



MSP Technology



Follow Us
on all your favorite
social Media Sites
and stay informed!



Welcome to the ChannelPro *“Getting Ready for The Cloud”* Webinars

Host: Michael Siggins, Publisher of ChannelPro-SMB

Jeff Boles

Senior analyst and director of validation services, Taneja Group Inc.

Greg Schulz

Founder and senior analyst, The Server and Storage I/O Group



About Today's Guest

Greg Schulz

Greg Schulz is an independent IT industry advisor, author, blogger and consultant. Greg has over 30 years of experience across applications, server, storage, networking, hardware, software, cloud, virtualization and services. Mr. Schulz brings the rare perspective of having been an IT customer, vendor and analyst. He has been a member of server, network and storage organizations, including CMG, RAB and SNIA as along with vendor and technology-focused groups.

His blog has been named a top 50 must read for IT professionals in addition to being top ranked on twitter. Greg is author of the books "Cloud and Virtual Data Storage Networking", "The Green and Virtual Data Center" and SNIA endorsed study guide "Resilient Storage Networks". Mr. Schulz is regularly interviewed providing perspectives, commentary and opinion on industry activity in addition to presenting at events on a global basis. Greg has a B.A. in computer science and M.Sc. in software engineering. Learn more at <http://storageio.com>



About Today's Guest

Jeff Boles

Jeff joins Taneja Group from a broad background of hands-on operational IT management and infrastructure engineering, bringing to the group over 20 years of deep experience within the trenches of practicing IT. Jeff's experience crosses the gamut of operational IT encompassing IT governance, operations management, project management, infrastructure architecture, SAN engineering, and process re-engineering in financial, healthcare, professional services, and government sectors.

Following a position as a director of an infrastructure and application consulting practice at CIBER, Jeff most recently worked as an IT Manager with a special focus on storage management at the City of Mesa, near Phoenix, Arizona. Today, Jeff performs analyst work for the Taneja Group and coordinates the Technology Validation Service, designed to objectively evaluate storage solutions in the real world.

Introduction

Storage virtualization is a big part of why private cloud infrastructures are so efficient and scalable. To capitalize fully on the benefits virtual storage delivers, however, cloud service providers must have a working knowledge of several potentially unfamiliar technologies and techniques.

This Webinar will introduce readers to key storage virtualization concepts and explore best practices for configuring and maintaining a virtual storage infrastructure.

Definition and benefits of storage virtualization

Virtual storage solutions enable multiple servers to share a common data repository. That allows companies to manage data centrally and utilize disk space efficiently instead of maintaining dozens of underused hard drives in separate locations.

In addition, storage virtualization improves storage performance by letting multiple disks serve workloads simultaneously...

By equipping private clouds to store data in several places, so that the failure of one or even several disks doesn't produce data loss, virtual storage solutions enhance data protection as well.

In fact, private cloud computing would be all but impossible without consolidated, virtual storage. The ability to spawn new virtual servers rapidly and migrate them to new host devices on the fly are both central to how private clouds keep availability and scalability high. Neither would be possible without centralized storage.

Understanding essential virtual storage concepts

A basic comprehension of fundamental technologies and terminology is critical to implementing successful virtual storage environments. Among the most important concepts to know are these...

Protocols

Most storage virtualization solutions use storage-area network (SAN) technology to store block-level data and network-attached storage (NAS) technology to store files. SANs typically employ one of the following two protocols to connect and manage storage assets:

- **Fibre Channel.** The oldest and still generally fastest SAN protocol, Fibre Channel is also usually the most expensive, since it relies on dedicated cabling and requires specialized technical skills...

Protocols

- **iSCSI.** SANs that use the iSCSI protocol tend to be more cost-effective than Fibre Channel SANs, because iSCSI runs on existing network infrastructure and is based on familiar Small Computer Systems Interface (SCSI) technology.

NAS solutions typically use the Network File System (NFS) protocol, which allows servers and desktops to access files over a LAN or WAN much the way PCs access files on a local hard drive.

Performance

As a rule, virtual storage solutions perform faster than conventional storage architectures. To collect all of the performance benefits storage virtualization makes possible, however, organizations must carefully measure the performance needs of their servers and the performance capabilities of their storage systems.

- The metric used to express those measurements is called “input/output operations per second,” or IOPS.

Hard drive technologies

Broadly speaking, storage virtualization solutions use some combination of two kinds of hard drive: Disk-based and solid state. Solid state drives (SSDs) tend to be faster than disk-based drives but also cost more.

A similar dynamic distinguishes the two interface technologies that most virtual storage systems use to transfer data to and from hard drives

- Serial Attached SCSI (SAS)
- Serial Advanced Technology Attachment (SATA)

SAS drives offer speedier performance than SATA drives but are also more expensive.

Tiered storage

Most well-designed storage virtualization environments utilize a “tiered” architecture, in which frequently-used data resides on fast SSDs or SAS drives and less regularly-accessed records sit on slower but more economical SATA drives. The end result is an optimal blend of performance and cost-effectiveness.

Caches

Well-made storage virtualization systems keep the most heavily-used applications and files in a separate repository called a cache. Typically built with solid-state memory chips or hard drives that execute read and write operations faster than spinning disks, caches can significantly accelerate a storage system's performance.

Redundancy technologies

Many virtualization solutions rely on Redundant Array of Independent Disk (RAID) technology to protect from data loss due to mechanical failures.

Main RAID weakness: All of their hard drives typically reside on the same host server. If that host machine breaks, applications could lose access to critical data. As a result, the latest virtual storage systems employ Redundant Array of Independent Node (RAIN) technology rather than RAID. RAIN systems disperse data not only across multiple disks but across multiple servers as well. That keeps data continuously available even if several servers go down at once.

Data copying technologies

As powerful as they are, redundancy technologies like RAID and RAIN alone can't fully protect data in storage virtualization systems. Backing up data as well is essential. Sophisticated virtual storage implementations use two key technologies to streamline that task...

Data mirroring: Storage virtualization solutions equipped with data mirroring write data in two or more places simultaneously every time users save changes. This creates an up-to-the-minute backup copy and minimizes data loss when primary storage systems fail.

Snapshots: A snapshot captures the complete contents of a storage system at a given point in time. Snapshots enable companies to reset specific files and databases or an entire storage environment to one of several earlier states if data becomes corrupted.

Sizing a virtual storage environment

The first step in deploying a storage virtualization solution should be thoroughly analyzing your client's network infrastructure and then answering the following questions...

- 1. What applications** will your customer be hosting on their private cloud and how much disk space do those applications consume? This will help you calculate the client's storage capacity needs.
- 2. What are the performance requirements** of the customer's applications, in IOPS? This will help you select appropriate disk arrays and design an effective tiering strategy.
- 3. How much downtime** can your client tolerate? This will help you set their "recovery time objective," or RTO.
- 4. How many minutes' or hours'** worth of information can your client afford to lose in the event of a system failure or disaster? This will help you set their "recovery point objective," or RPO.

Collect as much hard, statistical data about your client's current needs as possible, using either their network management software or a remote monitoring and management solution. In addition, gather as much historical data about disk space and performance requirements as is available. Comparing figures from a year ago to their present-day equivalents will help you more accurately gauge how quickly your customer's needs are growing, so you can provision their private cloud appropriately for its first 6 to 12 months of use without overcharging them for resources they're unlikely to require in the near term.

Business continuity and disaster recovery basics

Though redundant by nature, storage virtualization solutions are as vulnerable to catastrophic hardware failure and natural disasters as any other storage environment. Furnishing them with complete and dependable disaster recovery and business continuity capabilities is therefore essential...

Disaster recovery

Disaster recovery technologies help companies meet their RPO targets by backing up data on a regular basis. Service providers should always make certain that the virtual storage environment supporting a private cloud does the following:

- Uses RAIN and RAID to minimize exposure to data loss
- Continuously mirrors data locally in real time as changes occur
- Continuously mirrors data to a secure, remote location as well. This process should employ 256-bit AES encryption techniques to protect data both in transit over the Internet and “at rest” offsite.
- Creates snapshots on a frequent and consistent basis

Business continuity

Simply having a backup copy of data somewhere won't restore companies to operational readiness if the device that data normally resides on has been damaged. Business continuity technologies help clients reach their RTO targets by getting them up and running again quickly after a hardware loss. For example, state-of-the-art private clouds have the ability to create a virtual image of a failed server that your customer can use until replacement hardware has been deployed.

Managing a virtual storage environment

Though a well-designed private cloud makes extensive use of automation to lighten administrative burdens, disciplined management of its virtual storage infrastructure remains important just the same. In particular, be sure to perform these two tasks regularly...

- **Monitor disk space consumption trends**, to ensure you always add capacity well before existing space runs out.
- **Monitor performance for signs of deterioration.** If a virtual storage environment appears to be slowing down, you may need to modify its tiering strategy or make greater use of faster SAS drives and SSDs.

Of course, identifying capacity and performance patterns will be easier if you have an initial set of figures to make comparisons with, so be sure to capture baseline capacity and performance measurements before putting your client's private cloud into production

Conclusion

Many newcomers to private cloud computing have little experience with storage virtualization. Yet knowing how to configure and maintain an efficient virtual storage infrastructure is indispensable to deploying successful private cloud solutions.

Becoming proficient in storage virtualization takes time, but mastering the concepts and techniques described in this white paper is a good way to get started. Over time, and with the benefit of hands-on experience, you're sure to acquire all of the know-how you need to fine-tune performance, minimize wasted disk space, and maximize storage system availability.

A Special Thank You To Our Guests

Jeff Boles

Senior analyst and director of validation services, Taneja Group Inc.

Greg Schulz

Founder and senior analyst, The Server and Storage I/O Group

Visit our Cloud Resource Center
www.ChannelProSMB.com/Cloud

View More Great Content on MSPTV
www.MSPTV.net

For the Zenith Suite of Cloud Solutions
www.ZenithInfotech.com