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BACKUP & RECOVERY TO THE CLOUD

1105 MEDIA

"You should never, ever back up your servers." Said nobody, ever.

Yet, despite the common wisdom of a server backup, many businesses view it as a low priority, too much of a hassle, or too expensive to bother with. Worse, they may feel that with limited storage they must pick-and-choose which data to save and protect. It's like asking someone which leg they want to keep, or which half of their house they want burned to the ground. That's not a choice at all.

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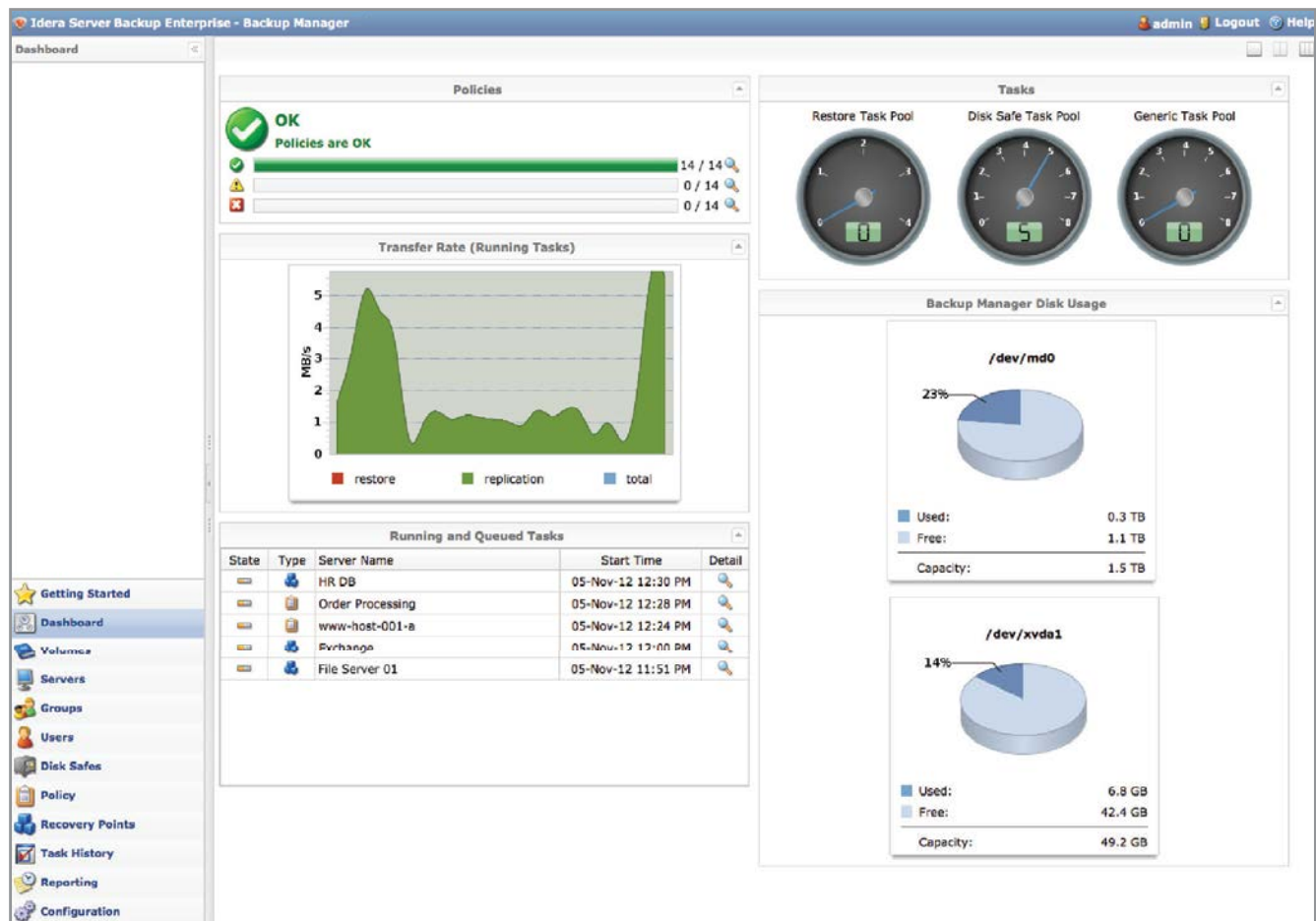
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Targeting Your Backups
to the **Public Cloud**

Lower costs and expanded offerings are making Infrastructure as a Service an attractive data-protection target.

BY JEFFREY SCHWARTZ

Until last year, the law firm of Segal McCambridge Singer & Mahoney Ltd. used tape to back up its data. Now the firm has replaced tape with a new backup target: the public cloud.

Segal McCambridge represents a growing number of organizations exclusively using public cloud services instead of tape or other media to back up their data. As a result, the law firm's IT staff can quickly find and recover data whether a file is inadvertently deleted, a local system goes down or disaster strikes.

Just how popular is the public cloud becoming as a backup target for enterprise data? Opinions vary. A survey of 3,236 global IT executives last fall by Symantec Corp. found 93 percent are at least discussing the use of cloud services. Of those, backup and recovery

was the second most likely use of those services, bested only by e-mail management and coming in ahead of security, which ranked No. 3.

Enterprise spending on public cloud infrastructure services grew 43 percent last year to total $6.1 billion, according to IT market researcher Gartner, which forecasts that spending will grow 48 percent this year, exceeding $9 billion in IT funds shelled out. The amount of data that organizations are storing in the public cloud is also expanding at the same pace. Amazon Web Services Inc. (AWS), the most widely used provider of cloud Infrastructure as a Service (IaaS), in late November reported 1.3 trillion objects stored on its Simple Storage Service (S3) compared with 762 billion around the same time in 2011.

Many Moving Cautiously

Despite such growth, most companies are still reluctant to back up large amounts of their data to the public cloud. For example, Acronis International GmbH, a supplier of backup and recovery software for small, medium and large enterprises, started offering its customers the option to back up their data to an IaaS it built out two years ago with more than 12 datacenters worldwide.

So far, only 15 percent of its capacity is being used for backup and recovery, according to Steve Erdman, Acronis senior VP and general manager for global business development. "It's still a low percentage of capacity," Erdman says. "We work with our customers to get them over the natural hesitation, but it's not an exploding market yet."

Steve Fairbanks, data management VP at CA Technologies–which has added support for AWS and Microsoft Windows Azure to its popular ARCserve software–agrees. "We're seeing an uptick, but it has been slower than we had expected," Fairbanks says.

For its part, Segal McCambridge got over its reluctance after testing a cloud-based storage and backup and recovery offering from Nasuni Corp. to back up the firm's Autonomy iManage document management system to the AWS EC2 and S3 storage services. Easing the firm's comfort level was the fact that Nasuni distributes data to multiple sites and encrypts data at rest and in transit using OpenPGP and AES-256 encryption.

Over a period of two years, the firm gradually replaced all of its tape backup processes with the Nasuni offering and another cloud

Most companies are still reluctant to back up large amounts of their data to the public cloud.

backup service offered by nScaled Inc. Segal McCambridge completed the transition in September.

"I'm happy to say we've actually closed our physical disaster recovery location and we're now 100 percent cloud backup," says Matthew Donehoo, director of information systems for the 400-employee law firm, which is headquartered in Chicago, with remote offices in Austin, Texas; Baltimore; Detroit; New York; Jersey City, New Jersey; and Philadelphia.

Midsize organizations like Segal McCambridge are prime candidates to move away from tape or disk—or, in some cases, dedicated backup and disaster recovery facilities—to public cloud services. Cloud providers offer elastic services, meaning they can add or subtract storage capacity on-demand while lowering the cost of administration.

Nasuni, a popular and well-funded venture-backed startup, offers what it describes as Storage as a Service, where it sells enterprise customers appliances that consist of a filer and storage controller. The appliance uses standard protocols, including Common Internet File System (CIFS), Network File System (NFS), iSCSI and HTTPS, and provides NAS and SAN workloads that will replicate and synchronize files, databases and VM storage to a public cloud storage provider (CSP). Nasuni's currently preferred CSP is Amazon, though Nasuni CEO Andres Rodriguez compares cloud providers like Amazon and Microsoft to disk drive makers.

"We look at cloud services providers the same way a storage systems company looks at a Seagate or Western Digital," Rodriguez explains. "It's a critical component, but there are choices. We provide guaranteed service—the only thing a customer has to consider is whether they need more capacity."

Nasuni gained notoriety in late 2011 when it posted its own benchmark that rated the performance of 16 leading IaaS players. That study found Amazon to be the most reliable (with Microsoft Windows Azure coming in second), following a 26-month stress test that measured scalability, availability, stability and performance. Among others that fared well at the time were AT&T, Nirvanix Inc., Peer 1 Network Enterprises and Rackspace US Inc. While 10 others, which Nasuni declined to identify, failed, IaaS providers have aggressively built out their infrastructures over the past year.

Many analysts agree AWS and Microsoft, respectively, are the largest providers of cloud-based compute and storage capacity, while Rackspace is also a key player (see "Back Up Your Systems to

Midsize organizations are prime candidates to move away from tape or disk to public cloud services.

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the Public Cloud," p. 8). But there are a dozen or more other major providers and thousands of smaller players that offer cloud backup and recovery services.

Availability Concerns

Yet despite (or because of) their rapid growth, both Amazon and Microsoft, among others, have experienced widely publicized outages that brought down a number of high-profile businesses last year. The businesses affected included Instagram, Salesforce.com Inc. Heroku, Reddit Inc., Quora Inc., the popular personal file storage service Dropbox Inc. and Netflix Inc., which was down at the most inopportune time—Christmas Eve. While Nasuni uses Amazon to back up customer data, Donehoo says he remains confident the law firm's data will remain available.

"That raised eyebrows, but functionally those outages didn't impact us," he says. "I'm still confident in Nasuni's uptime and in my opinion it will be the same if not better than local. You're going to have issues regardless; it's a question of how much you want to spend on all aspects of your network."

Indeed, many argue a company's network can be the most significant bottleneck in using public cloud providers for backup and recovery, especially for those with multiple terabytes (or more) of data.

"We don't see many people using the cloud for primary backup," says Mark Campbell, CTO of Unitrends Inc., a longtime provider of backup and recovery software and appliances to small and midsize businesses (SMBs) and enterprises. "The reason is, to move a terabyte of data over a fully provisioned T1 line, depending on the level of compression, takes 30 to 60 days. Most of our customers can't wait even a few days." Campbell notes most of Unitrends' customers are using the cloud for replication and archiving rather than file-based backup. When a customer wants to replicate or archive large volumes of data, they ship NAS drives overnight via FedEx or UPS.

Others say there are ways around the network issue. Many use various forms of optimization such as data de-duplication, which only transmits bits of data that have changed (although that doesn't address the initial backup). Another popular solution is WAN optimization. Leading suppliers frequently mentioned are Riverbed Technology Inc. and TwinStrata Inc., though others that offer WAN accelerators include F5 Networks Inc., Cisco Systems Inc. and

"We don't see many people using the cloud for primary backup."

Mark Campbell,
CTO of Unitrends Inc.

Citrix Systems Inc., which offers the Citrix Branch Repeater for its NetScaler SDX application-acceleration platform.

Riverbed and TwinStrata both offer so-called "file systems to the cloud," notes Rick Vanover, product strategy specialist at Veeam Software, which provides products that back up VM images as well as physical machines. Veeam, which has co-marketing relationships with Riverbed and TwinStrata, last month launched its Cloud Storage Gateway, which uses its own file compression and then connects to a WAN accelerator.

Vanover says, while he's seeing growing interest in backing up data to a public IaaS, "it's another option customers see to build off the different layers of their data-protection strategies."

The rapidly declining cost of using IaaS providers is also making them a more attractive backup target. Already this year, AWS and Microsoft have cut the cost of their core services. And last year AWS launched Glacier, an archiving service that costs a penny per gigabyte (though data stored there can take many hours to retrieve versus near-instant availability with its flagship S3 storage offering).

Look for the breadth of backup and recovery options to grow this year.

More to Come

Look for the breadth of backup and recovery options to grow this year. For example, Rackspace in the coming months intends to offer an agent for its Cloud Backup service that allows IT pros to configure where their backups can go. That will include allowing replication from the Rackspace shared Cloud Files service to the company's dedicated hosting offering as well as other cloud providers, initially Amazon EC2 (though not S3), says Rackspace product director Scott Gibson. "If we allow the backup to go to multiple datacenters, we're solving the problem of the need for redundancy," Gibson says.

Quite a number of players that offer backup and recovery solutions agree they're seeing the greatest amount of interest in cloud services from small and midsize organizations, which naturally have less-complex requirements—particularly those not burdened by regulations regarding data sovereignty or other compliance requirements.

"We're seeing a lot of midsize customers wanting to go completely to the cloud for backup purposes," says Danny Milrad, director of product marketing for the Symantec NetBackup offering, which now is available with network accelerators to key public cloud providers including AT&T, AWS, Nirvanix and Rackspace.

Symantec last year also released a Software as a Service (SaaS)

Symantec plans to up the ante with an offering internally known as Symantec Disaster Recovery as a Service for Windows Azure.

edition of its popular Backup Exec for Windows. Called Backup Exec.cloud, it provides automated backup and recovery of PCs, servers and VMs, and backs up data to its own datacenter.

Later this year, Symantec plans to up the ante with an offering internally known as Symantec Disaster Recovery as a Service (DRaaS) for Windows Azure. The service will be based upon Veritas Storage Foundation High Availability from Symantec for Windows and Veritas Replicator disaster recovery software linked to Windows Azure.

While CA ARCserve and CommVault Simpana 9 Express backup and archiving software allows customers to use Windows Azure as a backup target, Symantec execs argue that their company's upcoming offering will use replication and will offer better recovery time and recovery point objectives.   **R**

Jeffrey Schwartz is editor of Redmond.

Back Up Your Systems
to the **Public Cloud**

How to protect and recover enterprise data using Amazon S3, Microsoft Windows Azure and Rackspace Cloud Block Storage services.

BY DEREK SCHAULAND

Public cloud services are increasingly becoming feasible targets for backup and recovery of enterprise data. The biggest reason to consider a cloud services provider is for the disbursement of resources.

Large cloud providers have geographically distributed and redundant datacenters spread throughout the world. The global availability and failover provided to customers by these providers, combined with the affordability of such services, are creating a shift in which moving backup to the cloud is becoming an economically feasible alternative to backing up to tape.

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Figure 1. *The Microsoft Windows Azure features that are included in the free 90-day trial.*

Cloud backup solves the off-site storage issue many times over.

Cloud backup solves the off-site storage issue many times over. Not only does it move the data off-site, thereby providing disaster recovery, but using cloud services for backup and recovery also fails-over around the world in almost every case (depending upon the provider's geographic reach).

The most widely used public cloud services provider is Amazon Web Services Inc., while Microsoft and Rackspace US Inc. offer cloud compute and storage services as well. There are many other major providers, including AT&T, Hewlett-Packard Co., IBM Corp., Verizon and virtually thousands of others; some are regional, while others are global.

Given the wide usage by enterprises of cloud services from Amazon, Microsoft and Rackspace, in particular, I decided to test drive and evaluate how suitable they are for backup and recovery.

Microsoft Windows Azure

Many of the Microsoft offerings you now run in your on-premises datacenters are becoming available as part of the Windows Azure portfolio of services, which includes SQL Server, SharePoint and Active Directory (in the pipeline). In addition to these offerings,

Working with the Windows Azure trial, I quickly found browser-based access is best for managing the service.

Microsoft also lets customers store data on the Windows Azure service. In many ways it's like SkyDrive for enterprises. While SharePoint 2013 and the business editions of Office 2013 offer SkyDrive Pro, it's different from the storage services offered via Windows Azure.

I reference SkyDrive to point out that Windows Azure is many things above and beyond storage, and these things are growing all the time.

To get started, Microsoft allows a 90-day free trial with a credit card. The sign-up process takes a couple of minutes, but it's quite simple. When you first set up the trial, your Microsoft account is checked to make sure it's eligible for the trial. Then you see the screen explaining what you get as part of the Windows Azure service (see **Figure 1**).

The storage portion of the Windows Azure trial allows for 35GB of data storage during the 90-day period. Because most backup data is large even when compressed, I worked with a small subset of data for this evaluation and found the service fairly easy to work with. The provisioning of features within the portal is wizard-driven and will prompt you for needed information, such as the name or URL to use for your storage account. Once you provide a unique name for the base of the URL, the Windows Azure service gets to work and creates the space.

Though the data-entry process for me was fairly painless, I expected it to take a while to provision the storage. It works just like an on-premises storage configuration in that regard: start the provisioning process, get lunch, work on something else for a while, and come back to find the storage ready to go. In this case, the trial provisioning took about four minutes, but naturally the more you store, the longer it will take.

When using Windows Azure storage, access to the service is authenticated using a pair of 512-bit keys to ensure that your data is accessing the proper storage account.

Working with the Windows Azure trial, I quickly found browser-based access is best for managing the service (though not for managing the data). For this I used a third-party tool, CloudBerry Explorer for Windows Azure (it's a free download, which you can obtain from **bit.ly/ThCa1v**). Once installed, logging into my Windows Azure account with the shared key and account name got me into the service in no time at all.
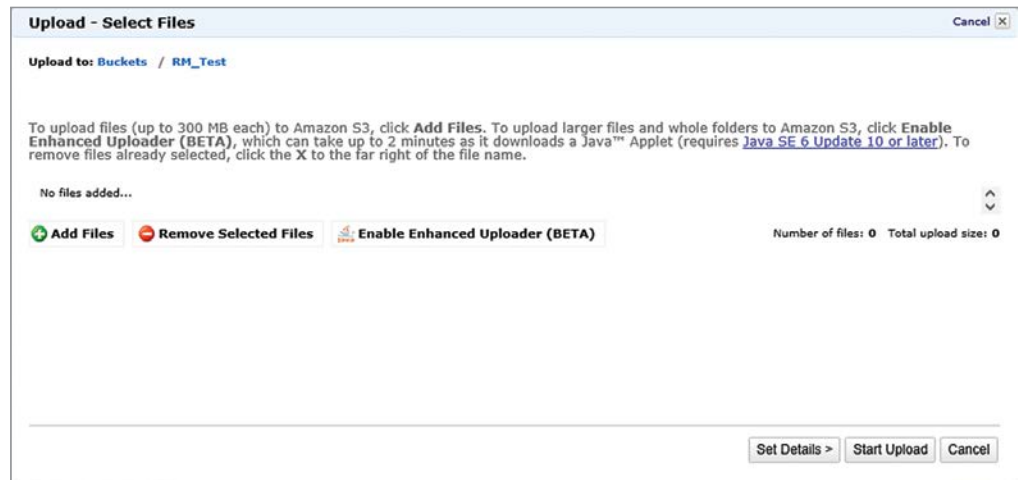
Figure 2. *Upload files to Amazon S3 through a simple interface.*

Microsoft offers geo-replication of your information, which enables data replication between two sub-regions. In my case this was "uswest" and "useast," providing multiple locations for my information.

As part of the management portal provided with Windows Azure, you can also monitor the service. This will provide information about your storage accounts and containers, including information about geo-replication if enabled.

Storing Data

Getting files and information into and out of the Windows Azure service is not immediately clear in the browser. There should be a client available from the portal for accessing the service, which I wasn't able to locate. However, the free CloudBerry tool let me write data to the configured space immediately, so this was not a huge problem.

Outside of the need to find a client to access the storage, the service worked very well and was easy to move around in and use. Windows Azure also supports Windows PowerShell cmdlets for managing the service.

Backup Options

Microsoft now offers a significant amount of its product stack in the cloud. That includes its Database as a Service (SQL Database, formerly known as SQL Azure Database) and Windows Azure Active Directory (in beta at press time), as well as VM roles running OSes from Windows Server 2012 and Linux. These services can integrate with your on-premises apps as well.

> **The quality and quantity of services being added to Windows Azure is growing all the time.**

One of the newest solutions Microsoft has made available for preview is an online backup service that works via an agent deployed in your environment. Using the agent, the backups are written back to the service as they're collected. Storing the snapshots directly in the cloud with Windows Azure removes the need for archiving backup data to the cloud.

In addition to storage containers, Rackspace provides other services including load balancing, DNS servers, VMs and a dedicated backup solution.

I really like the portal that controls the Windows Azure service. Normally this isn't something I'd call out because the configuration screens are generally tolerable, but Microsoft kept things all in one contained space and made navigation and discovery of the tools and portal for all the Windows Azure services easy. Help was also easy to locate.

Once I began placing files into the service, it operated as expected and it was easy to move data into and out of the containers. The easy expansion into other areas of the Microsoft product stack is also something that would be worth considering. Maybe today your organization wants to place a few gigabytes of backup data or limited-use files in the cloud to conserve on-site disks and enable off-site storage, but in the future you might need to look at expanding Active Directory or SQL Server. Windows Azure supports both of these services, and both the quality and quantity of services being added to Windows Azure is growing all the time.

Pricing information beyond the 90-day trial can be found at **bit.ly/uRVnjf**. Because the service is priced on-demand and charges only for space and resources used, the cost could vary depending on how your organization uses the service. Keep this in mind and consult the calculator to get an understanding of the costs of the Windows Azure service up front.

Amazon S3

Amazon Simple Storage Service (S3) allows any type of storage at a per-gigabyte cost to its customers. Because the service allows you to store any kind of data using a Web browser client or a third-party application, it can be extremely useful for both general data storage and for creating

Figure 3. *The Rackspace Cloud Block Storage login interface provides basic configuration choices.*

backups. When paired with the Amazon pricing model, customer organizations are charged only for the specific amount of data stored and for the cost of data transfer into the service.

I've used Amazon S3 on a few occasions in the past to speed up the download of larger files for coworkers in remote locations, more for the improved bandwidth than just the storage, but the experience has been a good one.

Amazon S3 stores your data in buckets, which behave like folders within your storage space. The buckets are similar to the containers used by Windows Azure, but were explained a bit better when getting started. The use of separate buckets also allows different security settings to be added. Suppose you created a bucket to contain downloadable customer literature. You could configure the security on the bucket to make it visible to everyone. This way, linking to it from the customer's area of a Web site or in an e-mail would be a simple way to offload the storage of downloadable content.

Creating a separate bucket for your backup files with visibility and access limited to your IT organization allows the files to be offloaded or even archived in the cloud while preventing others from accessing the content.

The S3 service includes a browser-based client for managing buckets as well as file transfer (see **Figure 2**). Be aware, however, that it's not as user-friendly as any of the third-party clients I've tried. Because the security- and bucket-management features are built-in to these clients, they streamline access considerably while using a key pair to ensure data is secured.

Also, like the Windows Azure service, S3 has other counterparts in Amazon cloud services offerings such as its new data archiving service called Glacier. These services allow many similar possibilities for additional compute and database needs.

Amazon S3 is also priced per used-storage quantity at the gigabyte level. More information on the cost of the service can be found at **amzn.to/4Dgfzc**.

Rackspace Cloud Block Storage

The offering from Rackspace is based on OpenStack, the open source cloud infrastructure project it launched in collaboration with NASA (and which is now being spun off into an independent foundation). With about 200 supporters—including Cisco Systems Inc., Dell Inc., HP and IBM—OpenStack-based clouds are designed to

> **Amazon S3 stores your data in buckets, which behave like folders within your storage space.**

ensure portability among public providers as well as private clouds that use the OpenStack software.

I received a 90-day trial of Rackspace Cloud Block Storage—which, like Windows Azure and Amazon S3, includes block storage and VM compute power. The Rackspace cloud service interface was very intuitive to get started with. It was mostly straightforward and available right after logging in.

Some of the configuration wizards and other in-browser windows never seemed to be on a screen big enough to see all of the options. That's something to consider, because ease of configuration is part of why these cloud services have become so popular.

When creating a storage container, the available datacenters to hold the containers for an account are based on the region the account is created in. When I created storage containers, I was able to place them in Dallas or Chicago. Then, naming the container and clicking "Create Volume" was all that I needed to do to get started (see **Figure 3**). It's very simple to get off the ground, which is helpful if you need to get things moving quickly.

Once the containers were created, I was able to upload files directly using a browser-based client (there was also the option to download a third-party client for multithreaded upload).

In addition to storage containers, Rackspace provides other services including load balancing, DNS servers, VMs and a dedicated backup solution. The Rackspace backup solution uses an agent—much like the Windows Online Backup solution—to capture your information directly to cloud-based storage.

Rackspace has two pricing options. One is for spinning disks and one is for solid-state drives (SSDs), and all of the I/O for the service is included. More information can be found at **bit.ly/YlTgKQ**.

Overall Impressions

Amazon seemed easier to use than Windows Azure when I tried to do it through a browser. Because of the nature of operations such as backup, it might be best to consider a third-party client to allow for scheduling, multithreaded file copy and overall ease of use.

With that being the only exception, the services fared about the same in my testing and usage. Because I only used the trial services offered for free and used a limited data size of the same set of files (approximately 25GB of data), the operations were acceptable. If you're working with larger datasets your mileage will vary, and much

Ease of configuration is part of why these cloud services have become so popular.

of the statistics will depend on the speed of the Internet connection being used.

Windows Azure, Amazon S3 and Rackspace Cloud Block Storage are all extremely capable services for parking files, whether primary or backup. The fact that Rackspace included I/O with the cost of the service was definitely a plus. However, the other services were not terribly expensive, especially if the files being placed in the cloud aren't intended to be primary storage. Because the cloud services are sitting on large Internet connections all over the globe, the bandwidth on the remote end should not be an issue.

Consider Data Types

Because of network latency and varying speeds of Internet connection, there will be some delay when moving files into and out of the cloud.

Pay attention to the types of data your organization is backing up to the cloud. Because of network latency and varying speeds of Internet connection, there will be some delay when moving files into and out of the cloud. Because of these issues, and the possible need to recover certain information more regularly (misplaced files, for example), using cloud storage for an archival solution that may not be needed as readily might be the best use case.

However, Internet connections are becoming more reliable and faster. Many organizations are considering redundancy between multiple connections, so using the cloud as a primary storage location might be a viable alternative for some organizations today. For those wanting added redundancy, you may want to use multiple cloud providers as well.

This evaluation covered only the core storage services from each provider, and did not take into account services such as Amazon Glacier.

In addition, all of the providers are working to provide multiple technologies from each cloud platform. Currently, I find the cloud most useful for storage and bandwidth, because it can improve the usability experience for users accessing your content from Internet connections that have different speeds than are available within your organization. R

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