NetApp ONTAP Benefits for VMware vSphere Administrators

NetApp Solutions

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NetApp ONTAP Benefits for VMware vSphere Administrators

Introduction to ONTAP for vSphere Administrators

Why ONTAP for vSphere?

NetApp ONTAP simplifies storage and data management operations and distinctly complements VMware environments, whether deploying on-premises or to the cloud. NetApp best-in-class data protection, storage efficiency innovations, and outstanding performance in both SAN- and NAS-based VMware architectures are among the reasons why tens of thousands of customers have selected ONTAP as their storage solution for vSphere deployments.

NetApp provides numerous VMware plug-ins, validations, and qualifications of various VMware products to support customers facing the unique challenges of administering a virtualization environment. NetApp does for storage and data management what VMware does for virtualization, allowing customers to focus on their core competencies rather than managing physical storage. This nearly 20-year partnership between VMware and NetApp continues to evolve and add customer value as new technologies, such as VMware Cloud Foundation and Tanzu, emerge, while continuing to support the foundation of vSphere.

Key factors customers value include:

- **Unified storage**
- **Storage efficiency**
- **Virtual volumes and storage policy-based management**
- **Hybrid cloud**

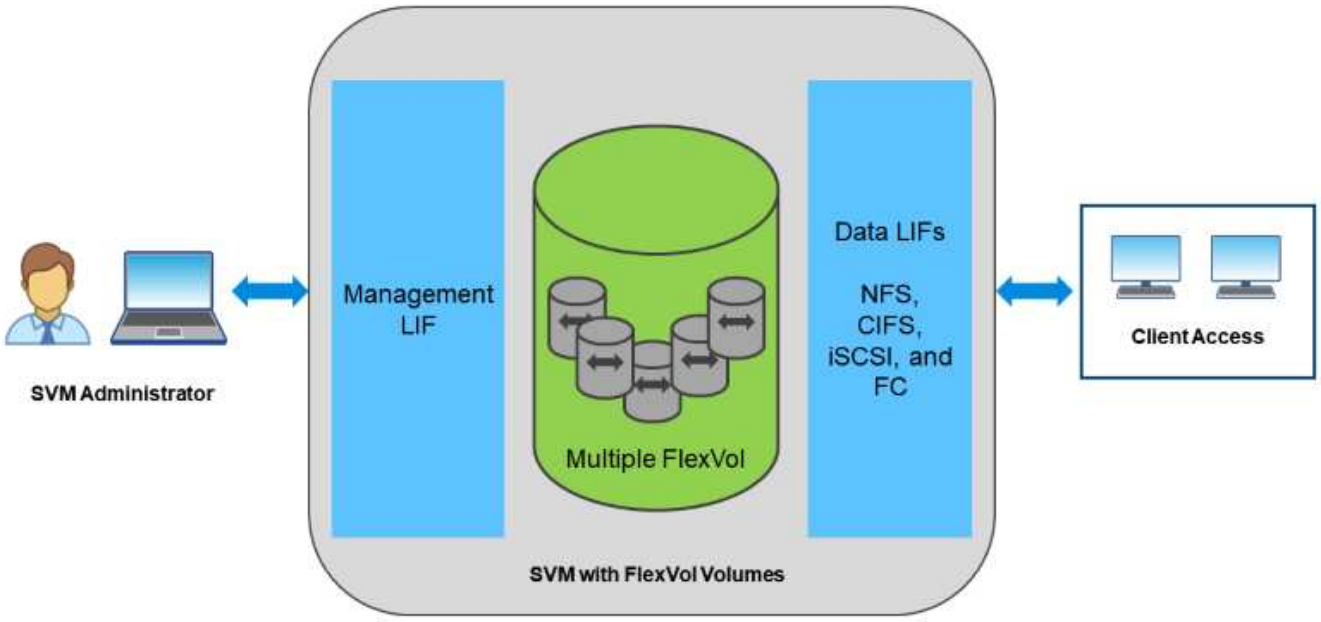
For more information regarding supported NetApp and VMware solutions, see the following resources:

- The NetApp Interoperability Matrix Tool (IMT). The IMT defines the qualified components and versions you can use to build FC/FCoE, iSCSI, NFS and CIFS configurations.
- The VMware Compatibility Guide. The VMware Compatibility guide lists System, I/O, Storage/SAN and Backup compatibility with VMware Infrastructure and software products
- NetApp ONTAP Tools for VMware. ONTAP tools for VMware vSphere is a single vCenter Server plug-in that includes the VSC, VASA Provider, and Storage Replication Adapter (SRA) extensions.

ONTAP Unified Storage

About Unified Storage

Systems running ONTAP software are unified in several significant ways. Originally this approach referred to supporting both NAS and SAN protocols on one storage system, and ONTAP continues to be a leading platform for SAN along with its original strength in NAS.
A storage virtual machine (SVM) is a logical construct allowing client access to systems running ONTAP software. SVMs can serve data concurrently through multiple data access protocols via logical interfaces (LIFs). SVMs provide file-level data access through NAS protocols, such as CIFS and NFS, and block-level data access through SAN protocols, such as iSCSI, FC/FCoE, and NVMe. SVMs can serve data to SAN and NAS clients independently at the same time.



In the vSphere world, this approach could also mean a unified system for virtual desktop infrastructure (VDI) together with virtual server infrastructure (VSI). Systems running ONTAP software are typically less expensive for VSI than traditional enterprise arrays and yet have advanced storage efficiency capabilities to handle VDI in the same system. ONTAP also unifies a variety of storage media, from SSDs to SATA, and can extend that easily into the cloud. There's no need to buy one flash array for performance, a SATA array for archives, and separate systems for the cloud. ONTAP ties them all together.

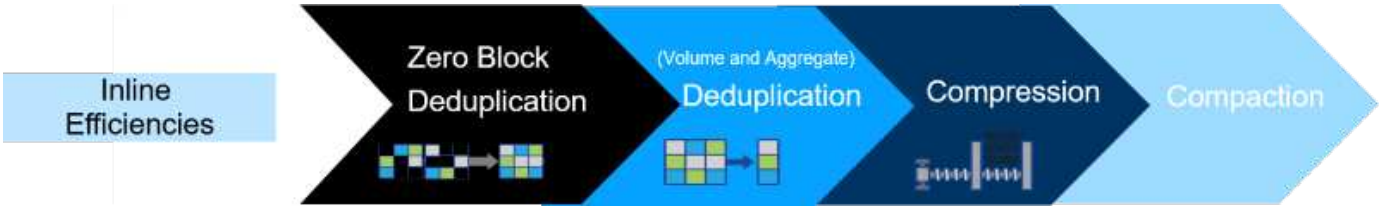
For more information on SVMs, unified storage and client access, see Storage Virtualization in the ONTAP 9 Documentation center.

ONTAP storage efficiencies

About storage efficiencies

Although NetApp was the first to deliver deduplication for production workloads, this innovation wasn't the first or last one in this area. It started with ONTAP Snapshot copies, a space-efficient data protection mechanism with no performance effect, along with FlexClone technology to instantly make read/write copies of VMs for production and backup use. NetApp went on to deliver inline capabilities, including deduplication, compression, and zero-block deduplication, to squeeze out the most storage from expensive SSDs. Most recently, ONTAP added compaction to strengthen our storage efficiencies.

- **Inline zero-block deduplication.** Eliminates space wasted by all-zero blocks.
- **Inline compression.** Compresses data blocks to reduce the amount of physical storage required.
- **Inline deduplication.** Eliminates incoming blocks with existing blocks on disk.
- **Inline data compaction.** Packs smaller I/O operations and files into each physical block.



You can run deduplication, data compression, and data compaction together or independently to achieve optimal space savings on a FlexVol volume. The combination of these capabilities has resulted in customers seeing savings of up to 5:1 for VSI and up to 30:1 for VDI.

For more information on ONTAP storage efficiencies, see Using deduplication, data compression, and data compaction to increase storage efficiency in the ONTAP 9 Documentation center.

Virtual Volumes (vVols) and Storage Policy Based Management (SPBM)

About vVols and SPBM

NetApp was an early design partner with VMware in the development of vSphere Virtual Volumes (vVols), providing architectural input and early support for vVols and VMware vSphere APIs for Storage Awareness (VASA). Not only did this approach bring VM granular storage management to VMFS, it also supported automation of storage provisioning through Storage Policy-Based Management (SPBM).

SPBM provides a framework that serves as an abstraction layer between the storage services available to your virtualization environment and the provisioned storage elements via policies. This approach allows storage architects to design storage pools with different capabilities that can be easily consumed by VM administrators. Administrators can then match virtual machine workload requirements against the provisioned storage pools, allowing for granular control of various settings on a per-VM or virtual disk level.

ONTAP leads the storage industry in vVols scale, supporting hundreds of thousands of vVols in a single cluster, whereas enterprise array and smaller flash array vendors support as few as several thousand vVols per array. NetApp is also driving the evolution of VM granular management with upcoming capabilities in support of vVols 3.0.

For more information on VMware vSphere Virtual Volumes, SPBM, and ONTAP, see TR-4400: VMware vSphere Virtual Volumes with ONTAP.

Hybrid Cloud with ONTAP and vSphere

About Hybrid Cloud

Whether used for an on-premises private cloud, public-cloud infrastructure, or a hybrid cloud that combines the best of both, ONTAP solutions help you build your data fabric to streamline and optimize data management. Start with high-performance, all-flash systems, then couple them with either disk or cloud storage systems for data protection and cloud compute.

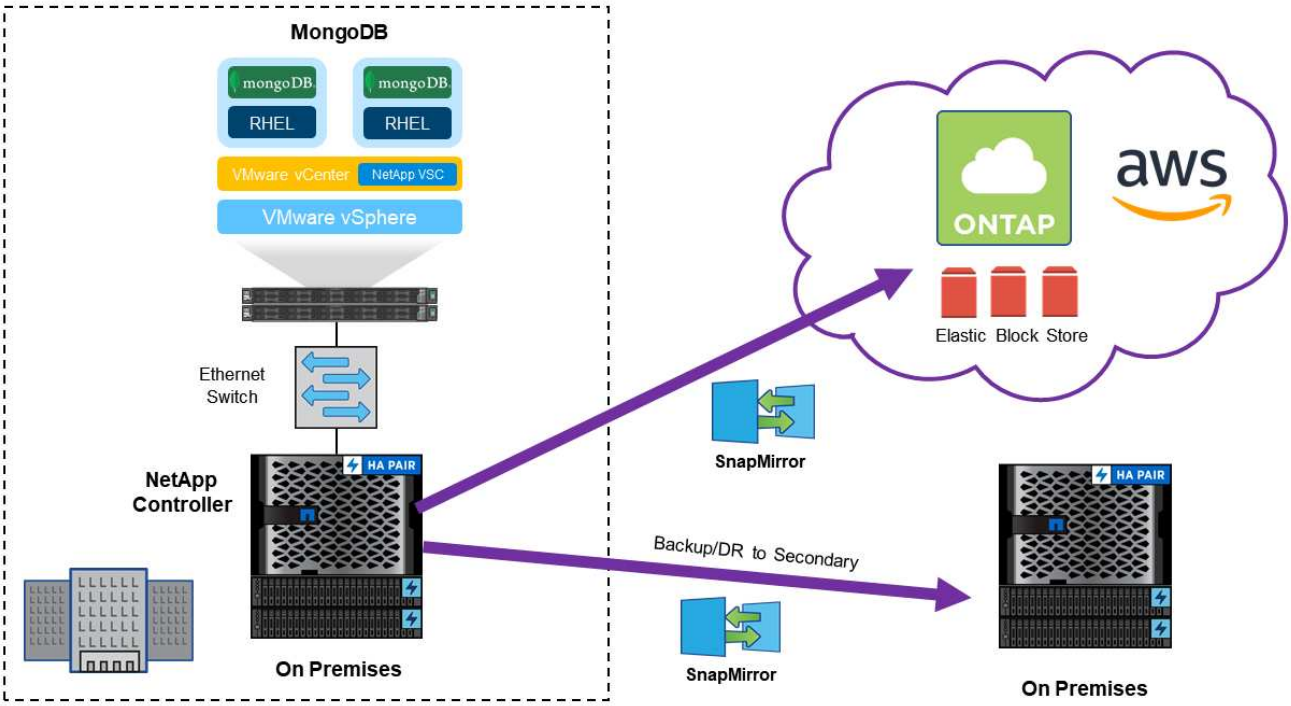
Choose from Azure, AWS, IBM, or Google clouds to optimize costs and avoid lock-in. Leverage advanced support for OpenStack and container technologies as needed.

Data protection is often the first thing customers try when they begin their cloud journey. Protection can be as simple as asynchronous replication of key data or as complex as a complete hot-backup site. Data protection is based primarily on NetApp SnapMirror technology.

Some customers choose to move entire workloads to the cloud. This can be more complicated than just using the cloud for data protection, but ONTAP makes moving easier because you do not have to rewrite your applications to use cloud-based storage. ONTAP in the cloud works just like on-premises ONTAP does. Your on-premises ONTAP system offers data efficiency features that enable you to store more data in less physical space and to tier rarely used data to lower cost storage. Whether you use a hybrid cloud configuration or move an entire workload to the cloud, ONTAP maximizes storage performance and efficiency.

NetApp also offers cloud-based backup (SnapMirror Cloud, Cloud Backup Service, and Cloud Sync) and storage tiering and archiving tools (FabricPool) for ONTAP to help reduce operating expenses and leverage the broad reach of the cloud.

The following figure provides a sample hybrid cloud use case.



For more information on ONTAP and hybrid clouds, see ONTAP and the Cloud in the ONTAP 9 Documentation Center.

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