

ESG Lab Review

Microsoft StorSimple 8000 Series Array

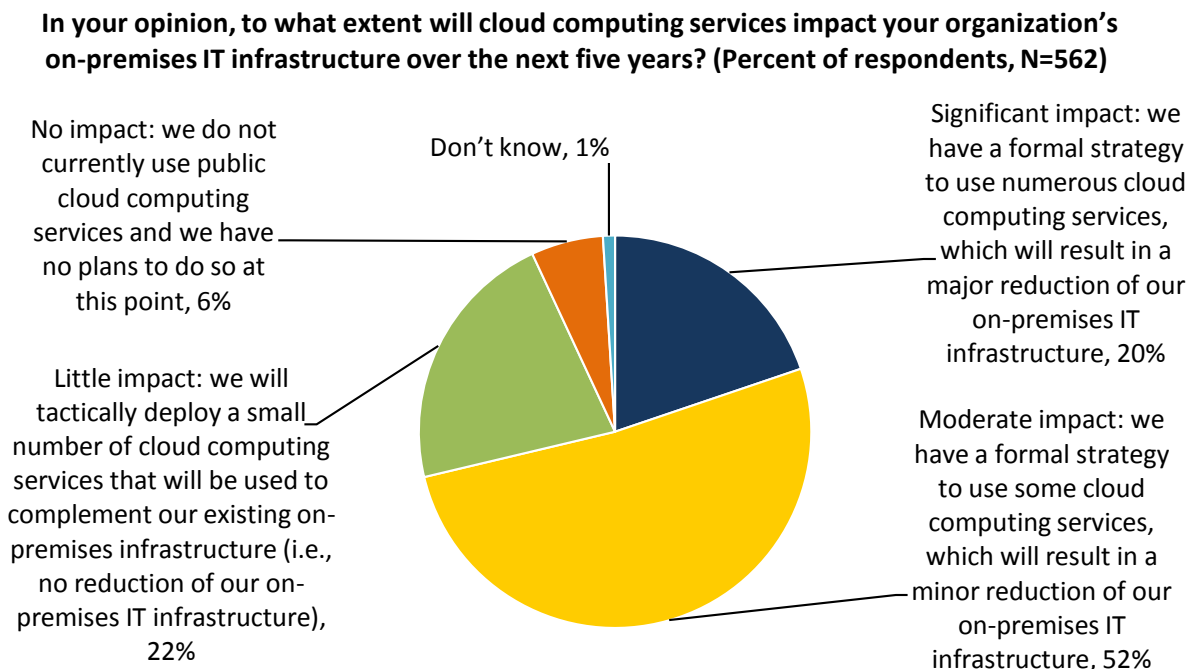
Date: June 2014 Author: Mike Leone, ESG Lab Analyst

Abstract: This ESG Lab review documents the results of independent, hands-on testing of the Microsoft Azure StorSimple solution for hybrid cloud storage using StorSimple 8000 series arrays and Windows Azure Storage. Testing focused on the consolidated management model, integration with leading virtualization layers including Microsoft Hyper-V and VMware vSphere, and improved data protection functionality using the new Microsoft Azure StorSimple Virtual Appliance service.

Cloud Adoption

Many IT organizations are leveraging the benefits of the cloud. Whether it be tactical usage for complementary IT services or major replacement of on-premises IT, the cloud can help organizations of all sizes control costs and increase agility. According to recent ESG research (see Figure 1), the majority of organizations that don't already have a formal cloud computing strategy expect to put one in place within the next five years.¹ This is a good indicator of a growing understanding about the cloud and how it can help. Though one of the results of the continued shift from the data center to the cloud is the reduction of on-premises resources, the complete replacement of existing onsite infrastructure is unlikely in the short term, especially for larger organizations. Organizations will also need to learn and adjust to new approaches to operate, manage, and govern these "outside" services.

Figure 1. Expected Impact of Cloud Computing on On-premises IT Infrastructure



Source: Enterprise Strategy Group, 2014.

Going forward, key benefits of cloud computing, such as reduced IT infrastructure costs, faster resource provisioning, and improved "time to value" will give both early and potential adopters the confidence to entrust more critical applications and processes to cloud services over time.

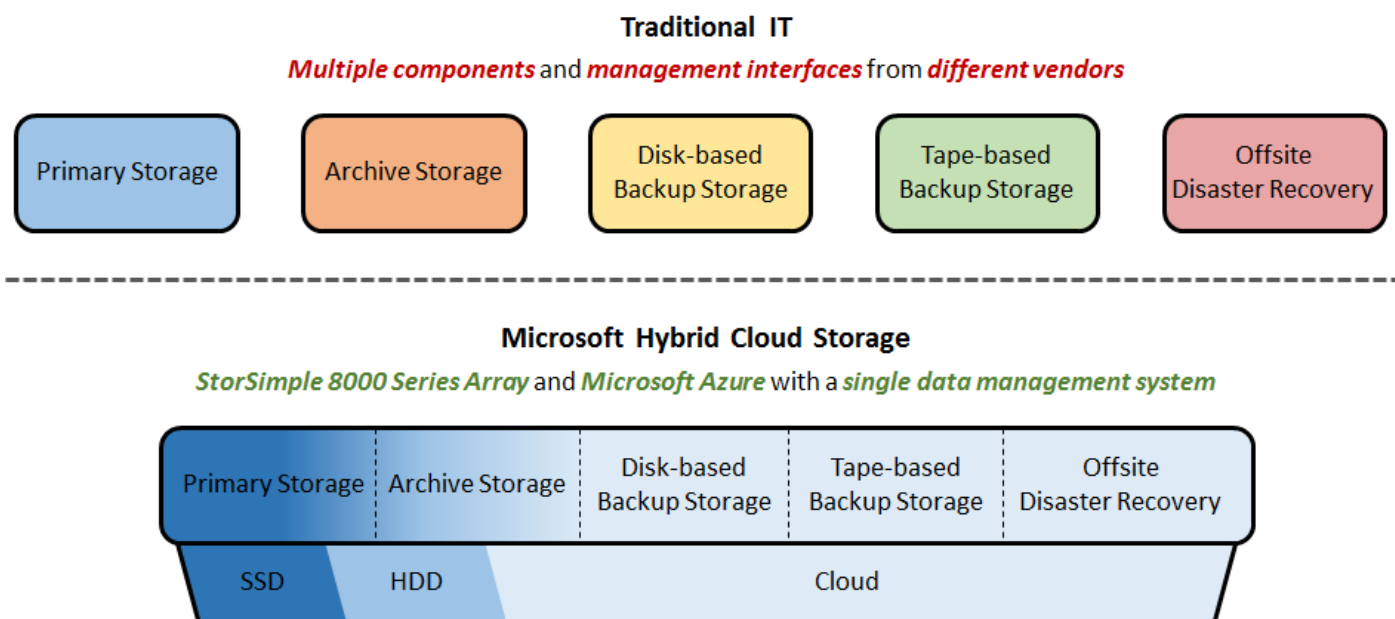
¹ Source: ESG Research Report, [2014 Public Cloud Computing Trends](#), March 2014.

Simplifying the Traditional Storage Infrastructure

Managing and monitoring a traditional IT storage infrastructure is a complex task for IT. The environment usually consists of a mix of hardware, software, and service components from multiple vendors to address the storage needs of different data sets at different stages of the storage lifecycle.

Looking at the top of Figure 2, ESG shows five key storage areas that cover the lifecycle of data within a traditional IT infrastructure. First, primary storage consists of a mix of high-performing flash storage for hot data and spinning drives for hot data overflow. Next comes storage associated with archives, which help to meet short- to long-term data retention requirements. This storage tends to come in the form of higher capacity spinning drives, yielding lower performance, but at a lower cost. To help minimize backup and restore windows, a disk-based backup storage solution would be used, as well as a tape-based backup solution to have multiple copies of the data. The copies of data will then be shipped offsite to different locations for offsite disaster recovery and geo-redundancy. The cost and complexity is obvious: multiple storage solutions, different vendors, different management interfaces, and constantly growing data sets.

Figure 2. Replacing Traditional Storage with Hybrid Cloud Storage



Using a Microsoft hybrid cloud storage approach that combines a StorSimple 8000 series array and Windows Azure public cloud storage, organizations get the performance and capacity benefits of an on-premises SAN storage solution with the elasticity and agility of cloud-based storage. A StorSimple and Windows Azure hybrid cloud storage solution helps to simplify an organization’s storage architecture by reducing five or more traditional infrastructure components to two main storage components under the control of a single data management system.

The on-premises StorSimple array combines three tiers of storage: SSD, HDD, and cloud storage. The SSD tier stores the most recently accessed data and provides the highest performance and lowest cost per IOP. The HDD tier handles data sets that are less frequently accessed and offers a balance of performance and capacity. The lowest-cost, most scalable cloud storage tier is meant for inactive data. With the lowest cost per GB, cloud storage is also used for offsite, online data protection and longer retention archival storage.

The Microsoft solution is meant to replace traditional IT infrastructure implementations having separate and distinct primary and secondary storage while providing DR capabilities that fill the sizable gap between offsite tape and remote replication solutions. Another benefit of Microsoft’s hybrid cloud storage approach comes in terms of economics. With a pay-as-you-go and pay-as-your-grow storage approach, there is no need for organizations to over-provision to account for data growth. Instead, the capacity needs are met by on-demand Azure storage as primary storage and archival storage extends to the cloud.

Consolidated Management

The new StorSimple 8000 series arrays leverage a new, hybrid cloud management model that uses a Microsoft Azure web portal. Through the Microsoft Azure StorSimple Manager service, IT storage administrators can manage all on-premises StorSimple arrays and StorSimple Virtual Appliances from anywhere with an internet connection. This improved management approach from the previous StorSimple model helps to consolidate everything from storage and data management to data protection scheduling, retention, and expiration policies.

ESG Lab simulated the process a new customer would go through when adding a new StorSimple 8000 series array to their infrastructure with a goal of showing the ease of management and configuration offered by the Microsoft Azure StorSimple Manager. After logging into the Manager, a new StorSimple service tab can be clicked, which displays *all* the managed StorSimple arrays regardless of geographic location. As shown in Figure 3, ESG Lab created a new StorSimple Manager named *ESGDemo0610* and applied a valid subscription account. Note that a new storage account was not created in this example due to the availability of an existing account.

Figure 3. Creating a StorSimple Manager



After the StorSimple manager account was created, ESG Lab added a new device, which was the new StorSimple array. From the physical array side, the only hands-on requirements to link the physical array to the Manager are plugging in the system to the internet and supplying a registration key. After that has occurred, all management and configuration tasks are done through the Manager. In this example, the new device was given the name *ESGDemo0610_t0*.

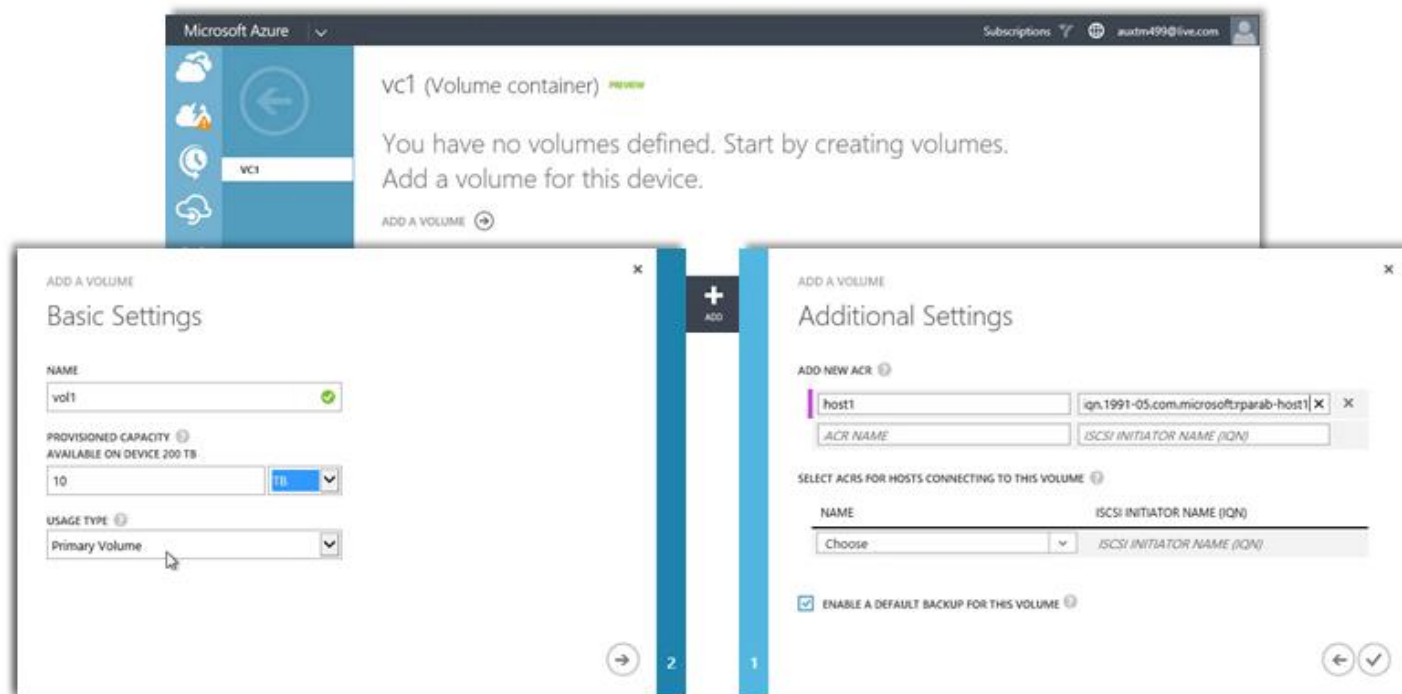
Next, ESG Lab created a volume container on the device (see Figure 4). Volume containers replace the previously named StorSimple Access Groups, which help to map server and initiator parameters to specific volumes within the containers. The new volume was named *VC1*, *ESGDemo* was selected as the storage account, and cloud storage encryption was selected. All data transferred to the cloud (data in motion) and stored in the cloud (data at rest) is encrypted with AES-256 encryption. The encryption key is specific to a single StorSimple customer and accessible only to them, ensuring primary data, archives, and backups are always secure.

Figure 4. Creating a Volume Container



After the volume container was created, ESG Lab created a new volume within the container. A configuration wizard was used to create the volume (Figure 5). The first step included specifying basic settings like name (*vol1*) and size (10TB), while the second step required the name of an access control record (ACR). ACRs contain information about iSCSI initiators that when mapped to a volume, specify which initiators are able to access which volume.

Figure 5. Adding a Volume



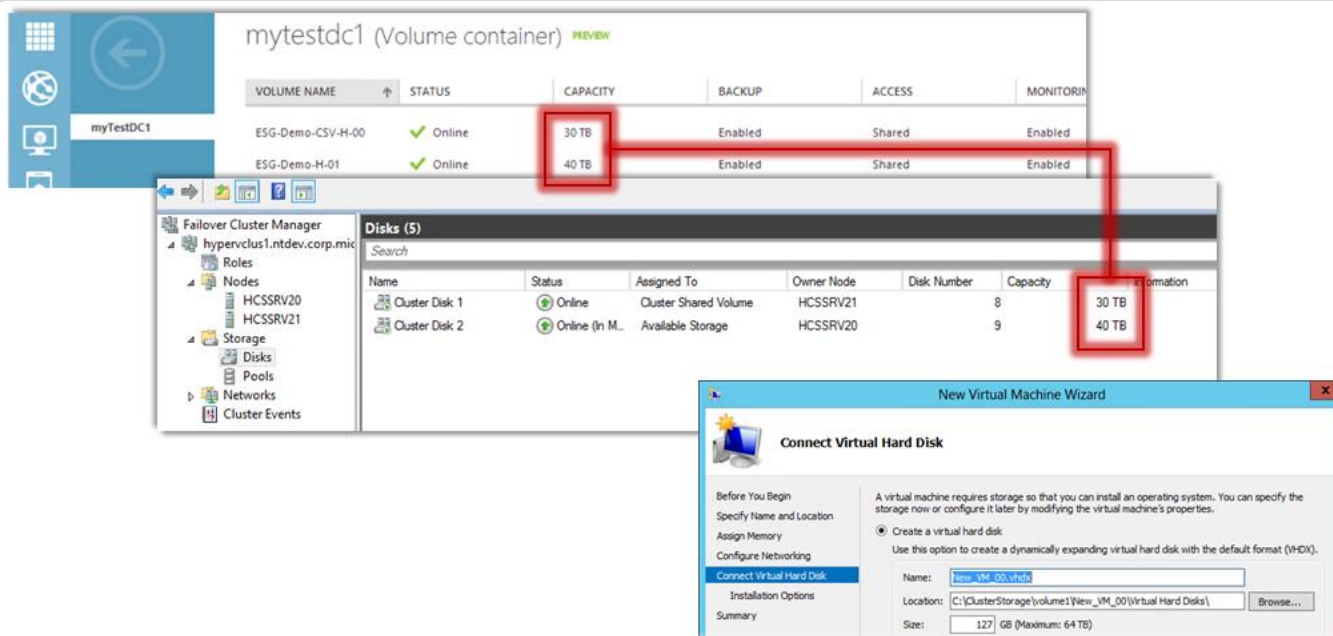
After the volume was successfully created, ESG Lab mounted the volume to an available server. Two pieces of information were required to mount the new volume to the server. First, the initiator name used during volume creation had to match that of the server. Second, the IP address of the device was required, which can be found in the Manager via the device configuration tab. From the iSCSI Initiator Properties screen on the server, ESG Lab entered the IP address of the device as the target and clicked the “quick connect” button. After refreshing the list of available disks in the disk management window, the 10TB volume was available.

Integration with Microsoft Hyper-V

After creating volumes for physical servers, ESG Lab evaluated integration with industry-leading hypervisor providers. Integration with Microsoft Hyper-V is crucial, not only because StorSimple is a Microsoft-owned entity, but also because an enormous number of organizations depend on virtualized instances of mission-critical Microsoft applications like SQL Server and SharePoint. StorSimple enables the use of Microsoft Azure to help support these applications and their continuously growing data requirements.

ESG Lab used the Manager to create two cluster shared volume containers for an existing Hyper-V deployment. The first volume was 30TB, while the other was 40TB. Once the containers were created, the volumes were connected to the Hyper-V server, formatted, and brought online. Once online, ESG Lab navigated to the Hyper-V Manager interface, where a Hyper-V instance was selected and a new virtual machine was created. The new virtual machine wizard was used where the newly created cluster shared volume was selected to store a 127GB VHD of the new virtual machine. A view of the two interfaces showing the cluster shared volumes and the new virtual machine wizard is shown in Figure 6.

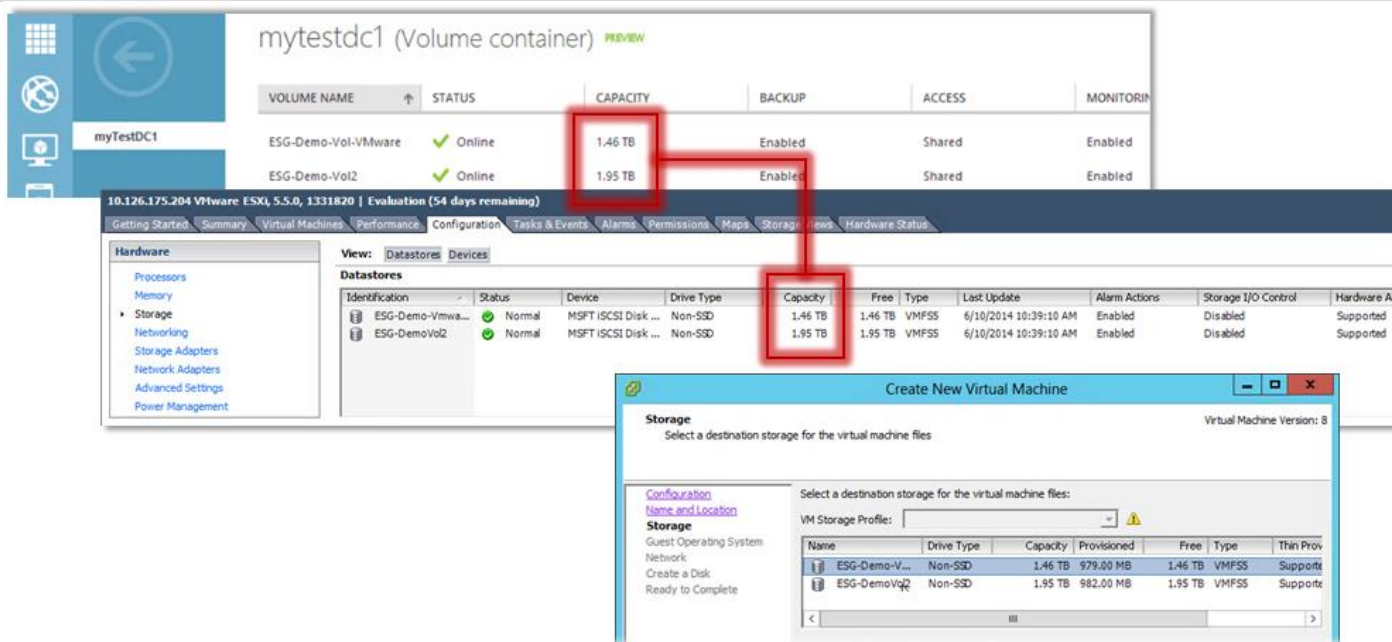
Figure 6. StorSimple Integration with Microsoft Hyper-V



Integration with VMware vSphere

StorSimple also integrates with VMware vSphere and this is done in two ways. The first is from a management and configuration standpoint. Volume containers can be created from the Azure StorSimple Manager and then get added through the vSphere management interface as datastores. New virtual machines can then be created that utilize those datastores. Like the Hyper-V scenario, ESG Lab went through this whole process with vSphere and highlights are shown in Figure 7.

Figure 7. StorSimple Integration with VMware vSphere



The second way StorSimple integrates with VMware is through VMware vSphere Storage APIs—Array Integration (VAI). These APIs enable communication between vSphere hosts and the underlying StorSimple hybrid storage array to provide storage hardware acceleration by offloading functionality directly to the StorSimple device. With this increased efficiency, the VMware host can perform virtual machine and storage management operations faster, while consuming fewer hardware resources.

Why This Matters

Managing a traditional storage IT infrastructure with different components from different vendors with different management interfaces is a complex task for even the most seasoned IT veterans. The complexity only gets worse with the addition of virtualization. With organizations shifting to a multi-vendor hypervisor approach for ultimate flexibility in better supporting different application workloads, reducing costs, and supporting legacy products, ease of use is more important than ever. IT administrators want an easy-to-manage and easy-to-use technology solution that helps to streamline tasks and improve productivity for both IT and end-users.

ESG Lab validated the improved management experience of StorSimple 8000 series arrays. By using the Azure StorSimple Manager, IT administrators can manage every geographically distributed StorSimple array from a single interface. Once a StorSimple array is connected to the internet and linked to an Azure account, organizations can be completely hands-off with the on-premises hardware. Storage was provisioned directly from the Manager and was easily mounted to a physical server within the network of the StorSimple array. ESG Lab also verified StorSimple storage integration with key hypervisor technology vendors like Microsoft and VMware by quickly provisioning volumes, connecting to the virtualization servers, and creating new virtual machines with the newly connected storage. For VMware, there is also VAAI support, which helps to complete storage tasks faster by offloading functionality to the StorSimple array.

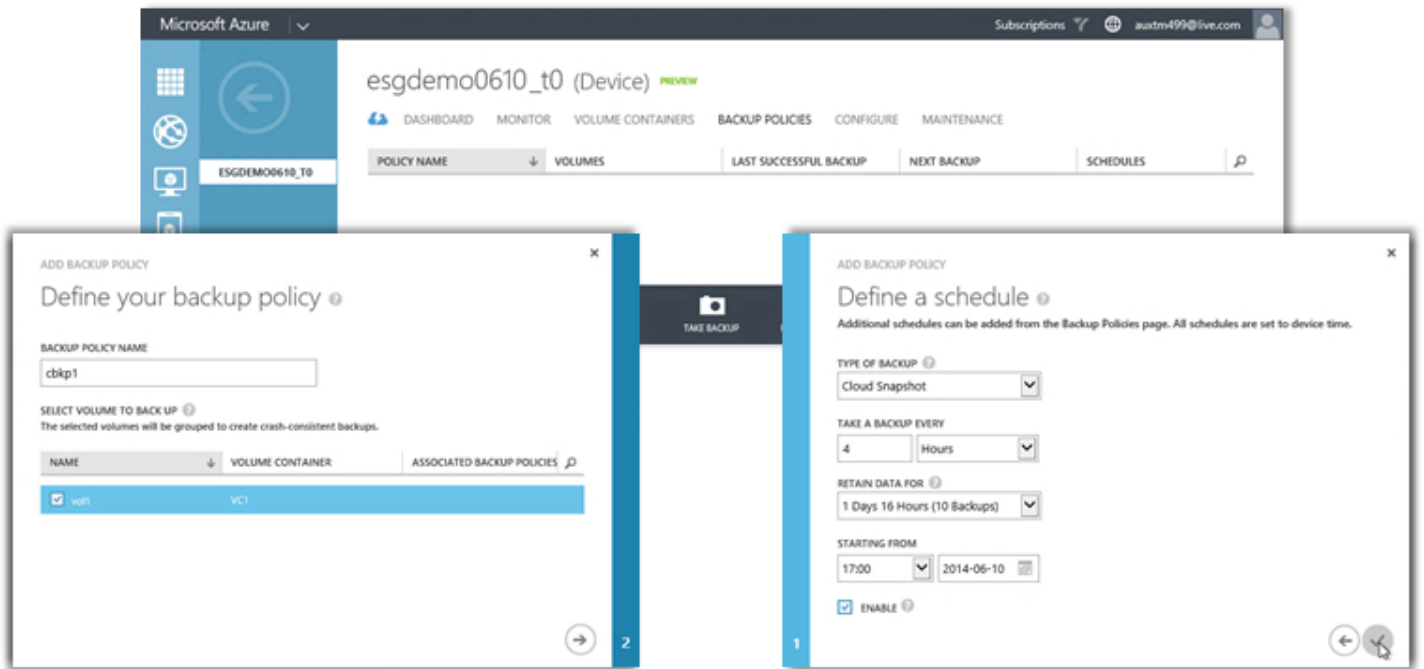
Automated and Accelerated Data Protection

Traditional, local snapshots help preserve data volumes at a particular point in time and are often stored relatively close to the primary data set they are protecting. StorSimple offers this same functionality within its arrays, but extends it to the cloud, with cloud snapshots. By leveraging the cloud, there is virtually no limit on the amount of data that can be stored and protected due to the lack of capacity constraints. Cloud snapshots work as an incremental-only process, meaning only new or change data is uploaded. This creates an efficient, less risky approach to data protection that always completes quickly.

By using the Azure cloud as a primary means of data protection, disaster recovery and geo-redundancy is built in, providing instant access to protected data via two methods. The first method requires a new, fully operational StorSimple array. Once connected and linked to an existing Azure Storage service, cloud snapshot data is mounted remotely and presented as an on-premises virtual volume. As data is accessed, the array downloads the data, gradually returning the working set of data to the array. The second method uses the newly developed Microsoft Azure StorSimple Virtual Appliance service running in Azure to access cloud snapshot data. This is available as a cloud-resident alternative to an on-premises StorSimple array that provides DR capabilities for customers who do not have multiple StorSimple arrays or a spare StorSimple array available at the time of a disaster. This Virtual Appliance approach is not meant to replace an on-premises array to serve applications running in an enterprise data center, but instead makes data accessible to applications running in VMs in Azure.

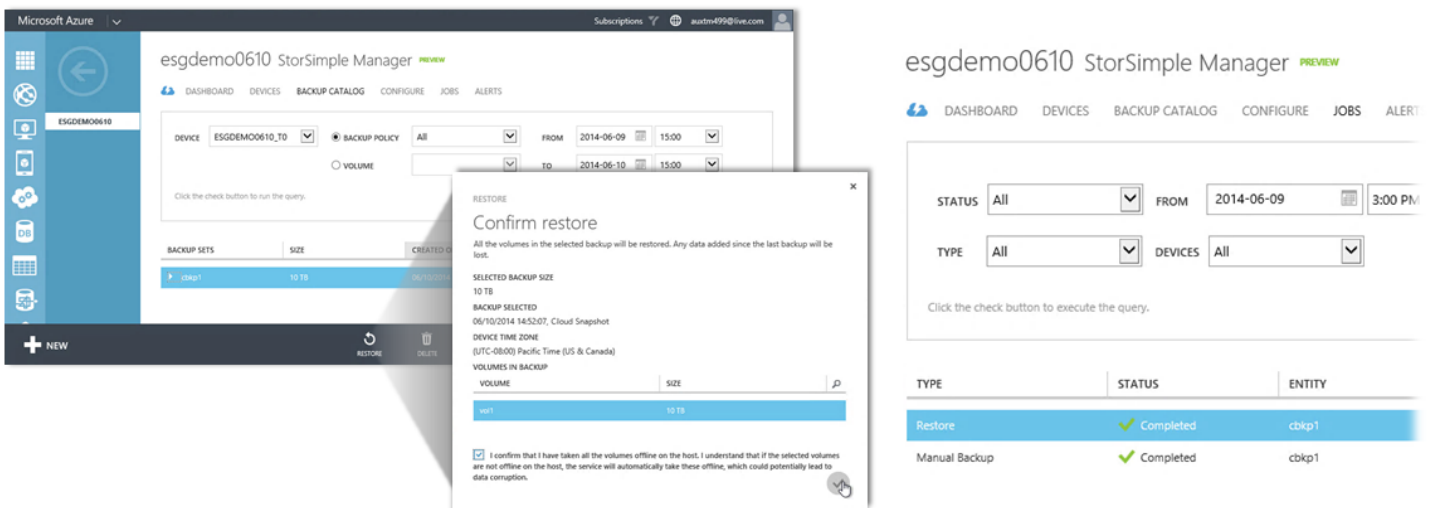
ESG Lab walked through two data protection scenarios with a goal of highlighting the simplicity of configuring and recovering from a cloud snapshot. The first scenario simulated the steps required to configure a backup policy, manually take a cloud snapshot, and then recover an accidentally deleted file from the cloud snapshot. Figure 8 shows the two-step process of defining a new backup policy. From the *Backup Policies* tab of ESG Lab's StorSimple array, a two-step wizard was launched to help with the policy creation. Step one included specifying the name and selecting the volume to back up. The second step included all the common data protection parameters like number of backups, retention periods, and schedules. Also part of this step was specifying the type of backup, which could be a local snapshot that would be stored on the StorSimple array, or a cloud snapshot, which would be stored in the cloud. ESG Lab selected a cloud snapshot, enabled it, and then manually started the backup. The policy creation wizard is shown in Figure 8.

Figure 8. Creating a Backup Policy



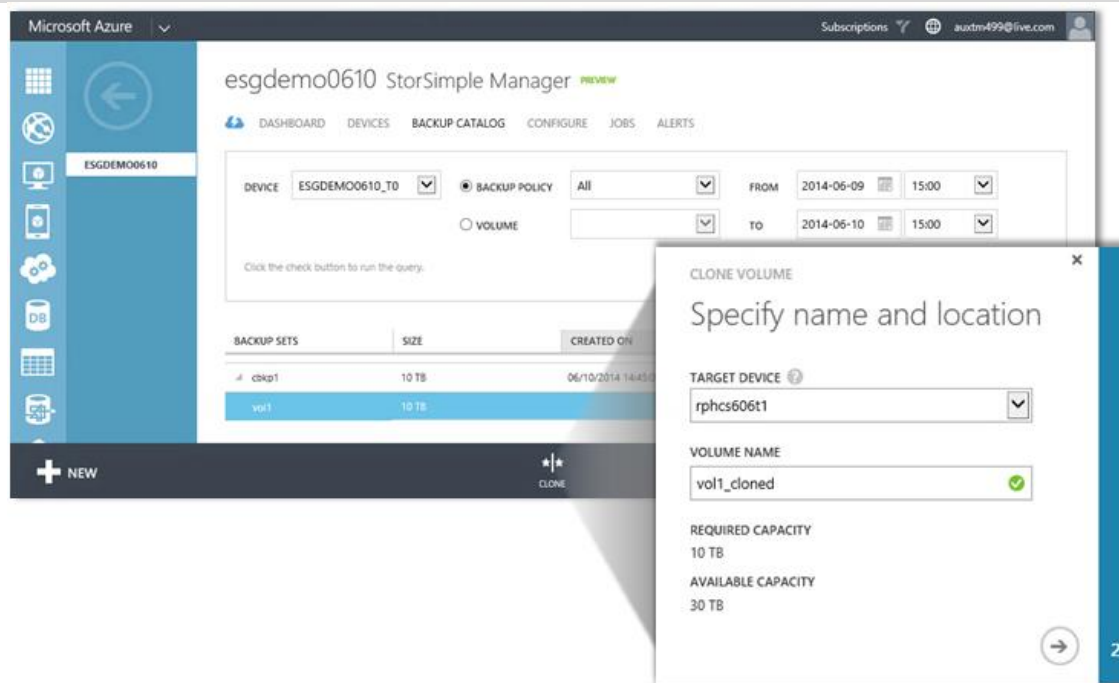
Once the backup had completed, ESG Lab navigated to the server where the volume was mounted and deleted a folder and text file. The volume was then ready to go through the restore process to bring back the accidentally deleted content. From the *Backup Catalog* tab within the top level StorSimple Manager interface, the recently completed cloud snapshot job was visible for the specified StorSimple array. ESG Lab selected the backup set, clicked *Restore* in the bottom menu bar, confirmed the volume that was going to be restored, and initiated the restore process. Then by navigating to the *Jobs* tab within the same interface, the restore process could be monitored. Once the status of the restore displayed as being complete, ESG Lab went back to the server and reconnected to the volume, and the volume was back to its original state with the folder and text file. The steps that were completed using the Manager are shown in Figure 9.

Figure 9. Restoring from a Backup



The second data protection scenario focused on the newly added functionality of a StorSimple Virtual Appliance. A disaster was simulated where access to ESG Lab's physical StorSimple array was completely lost. From the *Backup Catalog* tab, a recently completed cloud snapshot was available to restore from. ESG Lab selected the volume from within the backup set and clicked *Clone* in the bottom menu bar. When cloning the volume, a target device needed to be specified and due to the simulated disaster, the physical StorSimple array was not available. Instead, ESG Lab selected the Virtual Appliance as the target device and entered a name for the cloned volume (see Figure 10). On the next screen, information about the host and ACR were entered and once the iSCSI initiator on the host was properly configured, the cloned volume was available.

Figure 10. Restoring from StorSimple Virtual Appliance



Why This Matters

The challenges with data protection policies and strategies, especially for long-term data retention, are no secret. ESG research shows that 88% of surveyed organizations have experienced at least one challenge when it comes to data protection, with the most common challenges revolving around management of the archival platform and its data/storage.² With data growing at an incredibly fast rate, the challenges will only get worse. IT professionals are constantly looking for better ways to more efficiently protect these growing data sets at an affordable price with less risk.

ESG Lab confirmed that with an improved management interface through the Microsoft Azure StorSimple Manager, IT administrators can easily protect data both on-premises and in the cloud. Defining backup policies was easy with an intuitive, two-step process where common data protection parameters like backup and retention schedules were entered for a particular volume. ESG Lab completed a manual cloud snapshot, simulated an accidental file deletion, and then quickly recovered from the cloud snapshot. ESG Lab also verified the new StorSimple Virtual Appliance functionality by simulating a disaster. A cloud snapshot was cloned and then, through the Virtual Appliance, the recovered volume was easily mounted to instantly gain access to all the files. This reaffirms why the new StorSimple 8000 series array has such short recovery time objectives, which enables IT administrators to easily test DR plans without causing any disruptions to data center operations.

² Source: ESG Research Report, [Backup and Archiving Convergence Trends](#), April 2014.

The Bigger Truth

The transition of IT services, resources, and applications to the cloud is underway, and many organizations have already been realizing the benefits. Increased agility, lower costs, and improved efficiency are just a few of the many ways the cloud is helping to address business continuity and productivity concerns as data sets keep growing and affordable options for managing them are becoming more limited. Particularly from a storage standpoint, a complete transition to the cloud is still a longer term objective because some primary applications and data sets require the logistical and performance benefits of having a storage system onsite. Because of this requirement, organizations are looking for easy ways to take advantage of the benefits of both on-premises storage systems and cloud storage.

Microsoft StorSimple understands this challenge and with its 8000 Series hybrid storage array, organizations can take advantage of the performance benefits of an on-premises StorSimple array with high-performing SSDs for hot data sets, while leveraging on-demand storage from Windows Azure for longer-term data retention and protection needs. All storage functionality and management tasks are centrally controlled from the Microsoft Azure StorSimple Manager, including all primary, backup, snapshot, archive, and offsite storage management. And with the addition of a StorSimple Virtual Appliance, on-premises data is always available to VMs running in Azure for dev/test and recovery from a major disaster.

ESG Lab confirmed that the new management capabilities that come with the Manager help streamline traditional storage tasks for globally managed StorSimple devices. Creating a volume container, provisioning a volume, and protecting that volume were all completed quickly and easily via intuitive wizards with minimal steps. This included storage provisioning and management tasks relating to virtualized infrastructures that leverage Microsoft Hyper-V and VMware vSphere. A cloud snapshot was taken to help recover from an accidental file deletion and the new, StorSimple Virtual Appliance provided instant access to data after a simulated disaster.

Since the last hands-on [ESG Lab Validation of StorSimple](#) technology, ESG Lab has been a major proponent. The Manager for converged management of all StorSimple devices and integration with Microsoft Hyper-V and VMware vSphere are welcome additions to the StorSimple stack. Factor in the always improving data protection capabilities that are backed by the Azure cloud, and StorSimple is making it easy for organizations to transition out of the traditional storage IT infrastructure mold and into a sleek, new approach that is built for the future.

The goal of ESG Lab reports is to educate IT professionals about data center technology products for companies of all types and sizes. ESG Lab reports are not meant to replace the evaluation process that should be conducted before making purchasing decisions, but rather to provide insight into these emerging technologies. Our objective is to go over some of the more valuable feature/functions of products, show how they can be used to solve real customer problems and identify any areas needing improvement. ESG Lab's expert third-party perspective is based on our own hands-on testing as well as on interviews with customers who use these products in production environments. This ESG Lab report was sponsored by Microsoft StorSimple.

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