

# SigmaUptime

volume 14 number 2



## Choosing the Right Storage

UPTIME

EMC's broad and deep product portfolio offers unique design characteristics for addressing diverse workloads.

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# BIG DATA. BIG OPPORTUNITY.

Mining stored data is quickly becoming as important as managing it. EMC Isilon scale-out NAS fosters the convergence of data analytics with stored data. Isilon combines modular hardware with unified software to provide a storage foundation for in-place data analysis so you can find patterns in your data to predict behavior, create better products, innovate faster, increase revenue, or cut costs.

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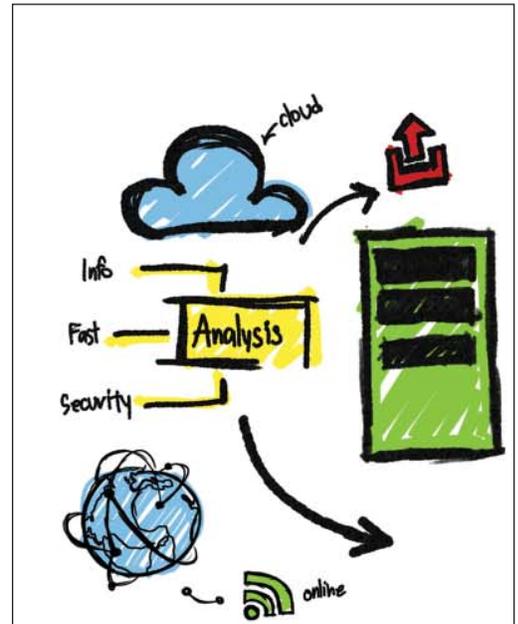
No single storage platform can meet all possible requirements. A range of variables such as workload characteristics, desired performance levels and cost considerations influence storage decisions. EMC's broad and deep product portfolio offers unique design characteristics for addressing these variables.

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Rampant data growth, stringent recovery requirements and regulatory compliance concerns have put a strain on legacy backup and recovery solutions. EMC's Data Protection Suite is a comprehensive solution that addresses these issues and more.

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EMC's VSPEX BLUE hyper-converged solution provides a tightly integrated infrastructure stack that helps simplify today's data center. Building on key virtualization concepts, it integrates virtualization, compute, networking, storage and data protection into a single, all-inclusive appliance.



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## Sigma Uptime

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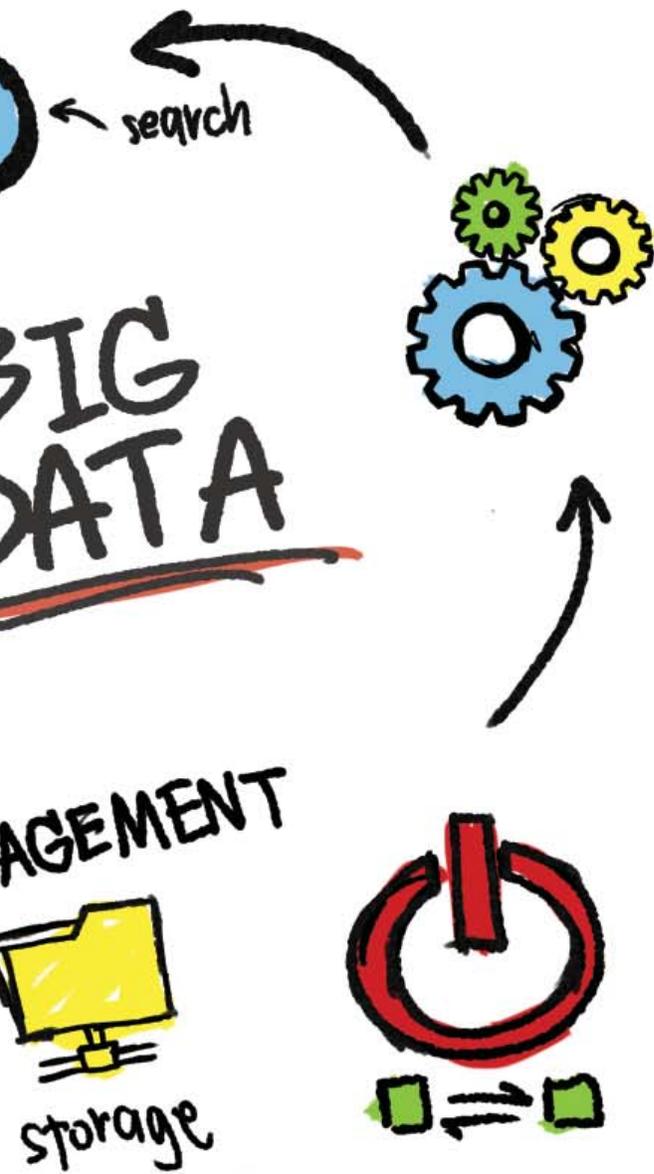
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# Choosing the Right Storage

*EMC's broad and deep product portfolio offers unique design characteristics for addressing diverse workloads.*

The exponential growth of business data is beyond dispute. Meanwhile, the number of options for storing it all seems to be growing almost as fast as the data itself. Rapid advances in technology, the diversity of choices and an excess of market hype make it difficult for organizations to select a storage strategy that inspires complete confidence. There is always the risk that what appears to be the right choice today will seem like a huge mistake tomorrow.

Moreover, the days when storage was simply an issue of managing capacity are long gone. Data storage underlies every aspect of today's information infrastructure — from database and transaction processing to consolidation and virtualization — and will only increase in importance through emerging trends such as hyper-convergence and the software-defined data center.

“There's no simple method for determining the best storage strategy for your organization,” said Jon Chappell, Business Development Manager, Sigma Solutions. “It depends on the components and characteristics of the workloads you are running, the levels of performance you require, the cost structure that best fits your circumstances and a broad range of other variables.

“There isn't a single storage platform that can meet all possible requirements, and industry trends indicate that we're moving toward even more diversification of workloads. This is why we've always felt comfortable asking our enterprise customers to look hard at the EMC storage portfolio. There's really nobody else that can match the breadth and depth of their solutions for storing, protecting and managing information.”

## **A Broad Portfolio**

For more than a decade, EMC has tailored its data storage strategy to serve the needs of organizations with diverse data environments. Product portfolios including XtremIO, VMAX

**“Not all workloads are the same — some require massive performance, some require massive capacity, some require the lowest cost per gigabyte possible. Organizations need solutions with unique design characteristics, built and optimized to support different applications.”**

and Isilon provide solution choices in a broad range of categories.

XtremIO is a scale-out, all-flash storage array designed specifically to accommodate mission-critical applications that demand high throughput and tier-0 and tier-1 reliability, availability and serviceability. Using flash memory instead of spinning magnetic disks to store and retrieve data eliminates mechanical seek and rotation time, delivering read/write response times that are exponentially faster than the best hard-disk drives.

EMC Isilon scale-out NAS storage is known for its practically limitless scale. It can easily handle petabytes of data, and is designed specifically to provide the capacity, throughput and data protection needed to support the big data environment.

Formerly known as Symmetrix, VMAX enterprise SAN has long been the EMC flagship line of heavy-duty block-based storage. It has been gradually updated over the past few years with controller and operating system revisions to add new levels of cloud-like agility, efficiency and control. VMAX now allows administrators to designate whether specific workloads should be run from within the data center or in a public cloud service according to security, performance and other criteria.

Following is a look at three use cases that depend heavily on a robust storage platform, as well as Sigma’s suggestions for the most appropriate EMC product for each.

## **Big Data**

Big data places tremendous pressure on the storage infrastructure as organi-

zations grapple with petabytes or exabytes of information. Big data is ill-suited for SANs, which were designed for high-performance online transaction processing (OLTP) applications rather than unstructured data and file sharing. However, traditional file-based storage lacks the scalability, reliability and performance to handle big data demands.

Scale-out NAS is the ideal platform for big data environments. It provides scalability, performance and resilience in an efficient, easy-to-manage environment that can be built on low-cost commodity storage. A scale-out NAS architecture aggregates commodity storage devices to create a common storage pool with a virtualization/abstraction layer that makes the devices behave like a single system. The system is easily scaled by adding more devices to the cluster rather than increasing the capacity of a particular device.

Scale-out NAS is particularly beneficial in certain industry sectors, such as financial services, that rely upon data-intensive applications. Financial services firms need storage solutions that deliver the performance to support complex financial analyses, the throughput for line-of-business workflows and cost-effective capacity to meet legal and regulatory compliance requirements for data retention. In these environments, scale-out NAS is displacing expensive enterprise scale-up storage equipment with more agile, cost-effective solutions.

**SIGMA SUGGESTS:** EMC Isilon. With its native Hadoop integration, low-cost design and fundamental scale-out architecture, Isilon is the best choice for big-data workloads. Isilon also allows compute and storage to scale inde-

pendently, which can create significant savings for very large analytics data stores.

## **Virtualization**

Virtualization techniques that allow multiple operating systems to run on a single server have had a profound effect on the modern data center. Increased server utilization, scalability and flexibility opened the door for large-scale social, mobile, big data and cloud initiatives. However, these benefits have also brought undeniable disruption to storage infrastructures.

Servers hosting multiple applications are running mixed workloads that create random input/output (I/O) for the storage array. Known as the “I/O blender” effect, this random I/O is difficult for spinning disks to handle, requiring additional seeks and rotations that add precious milliseconds to the read/write process. In a one server/one application arrangement with sequential I/O operations, this rotation is manageable. But in a virtualized environment, tens or hundreds of virtual machines are sending random I/O requests at the same time. In that situation, the disk heads are almost constantly rotating back and forth looking for data, which creates a huge performance bottleneck.

**SIGMA SUGGESTS:** EMC XtremIO. All-flash XtremIO arrays eliminate the mechanical chokepoints of disk drives and actually excel at random I/O performance. Since they don’t have to spin or rotate, XtremIO arrays essentially have direct access to all data locations simultaneously, making them equally fast on random workloads as

on sequential ones and producing huge gains in I/Os per second (IOPS) over disk. A single XtremIO drive can deliver tens of thousands of IOPS — the equivalent of an entire midrange disk array.

VMAX can be an alternative option when customers require higher levels of reliability, scalability and serviceability and more granular quality of service (QoS) controls for establishing specific capacity requirements for different applications.

### High-Performance OLTP

Financial institutions, airlines and retailers are among the many industries that rely heavily upon high-performance OLTP systems to process very large numbers of client transactions. In these systems, databases are frequently queried and updated by hundreds of concurrent users. These workloads tend to be small, interactive transactions that require sub-second response times. Customer satisfaction hinges on these systems, which makes performance, predictability and availability absolutely critical.

**SIGMA SUGGESTS:** VMAX or XtremIO. VMAX is the right choice for environments in which high reliability, availability and serviceability are primary requirements. VMAX delivers the scale, performance and capacity to support mission-critical workloads, demonstrating sustained metrics of more than 3.7 million IOPs with latency of less than half a millisecond. In environments requiring extremely low latency involving mixed workloads, XtremIO is an excellent alternative.

“Not all workloads are the same — some require massive performance, some require massive capacity, some require the lowest cost per gigabyte possible,” said Chappell. “Organizations need solutions with unique design characteristics, built and optimized to support different applications. With its broad portfolio, EMC makes it possible to choose platforms that strike the right balance of features, functionality and cost for diverse workloads.”



# STORAGE. UNLEASHED.

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Contact [Sigma Solutions](#) to learn more about using EMC XtremIO to solve your data storage challenges.

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# 21st-Century Data Protection



*EMC's Data Protection Suite delivers proven backup, archival and compliance functionality in one easy-to-manage platform.*

In the past, if you asked what they meant by “data protection,” most IT administrators would have said “backup.” Today, however, administrators need a suite of solutions in order to overcome today’s data protection challenges.

Virtualization has accelerated the rollout of applications and services, making it difficult to ensure that data is protected throughout the enterprise. Data is often duplicated many times across various systems, increasing the load on already overburdened backup and storage platforms. Much of that

data must be retained almost indefinitely, yet few organizations are able to access that information quickly to meet legal and regulatory requirements.

“Many organizations are finding that their legacy backup and recovery solutions are inadequate due to rampant data growth, stringent recovery requirements and regulatory compliance concerns,” said Paul Isley, Enterprise Solutions Architect, Sigma Solutions. “De-duplication, snapshots, replication and archival have become essential components of any data protection strategy.”

While many point products are available that provide specific functionality, a piecemeal approach to data protection increases costs, risk and management challenges. Organizations need a comprehensive solution that provides end-to-end data protection.

The EMC Data Protection Suite combines best-of-breed backup, archival and compliance software in one platform that’s easy to deploy and manage. It enables organizations to optimize the performance of their data protection environment while reducing costs and increasing agility.

“EMC’s Data Protection Suite simplifies the acquisition of EMC backup and archival products while providing customers with investment protection,” Isley said. “EMC has created a highly flexible, easily consumable model that evolves with changing business demands.”

## **Proven Performance**

Introduced in 2013, the EMC Data Protection Suite delivers a portfolio

of data protection services to support virtual and physical environments and tight integration with EMC's purpose-built backup appliances. It includes EMC's Avamar, NetWorker, Data Domain Boost for Enterprise Application, Data Protection Advisor and SourceOne software.

EMC Avamar uses patented data de-duplication technology that identifies redundant data segments at the source, thereby reducing the amount of network bandwidth used and data stored. It transforms the data-protection process by storing only a single copy of sub-file data across sites and servers, dramatically reducing the amount of data that is backed up.

"This helps customers manage the enormous amount of data both in core data centers and at remote offices," said Isley. "By de-duplicating at the source and across the enterprise, customers can dramatically shrink the amount of time required for backups, network utilization and the growth of secondary storage."

Avamar de-duplication technology is tightly integrated with EMC NetWorker backup and recovery software. This combination helps customers reduce the amount of file system data to back up while easing administrative complexity by providing a common management interface and backup workflow. Because NetWorker also integrates with VMware tools, it is ideal for the virtualized infrastructure.

"NetWorker delivers industry-leading performance while centralizing and automating backup and recovery across the IT infrastructure," Isley said. "The integration of Avamar with NetWorker makes it easy to back up and recover de-duplicated data and allows for scheduling, policy creation, monitoring and reporting through a single management console."

## Advanced Features

Data Domain Boost for Enterprise Applications enables application owners to back up their data using their na-

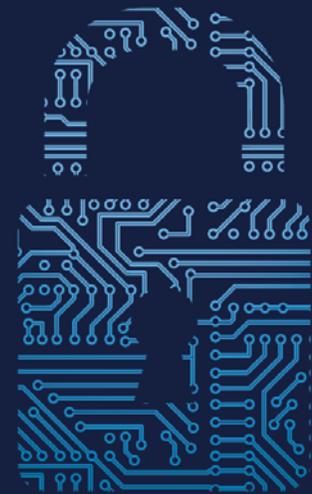
tive application utilities. Seamless integration with Oracle RMAN, Microsoft SQL Server, SAP, SAP HANA, and IBM DB2 gives application owners and database administrators complete control over their own backups, eliminating storage silos for application protection.

EMC SourceOne reduces the burden on storage and backup systems by archiving inactive files, email and SharePoint content. It delivers an integrated approach to information governance using archival as a foundational technology enhanced by retention and disposition capabilities. Customers maintain easy access to archived data along with proactive information-management tools that facilitate high-volume searches.

"These solutions are managed using EMC Data Protection Advisor, powerful software that reduces costs and complexity and eliminates manual processes," Isley said. "It provides visibility into the entire data-protection environment and unifies and automates monitoring, analysis and reporting. Administrators gain greater confidence that data is safe and can be recovered in accordance with service-level requirements."

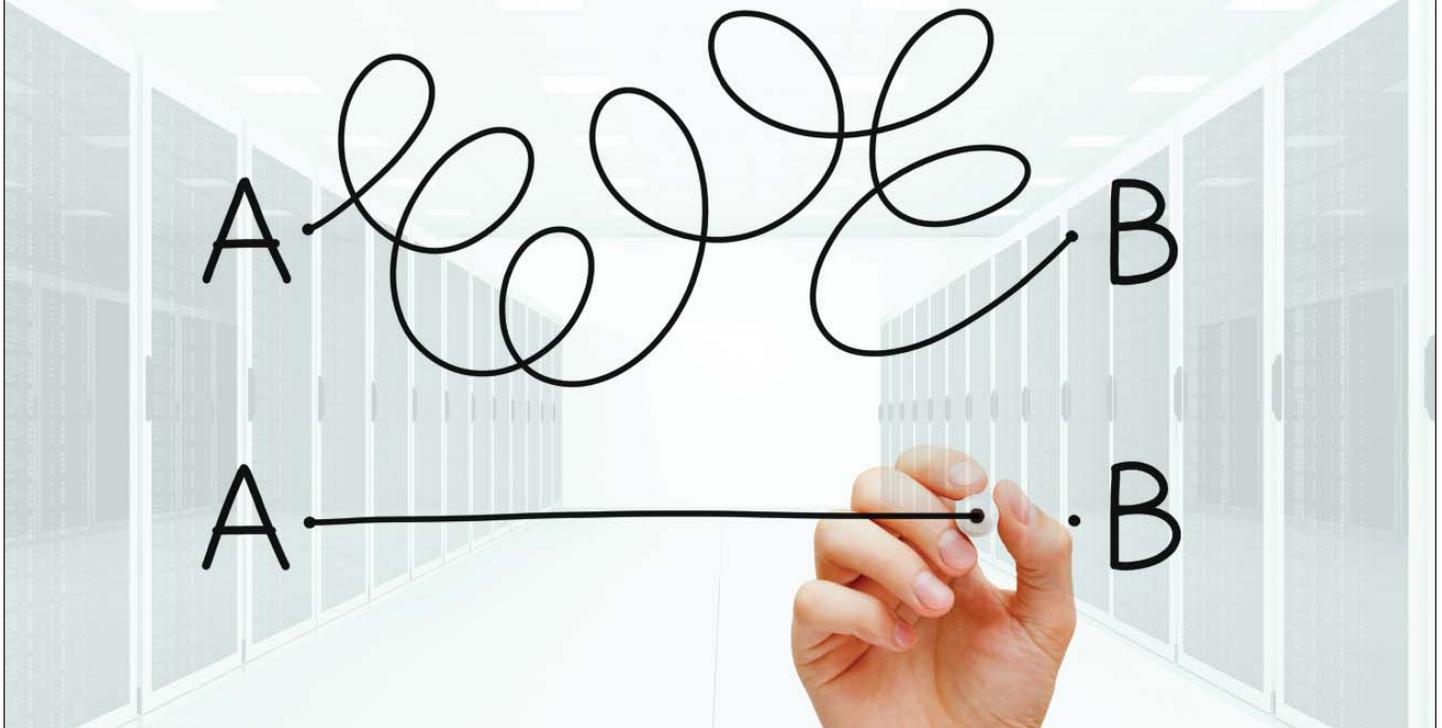
"EMC's flexible licensing plan eliminates the need to size and price individual components yet gives customers access to the full suite of backup, recovery and archival capabilities. Customers can mix and match the use of individual products to best fit their requirements."

Today, multiple data protection systems are necessary to meet data recoverability requirements amid ever-increasing data volumes and regulatory compliance demands. However, implementing disparate solutions creates a fragmented data protection environment that increases costs and complexity. EMC's Data Protection Suite provides industry-leading de-duplication and archival coupled with proven backup and recovery in one high-performance, easy-to-manage solution.



**Data loss and downtime cost enterprises \$1.7 trillion globally in 2014, according to a recent study by EMC. The firm says data loss is up by 400 percent since 2012, and 71 percent of organizations are not fully confident in their ability to recover after a disruption. Also, emerging technology trends are creating new challenges for data protection. Forty-six percent of respondents rated big data, mobile and hybrid cloud as "difficult" to protect.**

# Seeking Simplicity



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*EMC's VSPEX BLUE hyper-converged solution provides a tightly integrated, highly scalable infrastructure stack that helps simplify today's data center.*

**L**eonardo da Vinci said “simplicity is the ultimate sophistication.” The recent growth of hyper-converged infrastructures represents the latest application of this 15th-century philosophy to modern data center practices.

Data centers have customarily been built on a box-by-box basis, with devices added as needed, configured independently and managed manually. Years of continually adding servers, storage devices and networking gear to meet evolving business needs has resulted in IT infrastructures so large and complex as to be nearly unmanageable.

Hyper-converged solutions streamline the typical hardware-centric data center design. They tightly integrate compute, storage, networking, virtualization and management resources and control them via software. The software-based approach simplifies IT and improves agility through increased levels of optimization, programmability and automation.

The new EMC VSPEX BLUE hyper-converged infrastructure appliance combines data center simplicity with seamless linear scalability. Powered by VMware EVO:RAIL and EMC software, VSPEX BLUE

combines common modular building blocks in a flexible, scale-out architecture with automated provisioning and seamless management.

“EMC’s VSPEX BLUE solution is a standout offering that delivers unparalleled automation and ease of management to help customers effectively run their data centers,” said James Smith, Director of Solutions Engineering, Sigma Solutions. “It addresses many of the IT challenges organizations face while providing a high-performance, highly scalable solution designed to support mission-critical workloads.”

## The Next Step in Convergence

Hyper-convergence has evolved from converged infrastructure solutions developed in recent years as simple, flexible and fast remedies for data center bloat. Converged infrastructures consist of pre-racked and cabled compute, storage and networking components integrated into a unified system based upon a validated reference architecture. This approach shortens deployment time, improves management and delivers one-throat-to-choke support.

Converged infrastructure solutions are essentially separate hardware components engineered to work together, which can lead to vendor lock-in issues, however. Additionally, rigid configuration rules limit provisioning and expansion. Most converged infrastructure products deliver a standard form factor with a standard maximum number of disks, CPUs and RAM — with no way to deviate from that configuration.

Hyper convergence resolves these limitations by building on key virtualization concepts. These solutions use hypervisor technology to allow distinct hardware components to be integrated while maintaining a high degree of scalability.

“The EVO: RAIL infrastructure appliance that forms the foundation of VSPEX BLUE features a pretested, pre-integrated VMware software stack,” Smith said. “EVO: RAIL software includes VMware vSphere, Virtual SAN, vCenter Log Insight, and the EVO: RAIL engine — all optimized for commodity hardware from several key partners. EVO: RAIL simplifies appliance deployment and configuration, and streamlines previously manual processes of creating and managing virtual machines, and their associated networks and data stores.”

## Meeting Today’s Demands

The ability to deliver data, applications and services simply and quickly gives hyper-converged solutions an important role in the modern data center. Legacy architectures essentially tie applications to specific servers and associated infrastructure, and require days or even weeks to reconfigure when changes are necessary. That is a ma-

ior drag on operations at a time when IT departments are facing increased demands from an explosion of mobile devices and content, cloud services and virtualization.

“Hyper-convergence speeds deployment and gives customers the ability to manage, patch and upgrade software from one location,” said Smith. “The increased efficiency of creating and managing virtual machines, networks and data stores tends to reduce operational costs and eliminates the need for downtime when performing patches and updates.”

With VSPEX BLUE, customers can go from power on to provisioning virtual machines in under 15 minutes, offering impressive time-to-value when compared to other hyper-converged infrastructure offerings. It provides a fast, low-risk path to new application and technology rollouts by automating provisioning across the deployment lifecycle.

“VSPEX BLUE also offers seamless linear scalability from one to four 2U/4 nodes, making it suitable for a wide range of workloads,” Smith said. “It enables customers to respond to changing business demands without the burden of forecasting resource requirements.”

## Streamlined Approach

The VSPEX BLUE Manager extends the native capabilities of EVO:RAIL, providing a seamless and harmonious user experience that embodies the ease-of-use of the VMware solution. The VSPEX BLUE Manager also simplifies IT management with notifications of patches and software updates, which can be installed automatically without interruption or downtime.

The VSPEX BLUE Market app store is a unique offering that gives customers access to solutions that are pre-validated and ready for download from the VSPEX BLUE Manager. In the first release of the Market, EMC has included access to data protection software from EMC and VMware, providing disk based de-duplicated backup and recovery that is optimized for virtual environments. Customers can also access virtually unlimited hybrid cloud storage via the EMC CloudArray Gateway.

“With the VSPEX BLUE appliance, EMC continues to break new ground, offering for the first time a one-stop Market where customers can download value-added software from EMC and ecosystem partners,” said Smith.

“EMC has raised the bar for hyper-converged infrastructure solutions. VSPEX BLUE enables customers to rapidly deploy virtualized infrastructure, scale capacity and automate provisioning. It delivers the flexibility to streamline operations, reduce costs and enhance service delivery, enabling organizations to better align IT with business needs.”

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