Datasheet

NetApp Virtual Storage Console for VMware vSphere

End-to-end storage management for VMware infrastructures

Key Benefits

- Simplify storage and data management for VMware environments by enabling administrators to directly manage storage through VMware vCenter.
- Boost responsiveness with real-time discovery and reporting on storage health and usage.
- Increase availability with instant backups and restores of lost or corrupt data.
- Reduce storage costs and improve storage efficiency with thin provisioning and block-level deduplication of datastores.
- Enable a dynamic infrastructure by rapidly provisioning datastores and cloning thousands of virtual machines.
- Enhance performance with online I/O optimization and migration of misaligned VMs.

The Challenge

Data centers continue to virtualize their server and storage environments to realize the benefits of higher efficiencies and lower costs. However, this shift to virtualization creates complexities, including the need for integration between server and storage environments. Without real-time visibility into—and management of—storage health, utilization, and performance, server administrators must regularly coordinate with storage administrators to provision, configure, and optimize VMware datastores. This impedes business agility, complicates management, and increases operating costs.

The Solution

NetApp® Virtual Storage Console (VSC) for VMware vSphere is a free[1] vSphere client plug-in. VSC fully integrates with VMware vCenter to provide end-to-end lifecycle management for virtual machines (VMs) in VMware environments that use NetApp storage systems. VSC provides visibility into the NetApp storage environment from within the vCenter console. VMware administrators can easily perform tasks that improve both server and storage efficiency, but role-based access control can be used to define which operations a specific administrator can perform.

VSC leverages NetApp technologies to optimize the efficiency and performance of its comprehensive, centralized management of NetApp storage operations in both SAN- and NAS-based VMware virtual server and desktop infrastructures. These operations include discovery, health and capacity monitoring, datastore provisioning, VM cloning, backup, recovery, and VM optimization. Deploying VSC results in tighter integration between storage and server environments, greatly simplifies virtualized storage management, and helps deliver excellent performance from virtualized environments.

Key storage management capabilities

VSC for VMware vSphere enables the following key NetApp capabilities to be executed from the vSphere client:

- **Monitoring and host configuration**. Provides a view of the storage environment from a VMware administrator's perspective and optimizes storage and host configurations.

NetApp®

1. VSC is available for download at no charge to all NetApp customers; however, a NetApp SnapManager® for Virtual Infrastructure license must be purchased to activate the backup and recovery capability. A NetApp FlexClone license must be purchased to clone VMs by using the provisioning and cloning capability or when using the backup and recovery capability in NFS environments on Data ONTAP version 8.1 or earlier.

- **Back up and restore**. Automates data protection processes with policy-based backup and restore.
- **Provisioning and cloning**. Delivers end-to-end datastore provisioning, rapid VM server and desktop cloning, and flexible redeployment services.
- **Optimization and migration**. Detects VM misalignments and optimizes performance by enabling online VM I/O optimization and VM migration.

Centralized Management, Monitoring, and Host Configuration

For enhanced management efficiency in large-scale deployments, multiple VSC instances, each registered to a single vCenter server, can be managed with a single vSphere web client when those vCenter servers are managed by a single SSO instance. Additionally, VSC now offers the ability to create scripts and tools using Microsoft Windows PowerShell Cmdlets for those who prefer to use command line interface.

Understand storage utilization and health

VSC enables viewing and management of all NetApp storage systems—including the mapping of physical to virtual resources, storage system status, and storage capacity information. This benefit reduces the time it takes to identify storage issues and enables proactive resolution of problems. In addition, VMware administrators can instantly view utilization statistics for NetApp SAN- and NAS-based datastores at the volume, LUN, and aggregate levels, allowing them to make informed decisions about VM object placement. Data deduplication, thin cloning, and thin provisioning are just some of the storage-saving technologies that make NetApp integration with vCenter valuable.

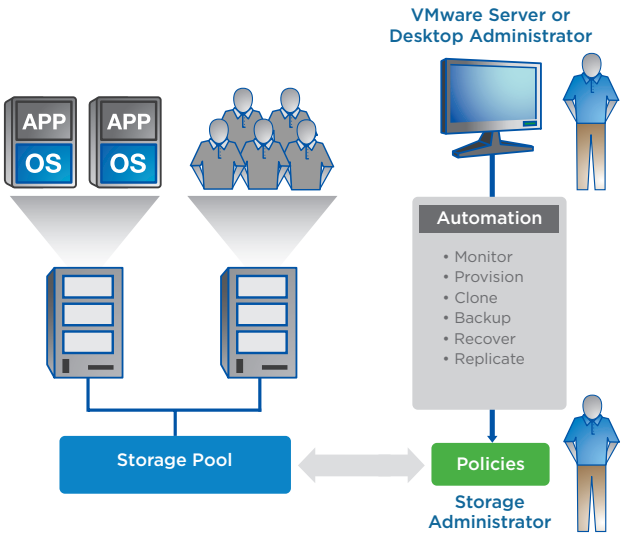

Figure 1) Empowering VMware administrators without affecting storage policies.

Discover and automate VMware storage settings

VMware administrators can easily view NetApp storage systems configured for use in the virtual infrastructure and identify the physical VMware ESX or ESXi hosts connected to each storage system. Administrators can also verify that the host bus adapter timeout, NFS tunable, and multipath configuration settings reflect NetApp best practices. If any hosts are out of compliance, administrators can select one or more hosts and execute an update to bring the settings back into compliance for optimal performance.

Improve host resource utilization and performance with VAAI

NetApp partnered with VMware to develop VMware vStorage APIs for Array Integration (VAAI). This integration enables a variety of host storage–based operations to be off-loaded to NetApp storage, improving host resource utilization and performance. VSC identifies when VAAI support is enabled on a specific NetApp storage system and enables the VM administrator to centrally install the NFS VAAI plug-in through the VSC interface.

Simplified Backup and Recovery

VMware administrators must verify that backups are completed and that restore can be initiated when needed to keep data protected and available. NetApp SnapCenter® has been integrated into VSC and provides central management for backup and recovery. VSC leverages NetApp Snapshot® and SnapMirror® technologies to create point-in-time local and remote backups that are fast, efficient, and crash consistent. VSC uses SnapVault® to restore from both local and remote backup copies (the VMware snapshot option can be selected for VMware file system crash consistency). Additionally, administrators can create "standalone" backup policies, each with a specified schedule and retention, and one or more backup policies can be associated with a backup job for maximum flexibility. Now, VMware administrators can automate VM backup processes by using a policy-based "set-and-forget" methodology that includes:

- Scheduling backups at the datastore level so that all VMs provisioned within that datastore are automatically protected
- Setting a backup retention period based on time or number of copies
- Scheduling a postbackup script to execute tasks, such as sending the latest backup to tape
- Triggering a NetApp SnapMirror or NetApp SnapVault update after every backup so that data is automatically stored on a secondary system for disaster recovery readiness or long-term retention

Guest File Restore

VSC offers virtual disk mount and unmounts that are used to facilitate mounting disks to VMs from backups. This feature allows customers to log in to the VM, mount the guest file system drives, and perform operations such as single file restore.

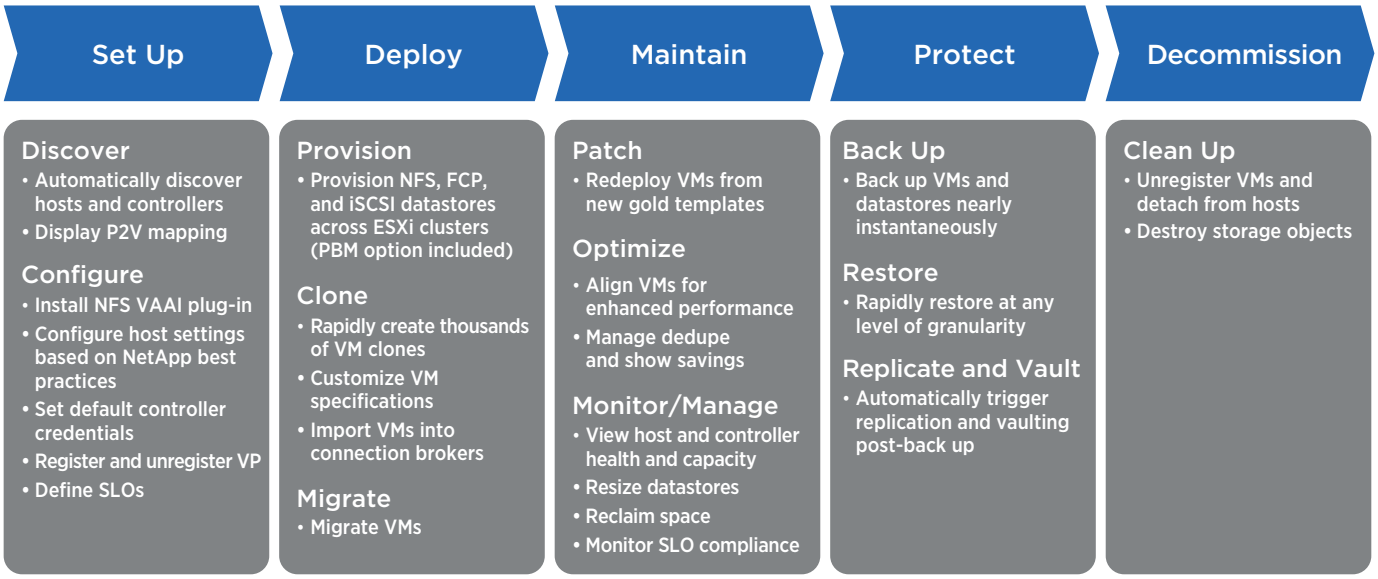

Figure 2) End-to-end storage management for VMware infrastructures.

Fast recovery time
VMware administrators can recover VMs to the most current datastore or recover individual VMDKs to a specified datastore within minutes by simply selecting the desired recovery point stored on disk.

Support for REST APIs
VSC supports RESTful APIs for all backup and recovery tasks, enabling customers to develop software that leverages VSC backup and recovery functionality but does not require using the VSC GUI.

Fast, Space-Efficient Provisioning

Cloning and redeployment
The capability to dynamically deploy virtualized resources enables a flexible data center infrastructure that quickly responds to changing business needs. VM cloning is one method for accelerating resource provisioning and scalability in VMware environments. However, typical VM cloning methods have limited scalability and can be time consuming for large cloning jobs. VSC provisioning and cloning provide extremely fast, cost-effective datastore provisioning and virtual server and desktop cloning. VMware administrators can clone thousands of VMs nearly instantaneously and manage the lifecycle of these VMs directly from vCenter. VSC eliminates lengthy customization and scripting processes, and it combines the best of NetApp cloning technology with vCenter manageability to facilitate virtual server, virtual desktop, and dynamic cloud environments.

Efficient VM datastore provisioning
VSC provides nondisruptive, end-to-end datastore provisioning from within vCenter for NFS and VMFS datastores. When coupled with the NetApp VASA Provider, VSC can provision datastores that match a predefined service-level objective. Datastores can be quickly and easily provisioned to ESX and ESXi hosts, clusters, or entire data centers, or resized and deleted. In addition, you can set policies to automatically grow datastores to meet rapidly changing business requirements.[2]

Rapid VM cloning
NetApp FlexClone® technology leverages VSC and enables the VM administrator to rapidly clone a single VM or thousands of VMs almost instantly without consuming additional storage in the process. This capability accelerates resource provisioning and enhances scalability. The administrator can specify whether new VMs should be powered on when the cloning process is completed, and, if so, whether they should all be powered on simultaneously or staggered. In addition, cloned VMs can be imported directly into VMware View Manager, where they can be managed as either individual VMs or VM pools.

Rapid, space-efficient virtual server and desktop redeployment
VMware administrators can use VSC to patch or update cloned VMs after the VMs are first deployed. When desktops or servers are deployed for the first time, VSC tracks and maintains the relationship between the update and the baseline template. Administrators can then redeploy clones directly from vCenter for one or all of the VMs that were originally created from the baseline template. Up to thousands of VMs can be redeployed with just a couple of clicks.

2. The capability to automatically shrink datastore size is available for NFS environments only.

VSC-based VM redeployment creates near-instantaneous clones of the cloned VMDK files without altering the VM configuration information. This capability leaves all VMware View entitlements and Microsoft Active Directory objects undisturbed.

VASA Provider

VASA Provider for the NetApp clustered Data ONTAP® operating system is an information pipeline between NetApp clustered Data ONTAP storage systems and vCenter server. This tool shares with vCenter information about storage and datastores—including storage configuration, health status, and capacity—allowing VM administrators to make more intelligent storage decisions. VASA is a separate download that integrates into VSC and introduces policy-based management to the VSC environment.

The simple-to-use interface is integrated into the VSC vSphere client and allows administrators to manage—create, edit, delete, clone, and map—storage-level objectives (called storage capability profiles in the VASA Provider). By allowing datastores to be associated with "matching" storage capability profiles, the VASA Provider enables VMware administrators to make more intelligent VM provisioning decisions by selecting the storage best suited to the VM's storage needs. The VASA Provider also monitors storage capability profile and datastore compliance, and it alerts the administrator when an out-of-compliance condition is detected so that he or she can take appropriate remedial action.

Virtual machine granular management

The capabilities of VSC with the integrated VASA Provider are expanded with the addition of VMware vSphere Virtual Volume support. In addition to storage capability profile management for both traditional and Virtual Volume datastores, the VASA Provider provides Virtual Volume management. Unlike traditional virtual disks, Virtual Volumes are dynamically provisioned by the VASA Provider as distinct storage entities on the storage system. Also, all Virtual Volume operations, such as snapshots, clones, and recovery, are off-loaded to the storage system. This approach results in enhanced efficiencies, new levels of automation and scalability, and simplified storage operations. It also provides VM granular storage services for both block and NFS. This feature enables each Virtual Volume to have its own distinct characterization that is independent of its container and precisely aligned with application requirements.

Nondisruptive VM Optimization and Migration

Misaligned VMs can adversely affect I/O performance, especially when they are heavily used. VSC scans datastores to determine which VMs are misaligned and performs an online I/O alignment by nondisruptively migrating the misaligned VMs to a datastore that is optimized for the VMs. I/O performance is improved by reducing overall I/O requirements with an optimized data layout.

Enabling Cloud Computing

By supporting NetApp MultiStore® (Data ONTAP operating in 7-Mode) and storage virtual machine (clustered Data ONTAP) technologies, VSC enables the provisioning and management of VMs in secure multi-tenant cloud environments. End customers, service providers, and cloud providers can securely administer partitions of shared application, compute, and storage resources from within the vCenter framework, maintaining desired service levels and security for each tenant.

System Requirements

NetApp Virtual Storage Console 6.0 requirements are:

- VMware ESX or ESXi 4.0 or later
- VMware vCenter Server 5.5 or later
- NetApp Data ONTAP:
  - 7.3.4 or later
  - 8.0 (Data ONTAP operating in 7-Mode) or later
  - 8.2 (clustered Data ONTAP or Data ONTAP operating in 7-Mode) or later

Protocols

- NFS, iSCSI, FC, or FCoE

Supported host operating systems

- Microsoft Windows Server (32-bit and 64-bit):
  - 2003 EE or R2EE
  - 2008 SE, EE, R2SE, or R2EE
  - 2012 R2

For the most current system requirements and free software download, visit the NetApp Virtual Storage Console for VMware vSphere Interoperability Matrix Tool.

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Leading organizations worldwide count on NetApp for software, systems and services to manage and store their data. Customers value our teamwork, expertise and passion for helping them succeed now and into the future.
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