

# STORAGE

## ESSENTIAL GUIDE TO

# Storage in the Clouds

*Cloud-based services are all the rage, but should you move your online, nearline or backup storage to the cloud? Discover which environments are conducive to cloud-based services, what to look for in a public cloud SLA and how to build a private cloud environment.*

### INSIDE

- 6 Best practices for moving to the cloud
- 9 Is a cloud data backup service right for you?
- 12 Private storage cloud product guide
- 17 Service-level agreements
- 20 Building a cloud storage business



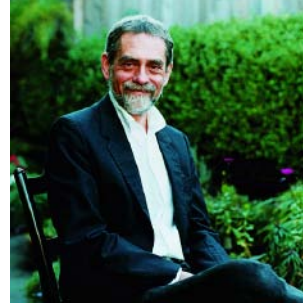
## Having trouble deciding whether to migrate to the cloud?

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# Storing your data in a cloud

*The ideas behind cloud storage—whether external or internal clouds—may not be all that new, but updated technologies make it an intriguing alternative for companies of all sizes.*

**T MAY BE** a concept that's been around awhile, but cloud storage has suddenly—and dramatically—jolted the approach to data storage with a newly burnished alternative to traditional storage methods. First floated more than a decade ago, the technologies that allow storing data in a distant, or even local, cloud are finally reaching maturity, with numerous products and services designed to fit the requirements of companies of all sizes.

But as the name suggests, “cloud storage” can be a bit hazy at times, especially when the notion shifts from online services to in-house storage architectures. Although they represent two very distinct implementations, internal and external clouds are built on essentially the same foundation—a resilient storage platform that offers vast capacities of inexpensive disk that can serve multiple constituencies simultaneously.

For users, the model for external cloud services is astonishingly simple: You can augment or back up your existing storage systems over the wire to an external storage facility while only paying for the storage capacity you actually use. That can translate into significant Capex savings while enhancing data protection. Many cloud storage services have been around for some time, initially offered as consumer or SOHO services but now offered in more muscular versions that are appropriate for larger firms. And some pretty big players—like Amazon, Iron Mountain and Seagate's i365—are actively advancing the state of the art.

Once considered strictly for backup, some cloud storage services come in hybrid implementations that typically include an onsite appliance that links to the remote service provider's storage. Those arrangements can make cloud storage a feasible alternative for even active online data, and a promising option for branch office and remote site storage.

You can augment or back up your existing storage systems over the wire to an external storage facility while only paying for the storage capacity you actually use.

With a new storage paradigm, however, comes a new set of considerations and concerns. Cloud storage service providers are working to allay storage managers' hesitancy about shipping their data offsite where it's no longer under their complete control. Service-level agreements (SLAs) are the key to providing some assurance and peace of mind for cautious storage managers, so negotiating a suitable SLA may be the single most important step in contracting for storage cloud services.

Of course, if sending your data to another company's storage system isn't an option, the internal version of cloud storage may well be. There's been some confusion about internal storage clouds due largely to the use of the term "cloud," which is usually associated with the Internet or some other online facility. But adding to the confusion is that many of the technologies associated with internal cloud architectures have been around for some time, like storage clustering. But the new products in this field do a better job of packaging a complete solution that can make the long-sought idea of utility storage a reality. An internal cloud can be a very appealing way of addressing the massive growth of file storage that most companies are struggling with by providing relatively inexpensive storage on demand. Multitenancy—the ability to efficiently carve up storage resources to serve discrete groups of users—and centralized management are among the key developments that have lifted clustered storage technologies into the cloud.

The biggest obstacle for cloud storage, for both users and purveyors of cloud services and products, is a storage shop that's firmly entrenched in the traditional ways of handling a company's data. In this Essential Guide, we present a series of articles that address many of the concerns and issues related to cloud storage in an even-handed manner, pointing out the technology's benefits and drawbacks. Drop me a line and let me know how you think cloud storage could work for your company. ☺

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# Düsseldorf



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# FIVE BEST PRACTICES FOR moving to the cloud

*Learn best practices for getting the most from cloud storage, including what to look for in a service-level agreement (SLA), using existing resources to set up a cloud and how to avoid hidden pricing.*

*By SearchStorage.com Editors*

**T** **HESE ARE STILL** early days for cloud storage, but we've already gleaned valuable best practices from administrators and other experts for getting the most from a move to the cloud, whether you're looking to do it today or down the road.

## **BEST PRACTICE #1: Scrutinize service-level agreements**

Proceed with caution when it comes to getting a service-level agreement (SLA) from a cloud provider. That means read the SLA closely before committing.

“There are a few major providers offering SLAs that are very vague about things like guaranteed recovery and assured destruction of data,” said Beth Israel Deaconess Medical Center (BIDMC) storage architect Michael Passe at a Storage Decisions session last year. “You want to look behind the wizard’s curtain to see what is really there.”

Lauren Whitehouse, a senior analyst at Milford, Mass.-based Enterprise Strategy Group (ESG), said data access is one area that bears close examination in an SLA.

“Generally, SLAs have to do with access to the service, not to data,” she said. “Generally, the service has to be down more than 10 minutes before it’s considered an outage, so two nine-minute outages in an hour don’t count as an outage. If there’s an outage of the service, they just adjust the bill; that’s the kind of game that gets played. You have to ask, ‘What about access to data?’”

## **BEST PRACTICE #2: Follow your business needs**

Lantmännen, a collective owned by 40,000 Swedish farmers, saved more than \$6 million in the first year after building an internal private cloud with EMC Corp. storage and Riverbed Technology Inc. WAFS devices, said Dennis Jansson, Lantmännen’s chief security officer.

Jansson said users choose what type of application they need through a web interface and each service has a fee, SLA and integrated enterprise security management application.

“We’re able to actually follow business needs,” Jansson said of the cloud. “It doesn’t make decisions on applications the users need.”

He called the cloud “an easier way to say consolidation, virtualization and standardization.”

## **BEST PRACTICE #3: Repurpose your own resources**

Online advertising sales rep firm Gorilla Nation Media LLC built an external customer-facing cloud and an internal cloud for employees by using servers it already owned along with cloud vendor ParaScale Inc.’s Hyper-scale Storage Cloud software to build an object-based clustered NAS system for unstructured data. Alex Godelman, vice president of technology at Gorilla Nation, said the cloud replaced a more expensive NAS setup.

“To grow the internal cloud, we just add more nodes,” he said. “The design of the system is also very simple—we just kind of use it. And it allows us to breathe some life into a huge existing investment, which means we created the system virtually for free.”

## BEST PRACTICE #4: Prepare for the future

Even if you're not ready for the cloud now—or the cloud's not ready for you—start thinking about how it may help you down the road.

Charles Shepard, director of systems architecture at the MGM Mirage in Las Vegas, said he will consider an external private cloud when technology advances make it feasible.

“When Fibre Channel over Ethernet [FCoE] becomes completely adaptable and adopted over the next five years, and when it is completely standardized, that is the pathway to develop a full cloud outside our data center,” he said. “If you have a big enough pipe, like 10 Gigabit Ethernet [10 GbE] or even 100 [Gigabit] Ethernet, you might be able to take a database and write from it to the cloud.”

He said FCoE would be well suited to multitenancy, which is a crucial component of the cloud. “It inherently subsegments networks for internal and external multitenant environments,” he said.

## BEST PRACTICE #5: Beware of hidden costs

Cloud storage providers will tell you the basic cost per gigabyte of cloud storage up front to help you figure out how much it will cost you per month depending on the amount of data you need to store. But these basic costs are only part of the picture, and providers may also charge extra for data transfers, metadata functions, or copying and deleting files. And don't forget the costs of connecting to the cloud, perhaps with a T1 line. ☹



# Is a cloud data backup service

# right for your organization?

*Here's what you need to know about cloud data backup services for your organization. Learn about the pros and cons of cloud data backup technology, and if it's a better alternative than relying on an on-site data backup and recovery strategy.*

*By Lauren Whitehouse*

**ASSESSING YOUR** organization's challenges, abilities and assets will help to determine if deploying a cloud-based data backup strategy is a better alternative than relying on an on-site data backup and recovery strategy. Here's what to consider when trying to decide if cloud backup is right for your organization:

**Budget.** Do you know what your current costs are for data protection? Have you evaluated staff costs to determine if eliminating any on-premises infrastructure, introducing automation or adopting more advanced technology would alleviate issues? A comparison of all capital and operational expenses for on-premises technology over three years vs. operational expenses for cloud-based backup over three years may yield surprises. For example, for a backup tape strategy, the maintenance fees for on-premises hardware, software, media purchases, storage fees and operations overhead over three years could pay for three years of a hybrid cloud service.

**Daily capacity of backup data.** How much data needs protecting (based on the total capacity of data and the daily change rate)? What's the frequency of backups required to meet recovery objectives? Calculate how much backup data needs to be transferred on a daily basis and, given the available bandwidth, whether or not the transfer can be accomplished within the backup window.

**Data protection gaps.** Do you have new directives to improve protection at remote offices/branch offices (ROBOs) or with endpoints? Do you have the staff and capital budget to invest in these new initiatives? Do you currently have a disaster recovery (DR) strategy? If yes, do your people, processes and technology allow you to meet recovery time objectives (RTOs) and recovery point objectives (RPOs)? Leveraging a cloud backup vendor to augment current on-premises data protection processes may be more cost-effective (no upfront capital investment in infrastructure and no additional headcount required) than extending on-premises capabilities.

**Infrastructure.** Is the current infrastructure limiting your ability to meet the needs of the organization? Have budget constraints limited your ability to keep pace with technology advancements? Were you going to do a technology refresh soon anyway? Companies without the capital budget to extend or refresh the IT infrastructure to meet data protection needs—but with a sufficient operational budget—can fund monthly service fees through their operational budget to improve data protection processes.

**Service-level agreements (SLAs) and compliance mandates.** Can you successfully complete your backup within the prescribed window of time? Can you recover data to meet agreed-upon timeframes? If not, is the inability related to outdated technology or lack of sufficient operational staff? Can you meet corporate and/or regulatory requirements with your current people, processes and technology? Does your process for maintaining offsite copies introduce any security risks? If you have recovery service-level agreements that are more aggressive than what can be delivered by streaming data over your WAN link or physically transporting it on portable disk (not unlike tape media from offsite storage), cloud-based backup may not be for you. If you don't have the discipline and capabilities to meet compliance

Leveraging a cloud backup vendor to augment current on-premises data protection processes may be more cost-effective (no upfront capital investment in infrastructure and no additional headcount required) than extending on-premises capabilities.

objectives, then outsourcing data protection to a vendor that can support compliance efforts may pay off.

**Staffing levels and expertise.** Has the economic climate impacted your ability to appropriately staff the data protection function? Do your current backup/recovery infrastructure and processes rely too heavily on operational staff? Do you have in-house expertise to properly architect, build and maintain data protection infrastructure and processes to meet objectives now and in the future? An operations staff is often the most costly aspect of data protection, so adding data protection capabilities without necessitating additional staff could be more feasible. ☉

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Lauren Whitehouse is an analyst at Enterprise Strategy Group and covers data protection technologies. Lauren is a 20-plus-year veteran in the software industry, formerly serving in marketing and software development roles.

# PRIVATE STORAGE CLOUD PRODUCT GUIDE


Building a cloud  
storage business

Service-level  
agreements

Private storage  
cloud product guide

Is a cloud data backup  
service right for you?

Best practices for  
moving to the cloud

A person is looking through a telescope against a clear blue sky. The telescope is held in their hands, and they are looking towards the upper right. The image is used as a background for the article.

*This private storage cloud product guide takes a look at the major hardware and software products in the private cloud storage space. These products are often object-based, support clusters, and have multitenancy and security features to support departments within an organization.*

*By Dave Raffo*

Theoretically, almost any storage system and software can be used to build a private storage cloud. But over the past year or so, vendors have come out with new products or reworked old ones by adding multitenancy and security features that make the products suited to power private storage clouds in the enterprise. This product guide gives a rundown of the major products in the private cloud storage space, some of which are cloud storage software applications that can run on commodity hardware, while others are integrated hardware/software systems.

## Caringo Inc. • CASTor

Caringo was among several vendors to tweak existing platforms to make them more of a cloud play last year. In Caringo's case, it added support for virtual machines and a Cluster in a Box feature that lets customers assign one or more drives to each virtual CASTor node in a physical server chassis using multicore processors for better performance.

Caringo also added a free CloudFolder feature. CloudFolder is a Windows application that lets customers drag and drop files into a folder on the Windows desktop. The files will automatically be added to a CASTor cluster, either at the custom site or at Caringo's own test cluster at its data center. If the data is sent offsite, it's sent without encryption, although Caringo officials said encryption is planned for future releases.

CASTor also supports replication among clusters.

## Cleversafe Inc. • Dispersed Storage Network

Dispersed Storage Network (dsNet) lets service providers build public clouds or organizations set up a private cloud using an information-dispersal algorithm that "slices" data for distribution in different storage nodes. The algorithm contains added code that scrambles the data for encryption and allows the data to be rebuilt even if some nodes go down.

Although its value lies in software, dsNet consists of three hardware components: Accesser, Slicestor and dsNet Manager. The Accesser provides an on-ramp to the cloud by slicing data before sending it over the wire. Slicestor appliances sit on the network and can be geographically dispersed or centrally located. The dsNet Manager is an out-of-band appliance that monitors the dsNet system and rebuilds missing or corrupt data.

Last year, Cleversafe added a Smart Client feature that works as a content delivery network (CDN) and takes into account network performance before retrieving slices over the network. The dsNet file system is accessed through a WebDAV interface, which allows customers to create and allocate partitions, and pool and redistribute storage. dsNet supports object-based storage and iSCSI, with plans to support CIFS and NFS. dsNet with a 1U Slicestor with support for up to 4 TB raw storage, an Accesser and dsNet Manager has a list price of \$9,996.

## DataDirect Networks Inc. • Web Object Scaler (WOS)

DataDirect Networks launched its Web Object Scaler (WOS) system last year as a direct challenger to EMC Atmos. WOS scales into the petabyte range—up to 6 PB in a 100-node system. However, the minimum capacity of two 7.2 TB nodes is smaller than the Atmos starting configuration of 120 TB.

The 3U WOS 1600 is available as a 7.2 TB SAS node optimized for per-

formance or a 16 TB SATA node optimized for capacity. The 4U WOS 6000 can be configured for capacity, performance or both, and can hold up to 60 TB. The WOS nodes make up the cloud, and WOS appliances can be clustered across geographically dispersed sites with a global namespace. WOS also supports file replication and can distribute data across sites for load balancing and redundancy.

DataDirect Networks offers a software agent called a WOS-library (WOS-LIB) that sits on a customer's application servers and translates between user upload/download requests and placement of data on the back-end system. Customers' applications must write to an API in the WOS-LIB to access the WOS cloud.

## EMC Corp. • Atmos

EMC Atmos is software that turns commodity servers and disk into a storage platform, although EMC only sells it bundled with hardware. Atmos cloud storage software runs on x86 1U servers and SATA JBODs. Atmos is available in three hardware configurations:

- The WS2-120 has eight servers and eight enclosures, each holding 15 2 TB SATA disks, for a total of 240 TB.
- The WS2-240 holds 16 servers and 16 disk enclosures, each with 15 2 TB SATA drives in each enclosure, for a total of 480 TB.
- The WS2-360 is more of a capacity configuration, with six servers and 24 enclosures, each with 15 2 TB SATA drives in each enclosure, for 720 TB.

Early this year, EMC introduced GeoProtect, a RAID-like data protection option that splits fragments of data within each data object among geographically dispersed locations. With GeoProtect, data can be restored if fragments are lost.

EMC claims Atmos scales to manage petabytes of data, using a unified namespace to treat multiple systems as one. Atmos uses object-based metadata to allow users to set policies that determine where to store information, which services to apply to it, and how many copies should be stored and in which locations. REST and SOAP Web services are built in, as are capabilities such as replication, versioning, compression, data deduplication and disk spin-down.

Atmos is also the basis for cloud services, such as EMC Atmos onLine and AT&T's Synaptic Storage as a Service.

## Hitachi Data Systems • Content Platform

Hitachi Data Systems last year recast its archiving platform as a cloud storage platform built on its Universal Storage Platform V and VM storage systems. With HCAP, Hitachi Data Systems added support for logical partitions to segregate data and administration for multitenancy, access rights to prevent unauthorized access and encryption. It also

includes a REST interface. Secure multitenancy allows customers to provision services to multiple business units for private clouds (it can also be used by server providers to set up public clouds).

## IBM Corp. • Smart Business Storage Cloud

IBM packaged its Scale-out File Services (SOFS) and storage systems into pre-configured storage cloud bundle options called Smart Business Storage Cloud last October. SOFS is a management “wrapper” around IBM’s General Parallel File System (GPFS), which was designed for high-performance computing (HPC) environments.

Beneath the SOFS scale-out NAS cluster, customers can pick any of IBM’s enterprise data storage systems, including the XIV Storage System and the System Storage DS3000, DS4000, DS5000, DS8000 or DCS9900. They can also choose to integrate Tivoli Storage Manager (TSM), TSM Hierarchical Storage Management (HSM) for tiered storage data migration and LTO-based tape libraries for backup.

Instead of basing its cloud offering on object-based storage with management based on API integration between applications and storage repositories, IBM is using the standard network file protocols NFS, CIFS, HTTP and FTP.

## NetApp/Bycast Inc. • StorageGRID

NetApp acquired Bycast in April 2010, giving NetApp an object storage platform, as well as a building block for private and public cloud storage implementations.

StorageGRID started out being used mainly for medical archiving, but Bycast added support for clustered NAS, security partitions, chargeback and virtual servers last year, and targeted StorageGRID as a cloud storage foundation. Adding discrete security partitions provides multitenancy and lets IT departments support multiple internal customers.

StorageGRID software virtualizes storage across locations into one pool. It runs on most vendors’ storage systems and Bycast sold it through OEM partners such as Hewlett-Packard (HP) Co., IBM Corp. and Iron Mountain Inc., as well as VARs.

Bycast has two pricing options for StorageGRID. Customers can buy a perpetual license based on managed capacity or an annual license for a pay-as-you-go model. Perpetual licenses typically cost approximately \$2,000 per terabyte. Annual license fees per terabyte decrease as system size increases. As an example, Bycast said a license for 500 TB is typically about \$1,500 per terabyte.

## ParaScale Inc. • ParaScale Cloud Storage (PCS)

ParaScale Cloud Storage software turns commodity Linux servers into a parallel NAS farm. ParaScale CEO Sajai Krishnan calls PCS the “first shrink-wrapped cloud solution.” PCS supports virtual servers, multitenancy and user self-service through the SOAP and REST Web services APIs. ParaScale Cloud Storage can also serve as a backup target for virtual machine images, and can boot and run live virtual servers from the cluster while maintaining data consistency for attached applications. By supporting synchronous replication to up to eight targets, PCS can continue replicating as the virtual machine is being written to. Synchronous replication between nodes keeps all data current within the virtual machine.

It’s available as a download from ParaScale’s website and runs on any commodity hardware. Pricing starts at \$.095 per gigabyte.

## Symantec Corp. • FileStore

Symantec repackaged its Veritas Cluster File System into the more cloud-friendly FileStore last October, adding support for file-based replication, as well as CIFS, HTTP and FTP to Cluster File System’s NFS support. FileStore is designed to let organizations add new storage or replace nodes while staying online. Symantec claims FileStore scales to 16 nodes and 2 PB of total storage, and can handle file sizes as large as 256 TB and up to 200 million files per file system.

Symantec uses FileStore for file-based storage in its Symantec Online Backup Service, but also sells it to organizations looking to build private clouds. FileStore pricing starts at \$6,995 for two nodes and two CPU sockets. Symantec sells it without hardware, but partners such as Fujitsu and Xiotech Inc. will bundle it with their hardware. ☉

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Dave Raffo is the Senior News Director at SearchStorage.com.



# CLOUD SLAs SPECIFY UPTIME BUT NOT **availability**

*Cloud storage service-level agreements (SLAs) provide uptime guarantees, but offer few specifics on data availability and data protection; users can try to customize the SLA for cloud backup and archive.*

*By Carol Sliwa*



Today's service-level agreements (SLAs) for cloud storage capacity typically provide guarantees in terms of uptime but specify little in terms of data availability or data protection. Corporate IT shops do, however, have some ability to negotiate additional provisions into their SLAs for cloud backup or cloud archive, according to Terri McClure, a senior analyst at Enterprise Strategy Group in Milford, Mass.

McClure spoke with SearchStorage.com about what end users can expect to find in their cloud storage SLAs. Learn about cloud storage SLAs in this FAQ interview.

**SearchStorage.com: Can you provide a very brief definition of cloud storage, and what is typically covered in a cloud storage service provider's SLA?**

**McClure:** For the purposes of this discussion, I'm referring to storage service providers that offer bulk capacity services online, like Nirvanix, Rackspace and Amazon's S3 [Simple Storage Service]. Most of these storage service providers have very well-defined service levels that can be easily found on their Web

sites. Typical cloud storage SLAs cover what to expect for service levels and what users are entitled to for recourse. So within the details of the SLAs, it's pretty common to see guarantees that the service will be available 99.9% of the time. These SLAs also cover what's defined as service availability—in other words, how long a read request can take to be serviced before it's considered outside of compliance with the SLA, how many retries are allowed and things like that. They also define what sort of recourse users have if the 99.9% uptime guarantee isn't met. And most of them offer some sort of tiered service credit plan where users get, for example, a 10% credit if the service is available only for 99% to 99.9% availability, and then higher credits the lower the actual service levels delivered are.

**SearchStorage.com: What are the major shortcomings that companies need to watch out for in their cloud storage provider's SLAs?**

**McClure:** These agreements sound pretty good as far as service availability goes. After all, 99.9% uptime sounds impressive, but it's nine hours a year of downtime. So once critical business applications are considered, many users have very little tolerance for downtime before suffering a major adverse business impact or loss of revenue. In this light, nine hours can be a lot.

With some storage service providers you can pay a little extra and get geographically dispersed copies of data, and that can help. But the challenge is that remote copy does not protect you just from the most common driver for recovery requests, and that's accidental deletions and software bugs that cause data corruption. Remote mirroring just ensures the bug is replicated and the data is deleted in multiple places. So backup or point-in-time copy is, for the most part, something the subscriber still needs to plan more and staff. This lack of integrated data protection needs to be a core consideration when deciding what can be stored in the public cloud.

**With some storage service providers you can pay a little extra and get geographically dispersed copies of data, and that can help.**

**SearchStorage.com: Do corporate users have much ability to negotiate extra provisions into their cloud storage SLAs?**

**McClure:** The business model for most cloud storage providers is based on providing a generic set of services and selling bulk storage in volume, and key to that is keeping operating expenses and SG&A [selling, general and administrative] costs very low. So, most don't provide that ability. Flexibility in SLAs is offered, though, if users are contracting an external provider to build maybe a private managed cloud at a higher cost than subscribing to the public cloud service, but not really with these generic cloud offerings that we're discussing today.

**SearchStorage.com: What's the main difference between SLAs for cloud storage vs. SLAs for cloud backup or cloud archive?**

**McClure:** This is where the ability to negotiate data protection levels comes in. This is where you can start to customize your SLAs. Users can define retention policies, number of copies that need to be retained, where they need to be stored. Most of the things they define for in-house backup and archive can be negotiated in the SLA when they're buying storage backup or cloud archive services.

**SearchStorage.com: Would you advise a corporate user to enlist an attorney in the process of negotiating an SLA?**

**McClure:** If you're negotiating with a service provider to provide, let's say, private cloud services as a managed service, it's always good to ensure your business is not exposed and that all the T's are crossed and I's are dotted. But, for the public cloud, you might want to have your corporate counsel look at the documents so you know exactly what you're getting into, and you fully understand both you and your service provider's liabilities. But it would be for that purpose only. So yes, I think it's important to have the lawyer look it over so you know what you're in for.

**SearchStorage.com: In closing, what's the primary piece of advice you'd like to leave with end users with respect to cloud storage SLAs?**

**McClure:** It's really important to read the fine print. We've been generalizing here, but really, not all SLAs are the same. I know of one vendor SLA, for example, that offers 99.9% uptime. It sounds pretty good. But they don't count downtime unless the client can't access applications for more than 10 minutes. A nine-minute outage is not considered downtime for them in their SLA. So in that case, in the event of downtime, all the client is entitled to are service credits with that provider. You don't have a lot of recourse there, but you could have a lot of downtime and still be within the SLA.

Some services are more granular, but the overall point is that cloud storage services were really designed as consumer-grade solutions that are being extended to businesses. Cloud services are a fast and inexpensive way to build an IT infrastructure without any capital outlay or in-house infrastructure management capabilities. But you get what you pay for, and the attractive 15-cents-a-month fee is for basic services only. For each extra copy of data or improved bandwidth for backup, it can push the price up very quickly. So I expect some solutions, like local gateway types of solutions, to start coming into the market this year to help with some of these issues. But until then, users need to fully understand what they're getting into when moving data into the cloud. ☉

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Carol Sliwa is the features writer for SearchStorage.com.



*Hosting your own cloud storage services brings greater rewards—and greater risks—than reselling another provider's services. Learn how to put together a cloud storage services business.*

*By Sue Troy*

**OTS OF HOSTING** companies offer public cloud storage services. And, sure, you could resell those services to your customers. But what if you want to host services yourself? The risk is greater if you host them, but so is the reward.

Despite the higher chances for a big return on investment (ROI), the cost and profit potential of hosting cloud storage services depends on a number of factors. Opinions also vary on the ROI of cloud storage services, but the analysts, vendors and managed service providers (MSPs) we spoke with agree that storage solution providers are well-positioned to extend their business into cloud storage services.

“They already have a lot of the infrastructure; they’ve already got the

network stuff,” said Daniel Golding, vice president and research director at Tier1 Research. “I have not yet run into anyone who has said, ‘I can’t figure out how to make money at this.’ That’s not a typical objection.”

So how do you build out a cloud storage services business? There are different routes to take, but some basic steps apply across the board.

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## Step 1: Think big

One key to success is to forget about offering cloud storage services on a small scale. To make money, analysts said, you need to think big. “You’ve got to do this at scale,” Golding said. “Doing this as a one-cabinet business, you will lose money. Period.”

BC Networks, an MSP in San Jose, Calif., is in the launch phase of its Virtual Vault service, which the company expects to scale using software from ParaScale Inc. Paul Harrington, lead architect of network architecture and planning at BC Networks, said the business plan calls for storage of 500 TB to 600 TB of customer data two years from now. Harrington points to scalability as a fundamental underpinning of cloud storage.

“There is a federated economic that says that if this becomes really big, the economics of doing it at a much larger scale are much better. They’re almost ‘avalanche’ better,” he said.

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## Step 2: Determine what hardware you’ll use

The analysts and vendors we talked to said that another key step is to determine what hardware you’ll use for your cloud storage infrastructure—and, in general, you should focus on commodity hardware.

“[MSPs] have a lot of old storage [devices] sitting around. What do you do with them?” Tier1 Research’s Golding asked. “Well, [cloud storage is] a really cool thing to do that monetizes them. If I had to buy new servers [to host cloud storage services], it might be a close bet.”

Henry Baltazar, storage analyst at The 451 Group, agreed that the cloud storage services business model makes the most sense using commodity hardware. The first question to ask, he said, is “How am I going to build a cloud? You need to figure out how to make a scalable back-end storage infrastructure out of commodity hardware. Sure, you can build it on enterprise-class storage systems from NetApp or EMC, but [that could be a costly proposition over the long haul].” Baltazar pointed to companies such as ParaScale and Cleversafe Inc. for software at the bottom layer of the cloud storage infrastructure.

ParaScale CEO Sajai Krishnan said the revenue model for his firm’s cloud storage software platform is much better using commodity hardware. “A service provider or an MSP can purchase our software and put it on top of existing Linux boxes—off-contract servers, repurposed existing

servers, run our software and make it appear as a single cloud storage appliance,” he said.

With such a commodity-based approach, Krishnan said, MSPs and VARs can realize margins as high as 70%, charging as much as 40 cents to 50 cents per gigabyte per month.

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### Step 3: Ensure data protection

The next step in the process of building out a cloud service infrastructure is data protection. “[The cloud storage infrastructure needs to have] the ability to replicate data to multiple sites to ensure that data is still accessible even in the event of a site outage,” The 451 Group’s Baltazar said. For many MSPs, this piece of the puzzle is built into their business model. They already replicate data to a co-location facility for business continuity and disaster recovery purposes. If you’re not replicating off-site, you’ll need to include that in your plans.

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### Step 4: Determine how to handle data access

Once you’ve built out the storage infrastructure with commodity hardware and have processes in place to protect the data, you need to provide a way for customers to access their data at your data center. Companies such as Mezeo Software and Bycast Inc. (now owned by NetApp) have software in this space. “They provide a front end that allows you to access that back-end storage,” Baltazar said. “It’s making conventional storage talk like a cloud system.”

While companies like ParaScale and Cleversafe handle the storage infrastructure end of things, and Mezeo and NetApp’s Bycast handle data access, some companies take on both ends. Examples of this approach include EMC Corp. with Atmos and DataDirect Networks Inc. with Web Object Scaler (WOS).

“These appliances essentially give customers a complete cloud storage infrastructure by providing both the protocol access layer in addition to the scalable back-end storage resources,” Baltazar said. “They’re doing both aspects: the protocol part and the scalable back-end part.”

Baltazar noted that the basic architecture for cloud storage services isn’t static. “Cleversafe added an API, so they’re moving more toward DataDirect and EMC Atmos,” he said.

Terri McClure, a senior analyst at Milford, Mass.-based Enterprise Strategy Group (ESG), said the product classifications aren’t cut-and-dried. For instance, she sees NetApp’s Bycast as a competitor to EMC Atmos and DataDirect Networks more than playing only as the data access layer of a cloud storage platform.

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## Step 5: Consider marketing

The last basic step to offering cloud storage services relates to marketing: You'll need to determine your go-to-market strategy. BC Networks' Harrington has some advice: Stay away from the "cloud" moniker.

"The enterprise has not entirely bought into the cloud. When we go to our customers, they ask us, 'Can you back up our stuff?' They're not even thinking about cloud. And so Virtual Vault is presented as not a cloud offering at all [but] as a backup solution or a DR [disaster recovery] solution," he said.

Harrington said that when customers want information about the Virtual Vault infrastructure, the discussion turns to BC Networks' data center, which is housed in Savvis facilities. "In our marketing material, we're showing that we're multisited and that we have a scalable storage platform that's resilient [and] redundant," he said. "We don't really talk about the cloud at all. But the fact is that we are using cloud technology to get it out."

While the approach BC Networks takes with its Virtual Vault service might work with smaller customers, enterprises—often more averse to the MSP model than small companies to begin with—appear to still be staunchly anti-public-cloud.

"At larger companies, no way would they trust their data to the cloud," ESG's McClure said. "We do see enterprises running out of floor space, sprawl, power, cooling. They're starting to recognize things need to be done a little differently, and I think that's what's generating the interest in the cloud. It's a services-based model with perfect, 100% utilization rates. But they're reluctant to trust their data into the cloud. It's still pretty unproven." ☉

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Sue Troy is the site editor for [SearchStorageChannel.com](http://SearchStorageChannel.com).

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