructure upgrades. Network managers should engage in a thoughtful analysis on how to best deploy 802.11ac Wave 2 and extract maximum value."

Old Reliable

Innovations keep tape an important part of the data storage architecture.

Data storage technology is continually evolving, with software-defined storage, flash storage, cloud storage, object storage and more emerging to meet the demands of non-stop data growth. Through it all, tape has remained a durable and reliable element of the storage environment.

Despite repeated predictions of its impending demise, tape storage is remarkably healthy. More data is being stored on tape media than ever before — in excess of 500 exabytes, according to IT analyst firm Coughlin Associates.

"The fact of the matter is that tape continues to be the medium of choice for the bulk of stored data, and its usage is growing," said Drew Robb, Enterprise Storage Forum.

Significant enhancements in performance, capacity, reliability and usability are breathing new life into the tape industry. This progress has enabled tape to transcend its traditional role as a backup and archival medium to effectively address many new data-intensive market opportunities such as big data, compliance, entertainment and surveillance.

TCO Advantages

Additionally, tape delivers highly favorable economics, particularly when factoring in energy and footprint costs. A recent study by Enterprise Strategy Group found that the total cost of ownership (TCO) of a low-cost SATA disk system was 15 times higher than that of a Linear Tape Open (LTO) tape library system. LTO storage can be as low as 0.8 cents per gigabyte and $8 per terabyte based on the current market price of tape media. And tape doesn't constantly consume power like disk storage does.

"The cost of energy alone for the average disk-based solution exceeds the entire total cost of ownership for the average tape-based solution," said David Reine, senior analyst with The Clipper Group. "Tape, with a more than 60-year history of success in the data center, has evolved to a point where it can be the solution of choice for the preservation of data in every data center. Tape is an obvious solution, so why not use it?"

Growing storage density also contributes to tape's value proposition. Enterprise tape has reached an unprecedented

15TB native capacity, and all signs point to exponential growth rates in the near future. IBM researchers recently announced laboratory experiments in the mind-boggling 220TB range. For perspective, that would represent the text of 220 million books — which would require a bookshelf spanning from Las Vegas to Houston — compressed into a tape cartridge that could fit in the palm of one's hand.

Longevity is another benefit with tape. Manufacturers' specifications indicate that enterprise and LTO tape media has a life span of 30 years or more, with the average tape drive lasting nearly 10 years. By comparison, the average disk lasts only about four years.

Drag-and-Drop Simplicity

Tape is also getting smarter. Linear Tape File System (LTFS), a format developed by IBM in prototype form in 2010, is now becoming a mainstream technology. An open standard supported by LTO drives from any vendor, LTFS allows tape data to be read as just another drive on a network. Users can drag and drop files from the server to tape and can see a list of saved files using a standard operating system directory.

ETH Zurich, a leading international university based in Switzerland, uses LTFS tape technology for central data backup and restore services.

"The average data transfer rate to tape has increased steeply over the years to approximately 60 terabytes daily and our tape library has reached more than 5.5 petabytes. Despite advances in overall storage technology, tape is still a promising media for large amounts of data for its transferability of data in Linear Tape File System applications and its low energy consumption," said Dr. Tilo Steiger, Deputy Head of ITS System Services, ETH Zurich.

LTFS is also being deployed in several innovative "tape as NAS" active archive solutions that combine the cost benefits of tape with the ease of use and fast access times of NAS. The SNIA LTFS Technical Working Group has been formed to broaden cross-industry collaboration and continued technical development of the LTFS specification.

Into the Cloud

IDC analysts say the emergence of LTFS is even pushing tape storage into the cloud. By giving tape the same ability to use and manipulate file data as disk storage, LTFS allows organizations to use tape for more than backups, archives and disaster recovery. It allows tape to become part of an "active" archiving infrastructure in which data can be moved across multiple tiers of media, ranging from cloud to disk to flash to tape. Data can be moved to the most cost-effective tier at any time based upon enterprise policies.

Cloud service providers are also turning to tape to provide long-term storage services to their customers. It allows organizations to gain the low price per gigabyte of tape storage without the acquisition and maintenance costs of owning on-premises tape libraries and autoloaders.

Tape's low cost, ease of use and portability have always made it a good choice for long-term backup. However, innovations over the past several years have yielded unprecedented capacity increases, much longer media life and vastly superior economics compared to any previous tape or disk technology. These changes are allowing organizations to give tape a larger role, creating operational and cost advantages in a new range of applications. While slow recovery speeds make tape inappropriate for top-tier storage requirements, the current trajectory of innovation seems to ensure it will continue to be an instrumental element of the data storage environment for years to come.

Next-Gen LTO Specs Ready for Licensing

The Linear Tape Open (LTO) Program Technology Provider Companies — HP, IBM and Quantum — have announced that the LTO Ultrium format generation 7 specifications are now available for licensing by storage mechanism and media manufacturers.

The new LTO generation 7 specifications more than double the tape cartridge capacity from the previous generation, including capacities of up to 15TB per cartridge when compressed. Large files will also transfer more quickly — LTO generation 7 offers data transfer rates of up to 750MB per second, which can translate to more than 2.7TB of data an hour per drive.

"With the release of LTO generation 7 we are again changing the economics of long-term data retention and archiving," said Chris Powers, Vice President, Data Center Development, HP Storage. "High-performance streaming and the demonstrated data integrity of LTO technology reinforces the proof point that tape remains a very attractive match for long-term storage requirements."

The unprecedented capacity and data transfer rates of LTO generation 7 are made possible by a broad range of technology advancements. The specifications include a doubling of read/write heads in an advanced servo format to help achieve higher track density, which means that more data may be written to the same amount of tape within the cartridge. New formulation advancements provide stronger magnetic properties, also helping to increase capacity.

"LTO 7 further solidifies the modern use case for tape in storage environments," said Jason Buffington, Senior Analyst, Data Protection at Enterprise Strategy Group. "This new generation of tape technology will offer a high level of capacity at a low cost, and with LTFS capabilities, should be considered as a part of any tiered storage management plan."

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