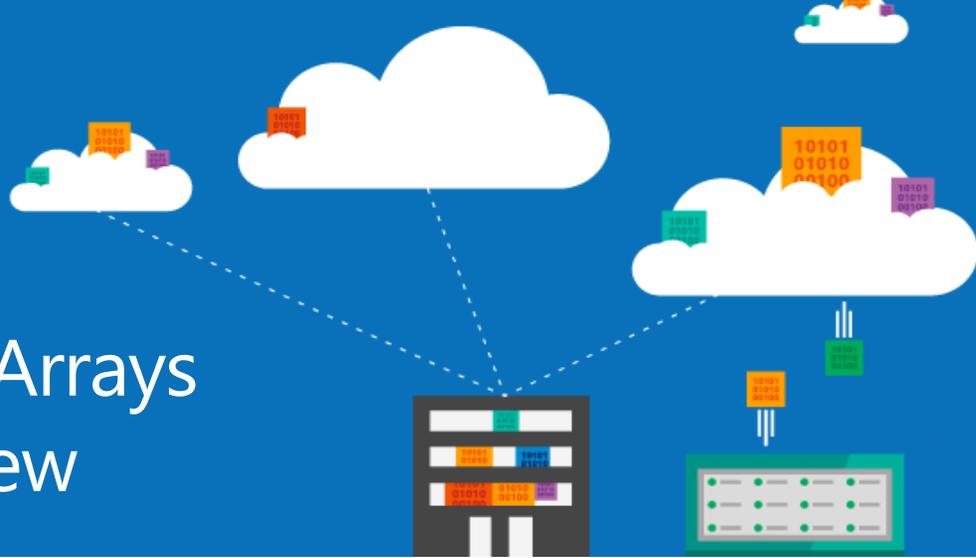Microsoft Azure StorSimple

8000 Series
Hybrid Storage Arrays
Solution Overview

With worldwide data doubling every two years, IT teams spend an inordinate amount of time and money improving their storage infrastructures instead of implementing technology solutions that improve business productivity. Microsoft Azure StorSimple 8000 series hybrid storage arrays help customers shift their attention from their storage infrastructures to other projects by breaking the cycle of storage purchases driven by data growth and automating time-consuming data protection and storage capacity scaling.

StorSimple 8000 series hybrid storage arrays at a glance

8000 series hybrid storage arrays integrate cloud services with hybrid storage technologies. They use three different kinds of storage in a tiered structure that matches three broad classes of data. The top tier uses SSDs (solid state disks) for data that was most recently accessed, the second tier uses HDDs (hard disk drives) for data that is accessed less frequently and the third tier uses cloud storage for data that is inactive and for off-site data protection. Array software determines which tier data is placed and provides quality of service for storage. The SSD tier provides the lowest cost per IOP (IOs per second), the cloud tier provides the lowest cost per GB and the HDD tier provides a balance between optimal performance and capacity. Figure 1 below illustrates the three tiers in the 8000 series arrays.
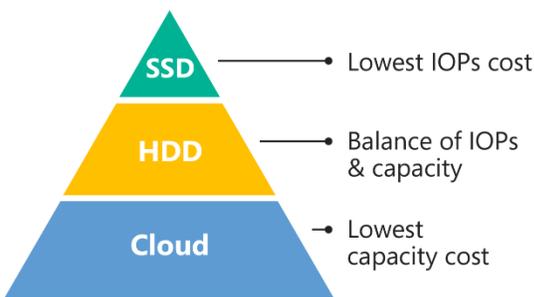

Figure 1. Storage tiers in a StorSimple 8000 series hybrid storage array

The topology of 8000 series arrays includes both an iSCSI SAN and an Internet connection. The iSCSI SAN connects servers to 8000 series arrays and the Internet connection links 8000 series arrays to the cloud as shown in Figure 2., and supports connectivity to clouds such as Microsoft Azure, Azure Government, Amazon Web Services (AWS) and OpenStack. With respect to AWS, StorSimple supports connectivity to Amazon S3 and Amazon S3 with RRS. With respect to OpenStack, StorSimple supports connectivity to OpenStack based clouds such as HPCS private cloud – management of StorSimple remains via the Azure portal.
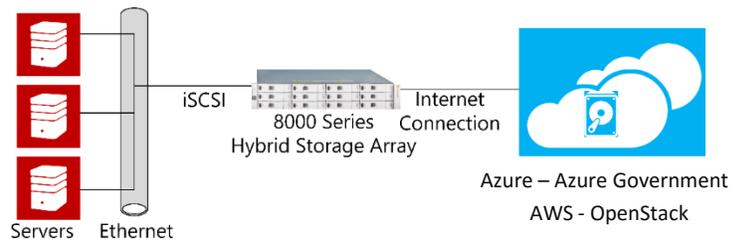

Figure 2. Network topology of 8000 series hybrid storage arrays

StorSimple 8000 series and Azure Government Cloud

The 8000 series supports Azure Government, which is a physical and network-isolated instance of Microsoft Azure, operated by screened U.S. persons with all data, applications and hardware residing in the continental United States, and committed to meeting rigorous compliance requirements and government policies.

Microsoft

Customers can run a commandlet to set the cloud platform on their StorSimple device to Azure Government, prior to registering their StorSimple device on the Azure Government Portal. By setting this option, all data, including tiered data, backups as well as StorSimple Virtual Appliances, will be stored in the Azure Government cloud, and managed though the Azure Government Portal. Setting this option also enables the FIPS mode of operation on the StorSimple device. StorSimple 8000 series cryptographic modules have completed validation to the Federal Information Processing Standard - FIPS 140-2

Consolidate management over an Internet-connected control plane

8000 series arrays use a hybrid cloud management model where management information is sent across Internet connections linking on-premises 8000 series arrays to the Microsoft Azure StorSimple Manager service in the cloud. This design allows storage administrators to control any array in the enterprise from virtually any location through a management portal and consolidates management of storage and data, including data protection schedules and expiration parameters for protected data. Figure 3 shows the control plane connecting the Azure StorSimple Manager to three different 8000 series arrays and a Microsoft Azure StorSimple Virtual Appliance, which is discussed in the following section.
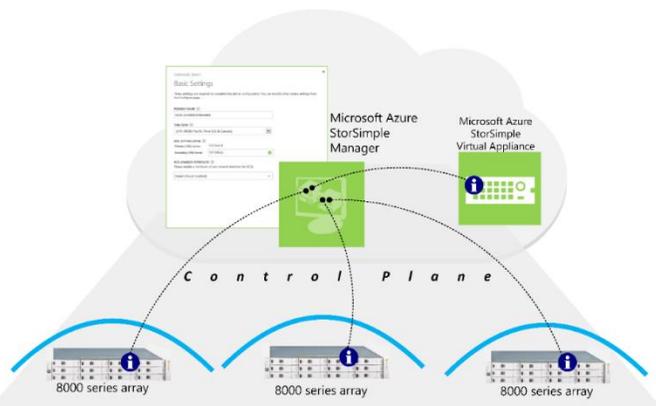

Figure 3. The Azure StorSimple Manager manages 8000 series arrays and a StorSimple Virtual Appliance over an Internet-connected control plane

Access enterprise data with applications running in Azure

The Microsoft Azure StorSimple Virtual Storage Appliance is an implementation of StorSimple technology running as an Azure service, providing applications running in Azure virtual machines (VMs) with access to uploaded data. It can be used to deploy, develop and test applications as well as for disaster recovery (DR) purposes. Customers looking to migrate on-premises applications running on Windows Server, Hyper-V, VMware and Linux platforms can use 8000 series arrays and the StorSimple Virtual Appliance to transfer their data. Having access to enterprise data in Azure enables the IT organization to use Azure IaaS services to offload constrained data center resources and use the cloud to expand their datacenter infrastructures to the cloud.

Figure 4 illustrates the relationship between Azure VMs, the Microsoft Azure StorSimple Virtual Appliance and Azure Storage where uploaded data is stored. Like 8000 Series arrays, the Virtual Appliance is managed through the StorSimple Manager.
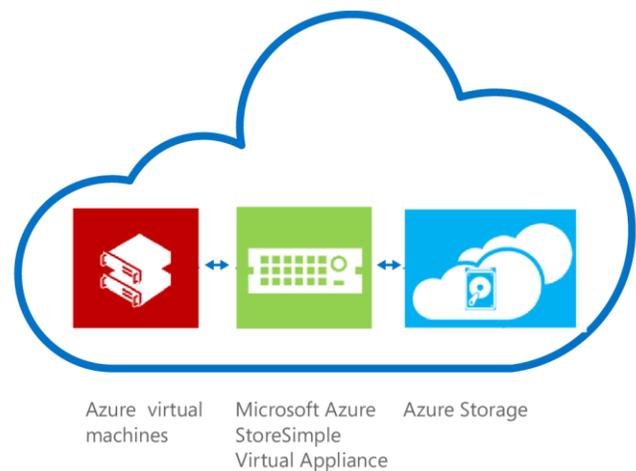

Figure 4. The Microsoft Azure StorSimple Virtual Appliance allows Azure VMs to access on-premises data uploaded by 8000 series hybrid storage arrays

Manage data growth and get rid of the anxiety of running out of capacity

High data growth is a constant irritation to many IT teams who must always be, acquiring, deploying, managing and planning storage. 8000 series arrays use data reduction technology and hybrid cloud tiering to increase storage capacity on-demand, relieving the anxiety of running out of capacity. As new data enters an 8000 series array it is initially written in raw form before it is deduplicated, or *deduped*. As data ages further, it is moved from the SSD to the HDD tier and is compressed. As the amount of deduped and compressed data approaches the capacity limits of the array, the least recently used data is automatically migrated to the cloud tier. Data that is being used by applications remains in the array and is called the *working set*. Many applications

have working sets that stay relatively constant in size over time while the amount of inactive data continues to increase and is migrated to the cloud tier. Figure 5 illustrates how data reduction and hybrid cloud tiering relieve the pressures of managing array capacity and minimize storage consumption.
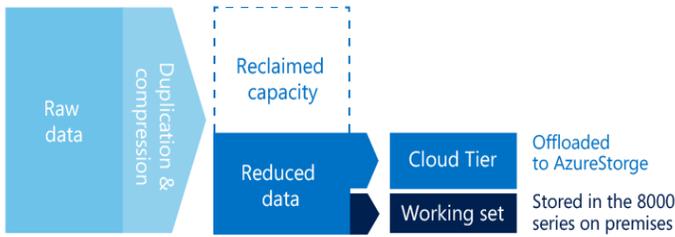

*Figure 5. Reducing data and hybrid cloud tiering minimize storage consumption on-premises*

Automate off-site data protection and accelerate disaster recovery

IT professionals are always looking for ways to protect data more efficiently with less risk. 8000 series arrays do this by automating off-site data protection using *cloud snapshots*, which are similar to local snapshots in other arrays, but are stored in the cloud without the capacity constraints that limit the amount of data that can be protected. As incremental-only processes, they complete very quickly, uploading only changed and new data. Like replication, cloud snapshots are stored remotely, but without the high cost of secondary storage systems.

If a disaster strikes, DR operations can start as soon as there is an operational 8000 series array or a StorSimple Virtual Appliance running in Azure to access cloud snapshot data there. Customers using 8000 series arrays in multiple sites can begin recovery immediately at one of their other sites, saving many hours, if not days or weeks, in the process. Cloud snapshot data is remotely mounted as synthetic full volume images that consolidate data from multiple cloud snapshots and present it to applications as a virtual volume on-premises. As applications access their data, the array downloads it from the cloud and it becomes part of the array's working set. *Instant recovery* with 8000 series arrays is very fast and avoids wasting time downloading inactive data that is not needed. These recovery efficiencies are why 8000 series arrays have such short recovery time objectives (RTOs) and enable IT teams to test DR plans without causing major disruptions to datacenter operations.

Retain data without having to dispose of it prematurely

Many IT teams have problems maintaining enough storage capacity to keep all the copies of data they are expected to in order to comply with regulations and policies. When there isn't enough capacity available, it is much easier to delete older copies than purchase and deploy more storage. StorSimple 8000 series arrays fix this problem by storing and retaining this data in the cloud where running out of capacity is not a problem.
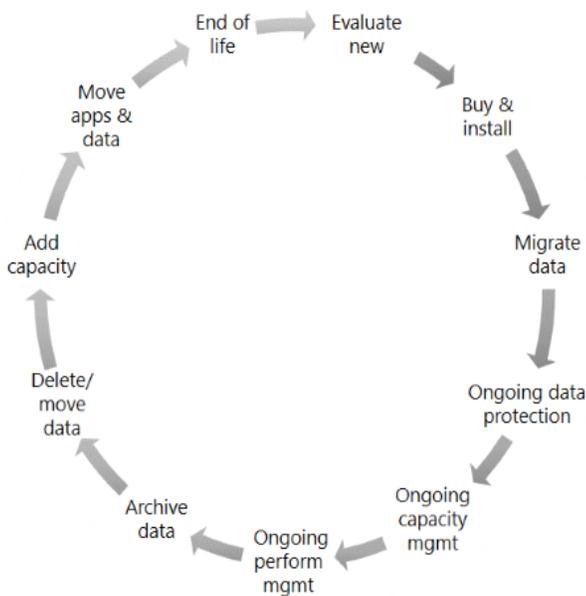
Traditional storage management tasks
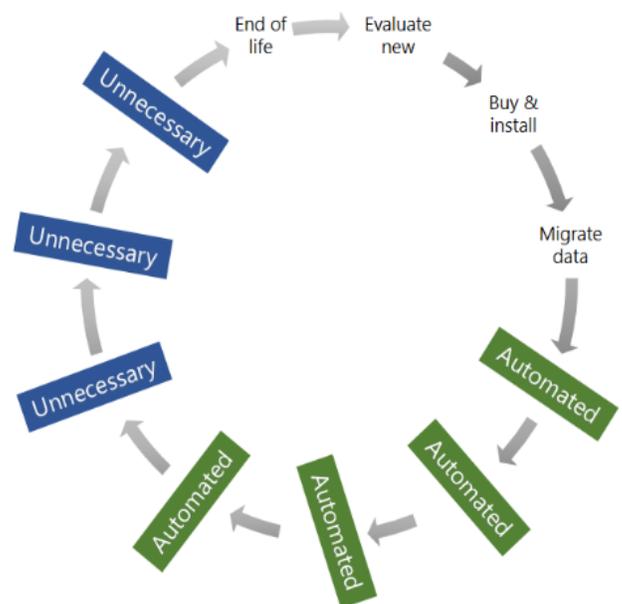
8000 series automated storage and data management tasks

Figure 6. Comparing storage management tasks for traditional storage versus 8000 series arrays

Increase IT agility with streamlined storage and data management and automation

Many of the tasks associated with storage management are either automated or unnecessary with StorSimple 8000 series arrays. Data protection, capacity management, performance optimization are all painstaking tasks that typically consume many hours, but are automated processes in 8000 series arrays. Not only that, but the tasks of moving and deleting data, adding capacity and re-balancing application workloads are unnecessary because 8000 series arrays dynamically expand storage capacity using hybrid cloud tiering. Figure 6 compares the storage management tasks used for traditional storage environments with those of the 8000 series. And topping it all off is the ability for IT professionals to add even greater, customizable, automation with a Software Development Kit (SDK) for Azure PowerShell for StorSimple, delivering greater operational and business efficiencies.

Use case scenarios for 8000 series arrays

8000 series arrays excel at solving data growth and data protection problems as well as reducing the time and effort IT teams spend managing storage. They are well-suited for use as large file shares for document management and archiving applications where historical files are seldom accessed but need to be readily available. Similarly, application development environments where there are a lot of inactive VMs make good use of 8000 series hybrid cloud tiering by storing data from "zombie VMs" online in the cloud. Data protection can be improved in most organizations, particularly for line-of-business applications that need automated off-site data protection, but without the high cost of remote replication. Moving the data for these applications to 8000 series arrays greatly improves both their protection and recoverability. Many IT teams cannot test or practice disaster recovery scenarios because it is too costly and disruptive to do. Storing data on 8000 series arrays facilitates DR testing, enabling the IT team to set realistic recovery time objectives (RTOs) for applications.

Tier 2 and 3 database applications are also good workloads for 8000 series arrays. For instance, customers can run departmental SQL Server databases on 8000 series arrays and take advantage of automated off-site data protection as well as VSS-compliant application-consistent backups.

Data Migration

When it comes to installing new storage systems and migrating data from older arrays to newer arrays, IT professionals have often found themselves confused with the complexity of the task and overwhelmed with the amount of activity needed to be accomplish it. With StorSimple confusion is eliminated and complexity is simplified: when upgrading to StorSimple 8000 series arrays from StorSimple 5000/7000 series arrays IT professionals can migrate data with our data migration tools designed specifically to ease and speed data migration.
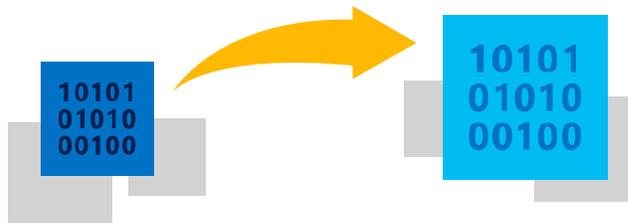
StorSimple 8100 and 8600 series arrays

There are two models of 8000 series arrays: the StorSimple 8100 and the StorSimple 8600. For more information on the specifications for these models refer to the Technical Features and Specification.

For more information visit: Microsoft.com/StorSimple

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