VMware App Volumes User Guide

VMware App Volumes 2.9

This document supports the version of each product listed and supports all subsequent versions until the document is replaced by a new edition. To check for more recent editions of this document, see http://www.vmware.com/support/pubs

You can find the most up-to-date technical documentation on the VMware Web site at:
http://www.vmware.com/support

The VMware Web site also provides the latest product updates.

If you have comments about this documentation, submit your feedback to:
docfeedback@vmware.com

VMware, Inc.
3401 Hillview Ave.
Palo Alto, CA 94304
www.vmware.com

CONTENTS

About This User Guide

The *VMware App Volumes User Guide* provides information about how to deploy and configure VMware App Volumes infrastructure. This guide also provides guidance on creating, managing and deploying AppStacks to users managing user assignments, volume creation, storage and infrastructure with the VMware App Volumes Manager.

Intended Audience

This information is intended for VMware App Volumes administrators, virtual infrastructure administrators, and operations engineers who track and maintain the App Volumes infrastructure.

VMware Technical Publications Glossary

VMware Technical Publications provides a glossary of terms that might be unfamiliar to you. For definitions of terms as they are used in VMware technical documentation, go to http://www.vmware.com/support/pubs

Updated Information

The *VMware App Volumes User Guide* is updated with each release of the product or when necessary.

This table provides the update history of the *VMware App Volumes User Guide*.

Version	Description
VMware App Volumes 2.9	Added the following information: • Hypervisor Storage • VHD In-Guest Storage • Setting up the vCenter Server Machine Manager Connection • Adding Additional vCenter Servers • Override Precedence • Provisioning Best Practices • Limitations • Recommendations Updated the following information: • Hypervisor Connection Types • Installing the App Volumes Broker Service (Horizon View Only) • Batch Script Files • Best Practices
VMware App Volumes 2.7	Added the following information: • Trusted Domain Credentials • Active Directory Synchronization • Delete Unreachable AppStacks and Writable Volumes • Dynamic File Permissions • vCenter Direct-To-Host Mounting
VMware App Volumes 2.6 and VMware App Volumes 2.5	Initial Versions

Getting Started With VMware App Volumes

1

VMware App Volumes is a real-time application delivery system that enables enterprises to dynamically deliver and manage applications. App Volumes provides a seamless end-user experience while reducing infrastructure and management costs. Unlike traditional application management solutions, App Volumes provides a stateless desktop without compromising user experience.

In a virtual desktop environment, VMware App Volumes provides the following benefits:

Real-Time Application Delivery and Management

- Instantly provision applications at scale
- Dynamically attach applications to users, groups, or target computers, even when users are logged onto their desktop
- Provision, deliver, update, and retire applications in real time

App Volumes eases application management for administrators. No more packaging, modifying, or streaming applications. App Volumes allows administrators to dynamically deliver applications to end-users in seconds.

Agility

- Logically manage application sets based on business needs
- Deliver and integrate application sets across all virtual desktops in seconds

.

Simplicity

- Integrate into existing infrastructure in minutes
- Provision applications as easily as installing them

Flexibility

- Persistent user experience with non-persistent economics
- Works with VMware Horizon with View and Citrix XenApp

Efficiency

- Optimize the use of storage, SAN, IOPS, and network
- Reduce base image size and variations

VMware App Volumes Components

A typical VMware App Volumes environment consists of a few key components that interact with each other and external infrastructure.

AppStack Volume

This is a read-only volume containing one or more Windows applications. AppStacks are created by using the VMware App Volumes Manager and the Provisioning process. Once provisioned, an individual AppStack or multiple AppStacks can be mapped to a user, a group of users or computers at boot, login, or in real time.

Writable Volume

Optional read/write volume for persisting user-specific information between sessions. Writable volumes can be used to store the following:

- User installed applications and application settings
- Application licensing information
- User and computer profile
- Data files

Only one writable volume per user can be used at any given time, but users can have more than one writable volumes assigned to them.

App Volumes Manager

VMware App Volumes Manager is a core component that is installed on Windows Server and consists of services that orchestrate application delivery and interface with IT infrastructure.

It provides the following functionality:

- Orchestrates the required infrastructure components such as Storage, Active Directory, and Volume attachments.
- Manages assignments of volumes to users, groups, and target computers.
- Collects AppStacks and Writable volumes usage information.
- Maintains history of administrative actions.
- Acts as a broker for the App Volumes agents for automated assignment of applications and writable volumes during desktop startup and user login.
- Provides graphical user interface to create and manage the environment.

App Volumes Agent

A software component that is installed on computers running supported versions of Windows Server (for RDSH use cases) or Windows desktop operating systems where users receive AppStack and Writable Volume assignments. The agent runs as a service and utilizes a filter driver to handle application calls, and file system redirects to AppStack and writable volume VMDKs. Windows desktops do not have to be members of the domain on which the App Volumes Manager server resides when they are used for AppStack Provisioning.

App Volumes Manager Console

Web console for administration and configuration of App Volumes and assignment of AppStacks and Writable Volumes. Web Console is installed as a part of App Volumes Manager.

App Volumes Database

A Microsoft SQL Server database that contains configuration information for AppStacks, writable volumes, users, computers, entitlements, and transactions.

App Volumes Broker Integration Service

A service installed on a VMware Horizon with View Connection Server that enables faster user logins for users on VMware View desktops.

App Volumes User

Active Directory (AD) user account or organizational unit (OU) to which AppStacks and writable volumes are assigned.

Storage Group

Storage Groups are used to automatically replicate AppStacks and distribute Writable Volumes across many datastores.
They are also used to define a group of datastores that should all contain the same AppStacks (automatic replication). Some of the attributes for the group (such as template location and strategy) only apply when using the group for distributing writable volumes.

The distribution strategy setting controls how writable volumes are distributed across the group.

Spread: Distribute files evenly across all the storage locations. When a file is created, the storage with the most available space is selected.

Round-robin: Distribute files by sequentially using the storage locations. When a file is created, the storage with the oldest used time is selected.

Provisioning Computer

A computer that includes the operating system, any necessary updates and service packs, and has required core applications installed. This computer acts as a master device that is used to install new applications to the AppStack.
The provisioning computer must have the App Volumes agent installed and configured to connect to the App Volumes Manager.

Target Computer

A VDI desktop, physical client computer, Remote Desktop Services Host or Citrix XenApp Server where users are logging in to access their applications delivered from the AppStack.

The Target Computer must have the App Volumes agent installed and configured to connect to the App Volumes Manager.

App Volumes Operation Modes

- **VMDK Direct Attach Operation Mode** – This is the preferred operations mode for App Volumes. In this mode, AppStacks and Writable Volumes are stored within a hypervisor datastores in VMDK file format and attached to the virtual machine using standard hypervisor functionality.

- **VHD In-Guest Operation Mode** – In this operation mode AppStacks and Writable Volumes are stored on the standard Common Internet File System (CIFS) file share in VHD file format and attached to the Target Computer using Operating System functionality.

Hypervisor Connection Types

Operation modes are dependent on the hypervisor connection type. Currently, App Volumes supports three hypervisor connection types:

- **VMware vCenter Server** – This is a preferred connection type for mid-to-large environments. This connection type enables the use of VMDK Direct Attached operation mode**.** When using this connection type, you can assign AppStacks and Writable Volumes to the virtual machines running on multiple hypervisor hosts.
- **ESX (Single Host)** – This connection type also enables the use of VMDK Direct Attached Operation Mode, but it works only for a single hypervisor host. Use this connection type for small deployments and proof of concepts. When using this connection type, you can assign AppStacks and Writable Volumes to the virtual machines running on a single hypervisor host.
- **VHD In-Guest Services** – This connection type disables hypervisor connection and enables the use of VHD In-Guest operation mode**.** Use this connection type to assign AppStacks and Writable Volumes to the virtual machines running on third-party unsupported hypervisors or to the physical computers.

Note: After the hypervisor connection type is configured, and the operation mode is selected, it cannot be changed without a reinstall of the App Volumes Manager and clearing the App Volumes Database.

System Requirements

2

This topic describes the system requirements for installing the current version of VMware App Volumes. It does not cover system requirements for other infrastructure components (such as hosts, applications or SQL Server infrastructure).

Infrastructure

Requirement	Details
App Volumes Management Server	Microsoft Windows Server 2008 R2 Standard, Enterprise or Datacenter editions Windows Server 2012 R2 Standard and Datacenter editions .NET 3.5 framework 2 vCPU (4 vCPU Recommended) 4GB of RAM 1 GB of disk space
App Volumes Agent (client OS)	Microsoft Windows 7 Professional and Enterprise editions Microsoft Windows 8.1 Pro and Enterprise Both 64-bit and 32-bit versions are supported 1 GB of RAM 5 MB of disk space
App Volumes Agent (RDSH)	Microsoft Windows Server 2008 R2 Standard, Enterprise or Datacenter editions Windows Server 2012 R2 Standard and Datacenter editions 1 GB of RAM 5 MB of disk space
App Volumes Broker Integration Service	Microsoft Windows Server 2008 R2 Standard, Enterprise or Datacenter editions Windows Server 2012 R2 Standard and Datacenter editions .NET 3.5 framework 2 vCPU 4 GB of RAM 1 GB of disk space
VMware Software for VMDK Direct Attached Mode (Preferred)	VMware ESX 5.0, 5.1.x, 5.5.x, 6.x and vCenter (ESX and vCenter) must be the same version
	Horizon with View 6.0.1 or later.
CIFS file share if using VHD mode	SMB Version 3.02 (Windows Server 2012 R2) is recommended for a better performance
Active Directory	Microsoft Active Directory Domain, Windows Server 2003 functional level or later

Database

App Volumes Manager supports the following Microsoft SQL Server versions:

- SQL Server 2012 SP1, Express, Standard, and Enterprise Editions. By default, SQL Server
- SQL Server 2008 R2 SP2, Express, Standard, Enterprise, and Datacenter Editions

For high availability, following database features are supported by App Volumes (If supported by installed SQL Server edition):

- SQL Server Clustered Instances
- SQL Server Mirroring

Both Windows Integrated and SQL authentication are supported by App Volumes Manager.

Networking

Component	Purpose	Port Number
App Volumes Manager	Agent/Manager Communications	TCP 80 (HTTP) TCP 443 (HTTPS) TCP 5985 PowerShell Web Services TCP 5986Horizon View Broker integration service.
App Volumes SQL Database	Database communication	TCP 1433 (SQL)

Browser

To manage App Volumes using App Volumes Manager Console you need to use one of the supported browsers:

- Internet Explorer 9 or higher
- Firefox 28 or higher
- Safari 5.1 or higher
- Google Chrome 21 or higher

User Accounts

Local administrator privileges are required to install App Volumes components on target servers.
If you plan to use Writable Volumes in combination with User Installed Applications, the end-users must have local administrator privileges on Target Computers to install such applications.
AppStack provisioning process requires the provisioning user to have local administrator privileges on the provisioning computer.

To integrate App Volumes with vCenter, you need to create a service account within a vCenter with Administrator privileges. Optionally, you can create a service account with privileges granted by a custom user role as defined in the vCenter Custom Role.

If you plan to use direct connection to ESX host or plan to use Mount on Host option with vCenter connection, you need to have a credentials of the user account that have administrative privileges on all ESX hosts.

Note: User names must contain only ASCII characters.

Active Directory Credentials

The App Volumes Manager connects to the Active Directory using the service account. To prepare for installation you must create an account within the Active Directory domain that meets the following requirements:

- Provides read access to the Active Directory domain.
  Note: Administrator privileges are NOT required and NOT recommended
- Password for the service account does not expire.

The App Volumes Manager fully support trusted Active Directory domains if they are configured for two-way trust. If your environment contain domains that configured for one-way trust and which doesn't trust the primary App Volumes domain, you can configure separate credentials to access these domains.

These credentials are used when connecting to any trust instead of the primary domains credentials.

App Volumes Administrators Group

Access to the App Volumes Manager is restricted to members of the App Volumes Administrators Group. When you perform the initial configuration, you need to provide the name of the Active Directory security group that will have access to the App Volumes Manager.

The Active Directory service account user is not required to be in the administrator group.

Installing and Configuring VMware App Volumes 3

You prepare for VMware App Volumes Manager installation by evaluating your environment and following the appropriate pre-installation procedures. This chapter discusses installation guidelines, some critical initial configuration, and procedures for installing and configuring VMware App Volumes.

Installation Guidelines

To build a new App Volumes deployment, follow the guidelines given below:

1. Ensure that the environment meet the system requirements.
2. Prepare SQL Server for App Volumes Database.
3. Install App Volumes Manager.
4. Install App Volumes Agent on the Provisioning computer and target desktops.
5. If you plan integration with VMware Horizon View, install App Volumes Broker.
6. Within Active Directory, create a security group that will be used as an App Volumes administrator group.
7. Depending on App Volumes Operation Mode, configure the storage.
8. Perform initial configuration of App Volumes Manager.
9. Create and Provision a new AppStack.
10. Assign AppStack to users or Target Computers.

Configure The App Volumes Database

Before installing App Volumes Manager for the first time, you need to create a new empty database on the SQL Server.

To use Windows Integrated authentication, grant db_owner permissions on the new database to the computer account of the App Volumes Manager server.

To use SQL Authentication, create a new user and grant it db_owner permissions on the new database.

Install The App Volumes Manager

This section describes the installation of the VMware App Volumes Manager.
Ensure that your environment meets system requirements and that your account has local administrator privileges on the target server.

Procedure:

1. Start the installation by running the setup.exe installer found in the Installation folder on the App Volumes installation media.
2. Read and accept the End User License Agreement.
3. Select the **Install VMware App Volumes Manager** option.

4. Select the database option, use the remote dataInstabase (recommended) or local installation of SQL Server Express. When SQL Server Express is selected, it will be installed automatically.
5. On the database configuration screen, select the server and database created in App Volumes Database Configuration section, a new system ODBC connection named svmanager will be created automatically.

   Important: Ensure that the **Overwrite existing database** check box is clear when you upgrade App Volumes or install an additional Manager Server.

6. Select on which ports App Volumes Manager will listen for incoming connections (default values: HTTP:80, HTTPS:443) and complete the installation.

Install The App Volumes Agent

This section describes the installation and initial configuration of the VMware App Volumes agent.
Note: App Volumes Agent must not be installed on the server where App Volumes Manager is installed.

Ensure that your environment meets system requirements and that your account has local administrator privileges on the target computer.

Procedure:

1. Start the installation by running the setup.exe installer found in Installation folder on the App Volumes installation media.
2. Read and accept the End User License Agreement.
3. Select the **Install VMware App Volumes Agent** option.
4. Enter the VMware App Volumes Manager host name or IP address and port.
5. Complete the installation and restart the computer after installation.

Note: If you intend to use this virtual machine as a Provisioning Computer, create a clean snapshot or backup of this machine. Revert to this snapshot or backup before provisioning new AppStacks.

Install The App Volumes Broker Service (Horizon View Only)

This section describes the installation of the optional VMware App Volumes Broker Service.
Ensure that your environment meets system requirements and that your account has local administrator privileges on the target server.

App Volumes Broker must be installed on the server that hosts VMware Horizon with View Connection server.

Procedure:

1. Start the installation by running the setup.exe installer found in Installation folder on the App Volumes installation media.
2. Read and accept the End User License Agreement
3. Select the **Install VMware App Volumes Broker** option.

4. Enter the VMware App Volumes Manager host name or IP address and port and complete the installation.

Configure The App Volumes Storage

There are two types of App Volumes Storage configuration that you can perform. Ensure the appropriate storage option is configured before proceeding with App Volumes Manager configuration.

Hypervisor Storage

When using VMDK Direct Attach Operation Mode, the App Volumes Manager requires local or shared storage to be configured on the hypervisor.

VHD In-Guest Storage

To use App Volumes with VHD In-Guest Operation Mode, the App Volumes Manager, and Agent computers require the special permissions on the CIFS file share to perform certain tasks on VHDs during the normal operation of App Volumes.

Procedure:

1. On a file server create a new empty folder.
2. Copy the contents of the **Hypervisor\In-Guest VHD** folder from the App Volumes Installation media to the new folder.
3. Share the folder and grant full access permissions on the file share to everyone.
4. Configure NTFS permissions as described below.

An Active Directory domain groups may be used to manage permissions for the following roles:

- **Managers**: App Volumes Managers
- **Agents**: Machines that receive App Volume and writable volume assignments
- **Capture Agents**: Machines used for provisioning new App Volumes

The following table describes the minimum NTFS folder permissions required for each role:

Folder	Managers	Agents	Capture Agents
apps	FULL	READ	WRITE
apps_templates	READ	NONE	NONE
writable	FULL	WRITE or NONE **Note**: WRITE permissions are required by Agents when Dynamic Permissions are not enabled.	NONE
writable_templates	READ	NONE	NONE

App Volumes Manager Initial Configuration

After initial installation of App Volumes components, App Volumes Manager needs to be configured.

Procedure:

1. Start the supported Internet browser and browse to the address of App Volumes Manager Server. **Welcome to App Volumes Manager** setup wizard will be displayed.
2. Click **Get Started** to proceed with the configuration.

Install The License Information

By default, App Volumes manager comes with an evaluation license that allows you to explore App Volumes product in a small scale lab environment.

The evaluation license has the following limitations:

- Maximum number of users:10
- Maximum number of attachments per user: 2
- Expiration in: 255 days

For production deployments, you need to install the license file that can be downloaded from the MyVMware.com portal**.**

Configure The Active Directory

App Volumes uses Active Directory to assign applications to users, computers, groups, and OUs.

Enter the following information on the Active Directory configuration screen.

Parameter	Description
Active Directory Domain Name (required)	A fully qualified domain name of the Active Directory domain where users and target computers are residing Example: corp.vmware.com
Domain Controller Host Name (optional)	By default, App Volumes Manager automatically discovers the closest Active Directory Domain Controller, if you want to enforce connection to the particular server. You can configure the fully qualified domain name of the domain controller in this option. Example: dc01.corp.vmware.com
LDAP Base (optional)	By default, App Volumes Manager enumerates all user, group, OU and computer objects within Active Directory. If you want to limit the scope of such enumeration, provide the distinguished name of the Active Directory container or organizational unit that stores required entities. Example: OU=Engineering, DC=corp, DC=vmware, DC=com

Parameter	Description
Username (required)	The username of the service account that has a read-only access to the target Active Directory domain. Example: svc-appvolumes
Password (required)	Password for the service account. Make sure that domain policies do not enforce password expiration for the service account.
Use secure connection (port 636) (optional)	If your domain controllers are configured for with TLS certificates for LDAP connections, you can enable this option to ensure that communication with the domain controller is encrypted.
Allow non-domain entities (optional)	If this option is enabled, App Volumes Manager will allow AppStack assignments for non-domain users and computers.
Trusts Username (optional)	The username of the service account that has a read-only access to the Active Directory domain configured for one-way trust. Example: svc-appvolumes
Trust Password (optional)	Password for the service account. Make sure that domain policies do not enforce password expiration for the service account.
Trust Domains (optional)	A list of domains to use the new trust credentials can be provided. Instead of using the credentials on all trusted domains, they are only used in the specified domains. Spaces should separate the list. *Example: domain2.local domain3.com.* If the domain controller cannot be automatically detected from DNS, you can add that to a domain in the list using a semi-colon. Example: domain2.local;10.0.0.1 domain3.com;ldap.domain3.com.

Set Up The App Volumes Administrators Group

On the Active Directory Configuration screen, select the Active Directory group that will act as App Volumes Administrators Group. Only users in this group will be able to login to the App Volumes Manager.

Configure a Machine Manager

There are three modes for the App Volumes Manager:

- vCenter Server
- ESX Single Host
- VHD In-Guest Services.

The App Volumes operation mode is determined by configuring a machine manager. Once a machine manager has been configured, this mode cannot be changed. However, if vCenter server was selected as the first configured machine manager, additional vCenters may be added and configured.

Set Up The vCenter Server Machine Manager Connection

Enter the following information into the vCenter server connection.

Parameter	Description
Host Name (required)	A fully qualified name of the server that hosts VMware vCenter Example: vc01.corp.vmware.com
Username (required)	The username of the service account that has administrative privileges within a vCenter. Example: CORP\svc-appvolumes
Password (required)	Password for the service account. Make sure that domain policies do not enforce password expiration for the service account.
Mount local copies of volumes (optional)	When enabled, App Volumes Manager will check the datastore where the virtual machine is residing for local copies of AppStacks and Writable Volumes. If present, those local copies will be mounted. If this option is disabled, or no local copies found, AppStacks and Writable Volumes will be mounted at the default location.
Issue mount operations to hosts (optional)	When enabled, App Volumes Manager will connect directly to the ESX host to issue a volume mount command. This could increases performance because commands are not queued in vCenter. If this option is disabled, App Volumes manager will issue such commands indirectly via vCenter SDK.
ESX Username (optional)	The username of the service account that has administrative privileges within all ESX hosts. When the Issue Mount Operations to Hosts option is enabled, App Volumes Manager uses these credentials for direct connections to ESX hosts. Example: CORP\svc-appvolumes
ESX Password (optional)	Password for the service account. Make sure that domain policies do not enforce password expiration for the service account

Adding additional vCenter Servers

Additional Machine Managers may be added at any time if vCenter server was selected as the first configured machine manager. Configured storage references will include storage from all Machine

Managers. Shared datastores might appear more than once depending on the number of vCenters configured.

Set Up The ESX (Single host) Machine Manager Connection

The following information must be entered for the ESX (Single Host) connection.

Parameter	Description
Host Name (required)	A fully qualified name of the ESX host. Example: esx01.corp.vmware.com
Username (required)	The username of the service account that has administrative privileges on the ESX host. Example: CORP\svc-appvolumes
Password (required)	Password for the service account. Make sure that domain policies do not enforce password expiration for the service account

Verify VHD In-Guest Services Machine Manager Connection

VHD In-Guest services does not require credentials to be configured.

Parameter	Description
Dynamic Permissions	This option when selected will manage the permissions for writable volumes. Prior to instructing the agent to mount the volume for read-write access, WRITE permissions for the volume will be granted.

Configure Storage

On this screen, specify the default storage location and default paths for AppStacks and writable volumes.

Important: Use storage that is accessible to all virtual machine host servers. Local host storage may be used, but volumes will only be attached for virtual machines on that host.

Configure The Default Storage Location And Default Paths For Appstacks And Writable Volumes

App Volumes has a new interface for managing VHD file shares. Administrators can now enter the path to browse shared files in a UNC. Alerts and warning messages might also appear to assist the administrators, and they can easily view file share permissions.

Note: The button to add available storage is only available when the App Volumes Manager is configured to use In-Guest VHD mode. Otherwise, the list of storage locations (datastores) is populated from vCenter.

Upgrading VMware App Volumes 4

This section describes how to upgrade the VMware App Volumes Manager.

Upgrade The VMware App Volumes Manager

To upgrade App Volumes Manager to the new version follow the procedure described below.

Procedure:

1. Schedule a maintenance window to ensure that users will not experience a service degradation.
2. Using the **ODBC Data Sources** applet in the Control Panel, note the database and server name defined in the system ODBC source **svmanager.**
3. Create a backup of the App Volumes database using SQL Server tools.
4. Create a full server backup or snapshot of the App Volumes Manager server.
5. Using Programs and Features applet in the Control Panel, uninstall the previous version of the App Volumes.
6. Install a new version of the App Volumes Manager. Specify the Database server and name. **Note**: Ensure that the **Overwrite existing database** checkbox is clear.
7. Verify the installation by connecting to the App Volumes Management console.

Upgrade The VMware App Volumes Templates

After you upgrade the App Volumes Manager, make sure that you update the AppStack templates. You can perform this task by following the procedure below.

Procedure:

1. Navigate to the **Configuration** tab and open **Storage** sub-tab using the App Volumes anager console.
2. Click on **Upload Prepackaged Volumes.**
3. Select the datastore, host and provide host credentials.
4. Select all available templates.
5. Click **Upload.**

Upgrading The VMware App Volumes Agent

To upgrade App Volumes Agent to the new version follow the procedure described below.

Procedure:

1. Schedule a maintenance window to ensure that users will not experience a service degradation.

2. Unassingn all AppStacks and writable volumes from the target computer that you plan to upgrade.
3. Login with the user account that doesn't have any AppStacks and writable volumes assigned.
4. Uninstall the previous version of the App Volumes Agent using Programs and Features applet in the Control Panel.
5. Install a new version of the App Volumes Agent.

Note: Ensure that the App Volumes Manager is updated.

Upgrading The VMware App Volumes Broker

To upgrade App Volumes Broker to the new version follow the procedure described below:

Procedure:

1. Schedule a maintenance window to ensure that users will not experience a service degradation.
2. Uninstall the previous version of the App Volumes Broker using Programs and Features applet in the Control Panel.
3. Install a new version of the App Volumes Broker.

Managing VMware App Volumes 5

You can use App Volumes Manager Console for day-to-day management of App Volumes infrastructure. This section of the document provide guidelines for performing everyday tasks.

App Volumes Manager Console

This topic provides an overview of the App Volumes Manager console.

Dashboard

The dashboard displays the following information:

- The number of user and server licenses in use
- User utilization
- Most recent user logins
- Computer utilization
- Most recent computer logins
- AppStack utilization
- Most recent AppStack attachments

Volumes

The Volumes tab is used to create and manage AppStacks and Writable Volume and for monitoring currently attached volumes.

Directory

The Directory tab display the information about users, computers, groups and OUs that have assignments or were logged in to the computer that has the App Volumes Agent installed.

Active Directory objects are automatically synchronized with App Volumes database every 4 hours. To force synchronization, use the **Sync** button within the Directory tab.

Infrastructure

The Infrastructure tab displays the information about computers and storages seen by the App Volumes Manager.

This tab also provides information about configured storage groups and allows you to configure new Storage Groups.

Activity

The Activity tab has three sub-tabs that can help with monitoring App Volumes Infrastructure:

- **Pending Actions Sub-Tab:** Displays actions waiting to be performed in the background and will be completed in the order submitted.

- **Activity Log Sub-Tab:** Displays records of system activity such as user logins, computer power-ups, volume attachments, and so forth.
- **System Messages Sub-Tab:** Displays messages and errors generated by internal events such as volume attachment, Active Directory access, and so forth.

Configuration

You can change the settings specified during App Volumes Manager configuration. There are five sub-tabs:

- **License Sub-Tab**: Contains information on the license. A valid license issued by VMware App Volumes is required to use this management console.
- **Active Directory Sub-Tab:** Provides information about your active directory. VMware App Volumes uses the Active Directory to assign AppStacks to users, computers, and groups.
- **Administrators Sub-Tab:** Enables the choice of the Active Directory group responsible for administering the VMware App Volumes Manager.
- **Hypervisor Sub-Tab:** Enables you to specify the login credentials to the VMware vCenter.
- **Storage Sub-Tab:** Enables you to set the default database where AppStacks and writable volumes are stored.

Working With AppStacks 6

This section describes how to create AppStacks, provision applications, assign AppStacks and create writable volumes.

Important: The provisioning of AppStacks must be performed on a clean base image, a virtual machine that resembles as closely as possible the target environment to which you later plan to deploy the AppStack. For example, the provisioning virtual machine and target should be at the same patch and service pack level and. If applications are included in the base image, they should also be in the provisioning virtual machine.

Provisioning should be done on a virtual machine that did not have any AppStacks previously assigned to it. If there were any AppStacks assigned to the virtual machine, or the virtual machine has been used for provisioning before, that virtual machine should be set back to a clean snapshot before provisioning a new AppStack.

Create An AppStack

If the VMware App Volumes Manager is not open already, follow the procedure given below

Procedure:

1. From the Windows Start menu, select VMware App Volumes Manager.
2. Navigate to the Manager's IP address or hostname, or click on the desktop icon.

   Note: ThinApp users need to go to **Delivering ThinApp Packages**.

To create an AppStack, follow the procedure given below.

Procedure:

1. On the VMware App Volumes Manager page, select the **Volumes** tab.
2. If you are not on the AppStacks page, select the **AppStack** sub tab.
3. Click **Create AppStack**.
4. Enter a name for the AppStack.
5. The storage field is populated with the name of your default datastore. Use the drop-down list to select a different datastore.
6. Set the path for the volume.
   The Path (the path to the apps_templates and writable_templates file on the datastore) is created during the initial setup process. Users can change the path to further sub-categorize volumes.
   For Example: cloudvolumes/apps/your_folder
7. Select a template for the AppStack.
8. Provide a description if required, and click **Create**.
9. If you want to have the volume created in the background or immediately, verify the data and click **Create** again.

Provision An AppStack

After a new AppStack is created, you need to provision by attaching it to the provisioning computer and installing the application you need.

Procedure:

1. From the AppStack sub-tab of the Volumes tab within the App Volumes Manager console, select the AppStack you have created.
   The row expands and the Provision and Delete buttons are displayed.
   Note: Ensure that the AppStack's status is un-provisioned, indicating that the provisioning process is not yet complete.
2. Click **Provision**.
3. Search for the provisioning computer by entering a full or partial name of the computer. If you leave the search field empty, all computer objects will be returned.
4. Select the correct provisioning computer from the list.
5. Click **Provision**.
   Note: For VHD In-Guest Mounting, it is required that the Provisioning Computer is powered off.

Install Applications

After a new AppStack is attached to the Provisioning Computer, you need to install Application and finish provisioning process.

Procedure:

1. Log on to the Provisioning computer.
   Note: Ensure that the pop-up window displays information that you are now in the provisioning mode.
2. Install your applications.
   Warning: Do not click OK until you have fully completed the software installation of all your applications. If you click OK before installation is finished for the first application, the AppStack will be created; however, it will be empty. If you click OK before you have finished installing all of the applications you want in the AppStack, the AppStack will contain only the applications you have completed installing.
3. Click **OK**.
   The system will reboot.
4. Log on to the Provisioning Computer.
5. When provisioning has succeeded, click **OK**.
6. Return to the VMware App Volumes Manager, Click **Complete**.
7. Confirm Provisioning.

Edit An AppStack

When an AppStack is provisioned, it will automatically be associated to the operating system type it was provisioned on. It will only be attached to that exact same OS type unless otherwise specified.

An administrator can go to the Edit AppStacks section to change the OS that each AppStack might be attached on.

Update An AppStack

The VMware App Volumes update feature makes a copy of an existing AppStack, and allows you to add more applications, update current applications, or make any other changes to the newly copied AppStack. The original AppStack still exists and is unaffected by the changes to the copy.

Procedure:

1. If the VMware App Volumes Manager is not open already, go to the Windows Start menu and **select** VMware App Volumes Manager or **click** on the desktop icon or navigate to the Manager host name.
2. On the VMware App Volumes Manager page, **click** on the Volumes tab.
   Existing AppStacks are shown. Find an AppStack to be updated and click on the (+) icon or anywhere in the row to view AppStack details and expose the **Update** button
3. Click **Update**.
4. Type a name for the AppStack copy and provide a description of the AppStack (optional).
   The Datastore field is populated with the name of your default datastore. The path is created during the initial setup process.
5. Click **Create** to confirm Update AppStack via Pop-up then click **Update**.
   When the process is complete, the main page of the AppStacks is displayed.
6. Find the AppStack and click on the (**+) or (-)** located on the left side of the row and **Click anywhere** on the row.
   The row expands and the **Provision** and **Delete** buttons are revealed.
   Note: The AppStack's status is un-provisioned, indicating that the provisioning process is not yet complete.
7. Click **Provision** and then click on a row to select the agent where to install the AppStack.
   The row selected is highlighted. For In-guest VHD, it is recommended that the provisioning computer be in the Powered Off state prior to provisioning.
8. Click **Provision**, and then click **Start Provisioning**.
   The provisioning process is the same as it is for Create AppStack.
9. Select the agent and install applications on the agent, then click **OK**.
   After the provisioning process is complete, a success pop-up massage displays.
10. In the VMware App Volumes Manager, click **Complete**.

    You can now assign this AppStack to users, computers, or groups.

    Important: Un-assign the original AppStack before you assign the updated AppStack.

Assign An AppStack

After AppStack is created and fully provisioned, it can be assigned to users, groups or computers. Once assigned, the AppStack, the application will deploy within seconds in real time or next login.

Procedure:

1. From the AppStack sub-tab of the Volumes tab within App Volumes Manager console, select the AppStack you want to update. The row expands and the **Assign** button is displayed.
2. Click **Assign**.
3. Type a search string to find the name of the entity to assign the AppStack.
4. (Optional) Select Search all domains in the Active Directory forest check box.
   Note: User Principal Name string searches (search_term@domain.local) and Down-Level Logon Name string searches (domain\search_string) are supported.
5. Click **Search.**
   The software finds the name of the entity to assign the AppStack. The user can limit the assignment to a particular computer. This is done by entering a prefix for the computer name(s) to match. For example, enter Win7- to match any computer with a name that begins that with Win7, such as Win7-64-Steve.
6. Select the user, group, or the computer, and click **Assign**.
   If you choose to attach the AppStack immediately, all computers the selected users are logged into will have the volume attached. If a group, or OU, all users/computers in those groups will get the attachments immediately. There are two options:
   - Attach AppStack on next login or reboot
   - Attach AppStack immediately
7. Select and click **Assign**.
   After AppStack is assigned to the entity, this entity becomes known to App Volumes, and you can use **Directory** tab to manage assignments to Users, Computers or Groups.

Override Precedence

When multiple AppStacks that share common components are assigned, you can reorder AppStacks to prioritize specific a AppStack and the applications contained in it.
As an example, the user could have both Adobe 9 and Adobe 10.x AppStack attached, although Adobe 9 and Adobe 10.x cannot co-exist natively. VMware App Volumes makes this possible. When users double-click a PDF file on the desktop, only one Adobe Reader will be launched. If Adobe 9 was on top of Adobe 10.x in the Assigned AppStacks list, Adobe 9 would get the priority so it will be the default PDF reader application. If the user wants to modify this, the reordering feature will allow customers to adjust the stack order so Adobe 10.x can be default PDF reader to use.

Use the **Override Precedence** check box on directory or users, or directory or computers tab, then the arrow icons display on the left side of AppStacks, to show that the AppStack can be reordered. Drag and Drop the AppStack to change the order of each AppStack.

If the AppStack is greyed out, this AppStack cannot be reordered. It could be that this AppStack was a group assignment which need to be a fix order.

Note: AppStacks provisioned with VMware App Volumes v2.5 or later are able to be reordered.

Importing AppStacks

If you have preconfigured third-party AppStacks or AppStacks from another deployment, you can import them to App Volumes.

Procedure:

1. Create a new folder on selected datastore and upload AppStack .vmdk files to this folder using a vCenter datastore browser.
2. On the AppStack sub-tab of the Volumes tab within App Volumes Manager console, click **Import AppStacks.**
3. Select the datastore and path and click **Import.**

Rescan AppStacks

To update AppStacks information from the datastore, click **Rescan**. Rescan exists to ensure the writable volume files on the datastore are still present and accessible. It only checks known volumes. If new writables have been added to the datastore from a different manager, use the **Import** option have this information on this manager.

Delete AppStacks

Legacy and deprecated AppStacks could be removed from the disk and inventory when needed.

Procedure:

1. Unassign the AppStack from all entities.
2. From the AppStack sub-tab of the Volumes tab within App Volumes Manager console, select the AppStack you want to update. The row expands and the **Delete** button is displayed.
3. Click **Delete**.
   Note: AppStacks and Writable Volumes that can no longer be contacted on a datastore have their state set to Unreachable. You can now remove AppStacks or Writable Volumes even when they are Unreachable. This action will clean up the metadata in App Volumes Database.

Working With Writable Volumes 7

You can create writable volumes for computers, reassign them to other computers and users.

Create A Writable Volume

You can create writable volumes for your computer and users.

Procedure:

1. On the VMware App Volumes Manager page, select the **Volumes** tab.
2. Select **Writables** sub-tab.
3. Click **Create Writable**.
4. Type a search string to find the name of the entity to assign the Writable Volume.
5. (Optional) Select the **Search all domains in the Active Directory forest** checkbox. **Note**: User Principal Name string searches (search_term@domain.local) and Down-Level Logon Name string searches (domain\search_string) are supported.
6. Click **Search**.
7. To specify the location of writable volumes, select **Destination Storage** and **Destination Path.**
8. Choose the template for the new Writable Volume.
9. Configure advanced options for the Writable Volume.

Option	Description
Prevent user login if the writable is in use on another computer	For a writable volume to work as expected, ensure that users do not log into a computer without their writable volume attached because a user's local profile can interfere with their profile on the writable volume. To avoid confusion, the App Volumes Manager prevents a user from logging into an additional computer when their writable volume is attached elsewhere. Whether or not user login is blocked can be toggled via the **Block Login** option on each writable volume. This feature is best used to protect users from logging into persistent desktops without their writable volume. It is not needed when using non-persistent pools since the computer is reverted to a clean snapshot before use.

Option	Description
Limit the attachment of user writables to specific computers	Users may not need their writable volume on all the computers they use. Additionally, some users may need separate writable volumes that are only attached to specific computers. The **Limit Attachment** option enables you to specify the prefix to a computer name. When provided, the writable volume will only be attached to a computer with a name that begins with the prefix. For example, consider a user having two writable volumes, one limited to Win7-Dev and another limited to Win7-Test. When the user logs in to the computer named Win7-Dev-021, the user gets the first volume. When the user logs into Win7-Testing, the user gets the second volume. If the user logs into Win2012R2, no writable volume is attached.
Delay writable creation for group/OU members until they login	When you select a Group or Organization Unit, a writable volume will be created for each one of the current members. Often these containers can have hundreds or thousands of members. This can be problematic because creating a large number of volumes at once can take a long time. Each and every member may not need a writable volume either. The **Defer Create** option will defer the creation of writables for Group and OU members until their next login. This option only affects Groups and Organization Units. Users and Computer entities directly chosen will still have their volumes created immediately.

10. Click **Create**.
    Note: If you select a group, then individual writable volumes are be created for each member of that group. This can be delayed until the first time they login by using the delay checkbox.
    Group membership is discovered with recursion, meaning that users/computers in sub-groups will also receive volumes. However, when creating writables for Organization Units, groups are not recursed.

Import Writable Volumes

If you have Writable Volumes from another deployment, you can import them to the App Volumes.

Procedure:

1. Using vCenter datastore browser, create a new folder on selected datastore and upload Writable Volume. vmdk files to this folder.
2. On the **Writables** sub-tab of the Volumes tab within App Volumes Manager console, click **Import Writables**
3. Select the datastore and path and click **Import.**

Update Writable Volumes

Updating a writable volume allows an administrator to create a .zip package of files that will be created/updated in each writable volume when it is next attached. The zip file must be smaller than 5 Mb. The files are placed in the root of the writeable volume.

Procedure:

1. On the **Writables** sub-tab of the Volumes tab within App Volumes Manager console, click **Update Writables**
2. Browse and select required zip file.
3. Click **Upload.**
   Note: Once writable volumes are updated, the updates cannot be reversed. To make changes, use an additional update to overwrite the files.

Rescan Writable Volumes

To update Writable Volumes information from the datastore, click **Rescan**. Rescan exists to ensure the writable volume files on the datastore are still present and accessible. It only checks known volumes. If new writables have been added to the datastore (from a different manager), use **Import** to make this manager aware of them.

Manual Active Directory Synchronization

The App Volumes Manager maintains a database record for any Active Directory seen by an Agent or assigned to an AppStack or a Writable Volume. A background job runs every hour to synchronize up to 1000 entities. If you have more than 1000 items, then a new batch of 1000 will be synchronized the next hour.

The synchronization activity mainly updates information readable by humans such as Name. It also checks if the entry is in enabled or disabled state.

You can perform manual synchronization in two ways:

- Use the Sync button on the Detail View page for an individual or a computer.

- Use the Sync button on the Users or Computers Index pages.

You can use these buttons to schedule a background job to synchronize every user or computer in the App Volumes Manager database.

Advanced VMWare App Volumes Manager Configuration 8

You can configure VMware App Volumes by selecting configuration options such as the batch script files called at various points during system startup and logon, registry options for services, drivers, and other parameters.

Batch Script Files

App Volumes Agent executes batch script files when an AppStack or a Writable volume is dynamically attached or at various points during system startup and logon. If the attached volume does not contain some or all of the scripts, these non-existing scripts are ignored.

These scripts can, in essence, contain any scriptable action. The use for each is to be able to script an action at various points during the volume attach and virtualization procedure.
Some of the scripts are executed with the SYSTEM privileges and should be modified and added with caution.

Note: Script file names are case-sensitive.

Timeouts

When executing batch files, App Volumes manager can be configured to wait for a script completion before processing to the next step. Wait times are defined in seconds and can be configured by creating a corresponding registry value of REG_DWORD type under the following registry key:
`HKLM\SYSTEM\CurrentControlSet\services\svservice\Parameters`

Script name	Execution condition	Security context	Wait time parameter
prestartup.bat	Called when a volume is dynamically attached or on during system startup but before virtualization is activated	SYSTEM account	WaitPrestartup (default do not wait)
startup.bat	Called when a volume is dynamically attached or on during system startup	SYSTEM account	WaitStartup (default do not wait)
startup_postsvc.bat	Called as and called after services have been started on the volume (not called if there are no services on volume)	SYSTEM account	WaitStartupPostSvc (default do not wait)
logon.bat	Called at logon and before Windows Explorer starts	User account	WaitLogon (default wait until it finishes)

Script name	Execution condition	Security context	Wait time parameter
logon_postsvc.bat	Called after services have been started (not called if there are no services on volume)	User account	WaitLogonPostsvc (default do not wait)
shellstart.bat	Called when a volume is dynamically attached or when Windows Explorer starts.	User account	WaitShellstart (default do not wait)
shellstop.bat	Called when the user is logging off before Windows Explorer is terminated.	User account	WaitShellstop (default do not wait)
logoff.bat	Called at logoff and Windows Explorer has terminated	User account	WaitLogoff (default do not wait)
shutdown_presvc.bat	Called when the computer is being shutdown before services have been stopped.	SYSTEM account	WaitShutdownPresvc (default do not wait)
shutdown.bat	Called when the computer is being shutdown after services have been stopped.	SYSTEM account	WaitShutdown (default do not wait)
allvolattached.bat	Called after all volumes have been processed (so if user has 3 AppStack, this will be called after all 3 have loaded)	User account	WaitAllvolattached (default do not wait)
post_prov.bat	Called at the end of provisioning to do any one-time steps that should be performed at the end of provisioning. Invoked at the point of clicking the provisioning complete pop-up while the volume is still virtualized.	SYSTEM account	WaitPostProv (default wait forever)

Script name	Execution condition	Security context	Wait time parameter
prov_p2.bat	Invoked at phase 2 of the provisioning process. After the machine has rebooted but before App Volumes Manager has been notified that provisioning has completed. This is the last chance to perform any actions on the provisioned volume with virtualization disabled.	SYSTEM account	WaitProvP2 (default wait forever)

VMware App Volumes Agent Advanced Configuration

The VMware App Volumes Agent comprises two major components:

- SVdriver is responsible for the virtualization of volumes into the OS.
- SVservice is responsible for how the virtualization and volumes are controlled and communication with the App Volumes Manager.

Both components can be configured by configuring registry values defined in the table.

SVdriver Configuration Parameters

Registry keys and optional values are set in the following registry key path:

`HKLM\SYSTEM\CurrentControlSet\services\svdriver\Parameters`

Value	Type	Description
LogFileSizeInKB	REG_DWORD	The size of the log file before rotating the log file. If undefined, the default is 51200 (50MB).
ReorderTimeOutInSeconds	REG_DWORD	Defined in seconds, how long to wait for all volumes to be attached and processed based on Order Precedence set from within VMware App Volumes manager
MinimizeReplication	REG_DWORD	If this value is 1, only changes to data will be preserved in a writable volume. If this value is 0 changes to data and file attributes (hidden, Read Only, etc.) permissions will be preserved in Writable Volume.

Value	Type	Description
EnableShortFileName	REG_DWORD	For legacy AppStacks created prior to 2.3 this setting should be set to 0 to disable DOS short names
EnableRegValueMerging	REG_DWORD	If this value is 1, merge certain registry values such as AppInitDlls across volumes. This is action is additive across the volumes
DriveLetterSettings	REG_DWORD	To remove, hide or show drive letters for AppStacks and Writable volumes See the DriveLetterSettings topic below

DriveLetterSettings

App Volumes Agent interact with mapped volumes using system path to the volume without mapping it to a drive letter. Most of the modern applications are entirely compatible with this behavior. However, some of the applications might require a drive letter to access program or application files. To support this scenario, while maintaining the familiar user interface, AppVolumes can hide the drive from Windows Explorer after it is mapped.

This behavior is configurable using **DriveLetterSettings** registry value.

The value for **DriveLetterSettings** is in a hexadecimal format, and any number of flags might be combined to implement multiple parameters. For example, if you want to use the 0x00000001 and 0x00000008 flags as shown, the result is 0x00000009. Enter this as 9 because you only work with the significant digits.

Value	Description
0x0000001	DRIVELETTER_REMOVE_WRITABLE – do not assign drive letter for writable volumes
0x0000002	DRIVELETTER_REMOVE_READONLY - do not assign drive letter for AppStack volumes
0x0000004	DRIVELETTER_HIDE_WRITABLE – hide drive letter for writable volumes
0x0000008	DRIVELETTER_HIDE_READONLY – hide drive letter for AppStack volumes

The default registry value is 6. This mean that for writable volumes drive letter will be hidden and for AppStack volumes drive letter will not be assigned.

SVservice Configuration Parameters

Registry keys and optional values are set in the following registry key path:

HKLM\SYSTEM\CurrentControlSet\services\svservice\Parameters

Value	Type	Description
LogFileSizeInKB	REG_DWORD	The size of the log file before rotating the log file. If undefined, the default is 51200 (50MB).
MaxDelayTimeOutS	REG_DWORD	Defined in seconds the maximum wait for a response from the App Volumes Manager. If set to 0, wait forever. If undefined, default is 2 minutes
ResolveTimeOutMs	REG_DWORD	Defined in milliseconds for name resolution. If resolution takes longer than this timeout value, the action is canceled If undefined, default is to wait for completion
ConnectTimeOutMs	REG_DWORD	Defined in milliseconds for server connection requests. If a connection request takes longer than this timeout value, the request is canceled. If undefined, the default is 10 seconds.
SendTimeOutMs	REG_DWORD	Defined in milliseconds for sending requests. If sending a request takes longer than this timeout value, the send is canceled. If undefined, default is 30 seconds
ReceiveTimeOutMs	REG_DWORD	Defined in milliseconds to receive a response to a request. If a response takes longer than this timeout value, the request is canceled. If undefined, the default is 5 minutes.
ProvisioningCompleteTimeOut	REG_DWORD	Defined in seconds to keep trying to contact the App Volumes Manager after provisioning is completed. If undefined, default is 120
DomainNameWaitTimeOut	REG_DWORD	Defined in seconds how long to wait for the computer during startup to resolve Active Directory domain name. On non-domain joined machines, this can be set to 1 allowing for a faster logon time. If undefined, the default is 60.

Value	Type	Description
WaitInstallFonts	REG_DWORD	Defines how long to wait in seconds for fonts to be installed If undefined, the default is to not wait for completion.
WaitUninstallFonts	REG_DWORD	Defines how long to wait in seconds for fonts to be removed If undefined, the default is to not wait for completion.
WaitForFirstVolumeOnly	REG_DWORD	Defined in seconds, only hold logon for the first volume. Once the first volume is complete, the rest will be handled in the background, and the logon process is allowed to proceed. To wait for all volumes to load before releasing the logon process set this value to 0. If undefined, default is 1
Volume Behavior Parameters		
VolWaitTimeout	REG_DWORD	Defined in seconds, how long to wait for a volume to be processed before ignoring the volume and proceeding with the logon process. If undefined, default is 180
VolDelayLoadTime	REG_DWORD	Defined in seconds, how long after logon process to delay volume attachments. This value is ignored if a writable volume is used. Writable volumes must be attached prior to any AppStacks. If the value is greater than VolWaitTimeout, it will be reduced to the value of VolWaitTimeout. This may speed up login time by delaying the virtualizing of applications until after logon is complete. If undefined, default is 0 (do not delay load time)
CleanSystemWritable	REG_DWORD	If set to 1 and no writable volume is attached, SVservice will clear any changes saved to the system during operation after a reboot. If set to 0, changes are stored in c:\SVROOT on system volume

Value	Type	Description
Services, Drivers, and General Behavior Parameters		
RebootAfterDetach	REG_DWORD	If set to 1, automatically reboot the system after a user logs off. If undefined, default is 0
DisableAutoStartServices	REG_DWORD	If set to 1, Do not automatically start services on volumes after attach If undefined, default is 0
HidePopups	REG_DWORD	If set to 1, svservice.exe will not generate popups. If undefined, default is 0
DisableRunKeys	REG_DWORD	If set to 1, applications in the Run key will not be called. This will be in both AppStack and writable volumes. If undefined, default is 0

vCenter Custom Role

You can use a custom vCenter account. To do this, manually create a new vCenter role and assign following privileges:

Object	Permission
Datastore	Allocate space
	Browse datastore
	Low level file operations
	Remove file
	Update virtual machine files
Folder	Create folder
	Delete folder
Global	Cancel task
Host	Local operations
	Create virtual machine
	Delete virtual machine
	Reconfigure virtual machine
Resource	Assign virtual machine to resource pool
Sessions	View and stop sessions
Tasks	Create task
Virtual machine	Configuration
	Add existing disk

Object	Permission
	Add new disk
	Add or remove device
	Change resource
	Remove disk
	Settings
	Interaction
	Power Off
	Power On
	Suspend
	Inventory
	Create from existing
	Create new
	Move
	Register
	Remove
	Unregister
	Provisioning
	Clone Template
	Clone virtual machine
	Create template from virtual machine
	Customize
	Deploy Template
	Mark as template
	Mark as virtual machine
	Modify customization specification
	Promote disks
	Read customization specifications

Use Of PowerCLI To Create A Custom V Center Role

You can also create a customs role by using PowerCLI

To accomplish this task, create a text file named **CV_role_ids.txt** with following contents:

```
System.Anonymous

System.View

System.Read
```

```
Global.CancelTask
Folder.Create
Folder.Delete
Datastore.Browse
Datastore.DeleteFile
Datastore.FileManagement
Datastore.AllocateSpace
Datastore.UpdateVirtualMachineFiles
Host.Local.CreateVM
Host.Local.ReconfigVM
Host.Local.DeleteVM
VirtualMachine.Inventory.Create
VirtualMachine.Inventory.CreateFromExisting
VirtualMachine.Inventory.Register
VirtualMachine.Inventory.Delete
VirtualMachine.Inventory.Unregister
VirtualMachine.Inventory.Move
VirtualMachine.Interact.PowerOn
VirtualMachine.Interact.PowerOff
VirtualMachine.Interact.Suspend
VirtualMachine.Config.AddExistingDisk
VirtualMachine.Config.AddNewDisk
VirtualMachine.Config.RemoveDisk
VirtualMachine.Config.AddRemoveDevice
VirtualMachine.Config.Settings
VirtualMachine.Config.Resource
VirtualMachine.Provisioning.Customize
VirtualMachine.Provisioning.Clone
VirtualMachine.Provisioning.PromoteDisks
```

```
VirtualMachine.Provisioning.CreateTemplateFromVM
VirtualMachine.Provisioning.DeployTemplate
VirtualMachine.Provisioning.CloneTemplate
VirtualMachine.Provisioning.MarkAsTemplate
VirtualMachine.Provisioning.MarkAsVM
VirtualMachine.Provisioning.ReadCustSpecs
VirtualMachine.Provisioning.ModifyCustSpecs
Resource.AssignVMToPool
Task.Create
Sessions.TerminateSession
```

Next, execute the following PowerShell script after modifying the vCenter Server location:

```
$cvRole = "App Volumes Role"
$cvRolePermFile = "cv_role_ids.txt"
$viserver = "vcenter.server.fqdn"
Connect-VIServer -server $viserver
$cvRoleIds = @()
Get-Content $cvRolePermFile | Foreach-Object{
    $cvRoleIds += $_
}
New-VIRole -name $cvRole -Privilege (Get-VIPrivilege -Server $viserver -
id $cvRoleIds) -Server $viserver
Set-VIRole -Role $cvRole -AddPrivilege (Get-VIPrivilege -Server $viserver
-id $cvRoleIds) -Server $viserver
```

Scale The VMware App Volumes Manager

You can easily scale VMware App Volumes by installing an additional App Volumes Manager component on multiple servers and pointing them to a shared SQL database.

Multiple App Volumes Managers can be load balanced by a hardware load balancer. Alternatively, App Volumes Agent can be configured to communicate with multiple App Volumes Manager servers.

To install additional App Volumes Manager instances, follow standard installation procedures and point a new instance to the existing SQL database.

Important: Ensure that the **Create a new database or overwrite the existing database** checkbox is not set.

During VMware App Volumes Agent configuration, you can specify the load balanced FQDN of the App Volumes Manager.

Alternatively, you can configure App Volumes Agent to communicate with multiple managers by modifying the following registry key:

`HKLM\SYSTEM\CurrentControlSet\Services\svservice\Parameters`

Adding string values named `ManagerN` (where N is number from 0 to 9) and value data of App Volumes Manager FQDN.

Best Practices And Recommendations 9

This section provides some best practices and recommendations that you can use while working with App Volumes.

Install Google Chrome To A Writable Volume

You can install Google Chrome or Chrome Plug-ins to a writable volume. To install Chrome plugins to a writable volume, the writable volume must be assigned a drive letter. Define the Windows registry value WritableVolumeDL and set it to 1. If you want to hide this drive letter from end users, you can enable the GPO.

Provisioning Best Practices

- Only one provisioning process should be performed in each virtual machine, but multiple virtual machines can be provisioned at once.
- If the provisioning virtual machine has a service pack, such as Service Pack 1, all virtual machines delivering applications must be at the same service pack level (or newer).
- While not required, for best performance application dependencies (such as Java, or .NET) should be included in the same AppStack as the application.
- The provisioning system should not have the following installed or enabled:
    - Anti-Virus agents
    - Horizon View Agent
    - Any other filter driver applications
- When provisioning an application, always install the application for all users. This ensures the application installs under Program Files rather than user profile. This will also create application icons in the All Users folder.
- Ideally the provisioning virtual machine would be joined to the same domain as the production virtual machine but not required. This is dependent on applications being provisioned. Some application requirements and licensing models require that the virtual machine should also share a common SID with the production virtual machine.
- Applications requiring a common SID should not be delivered to a pool or to virtual machines that have had Sysprep run on them. These cases should be used in conjunction with Horizon View Composer or other similar OS cloning technologies that preserve the machine SID.
- Virtual machines used for provisioning should have a snapshot dedicated to the state of a user's desktop. After provisioning virtual machines should have a clean snapshot that was made directly following the VMware App Volumes agent installation. After the completion of provisioning, the virtual machine reverts to the clean state (snapshot).
- **Important**: The provisioning of AppStacks must be performed on a clean base image, a virtual machine that resembles as closely as possible the target environment to which

you later plan to deploy the AppStack. For example, the provisioning virtual machine and target should be at the same patch and Service Pack level and, if applications are included in the base image, they should also be in the provisioning virtual machine.

- Provisioning should be done on a virtual machine that did not have any AppStacks previously assigned to it. If there were any AppStacks assigned to the virtual machine or the virtual machine has been used for Provisioning before, the virtual machine should be set back to the clean snapshot before provisioning a new AppStack.

Recommendations

When you use Internet Explorer on Windows Server to manage VMware App Volumes, turn off the IE Enhanced Security, or add the manager hostname to list of trusted sites in IE.

Limitations

- Support for physical endpoints and AppStacks is only given under the following constraints:
  - VHD In-Guest mode is the only supported machine manager mode.
  - Constant network connection is required.
  - OS on the physical device should be non-persistent, streamed, or both.
- Support for physical endpoints and Writable Volumes is only given under the following constraints:
  - VHD In-Guest mode is the only supported machine manager mode.
  - Constant network connection is required.
  - Automatic Windows Update should be disabled.
  - Any updates to the OS should not be performed with the Writable Volume detached.
- Writable Volumes should be detached when performing a user log out. Profiles in the Writable Volume could be corrupted and on next login cause the profile to be recreated.
- All Volumes should be detached when performing any revert, recompose, or refresh of the virtual machines.
- Provisioning of Internet Explorer into an AppStack is not supported. Due to the tight OS integration and dependencies, it is recommended to use an application isolation technology such as VMware ThinApp. VMware App Volumes can then be utilized for delivery of the isolated application package.
- Applications must be provisioned and delivered to the same OS type (32 or 64 bit).
- Outlook search may generate a configuration error when search indexing is enabled. Disable the Windows Search service and search will work without search indexing.
- The GPO **Control Read or Write Access to Removable Devices or Media** should be disabled.
- If you configured your environment with the vSphere Hardening Guide recommendations and disabled the **Datastore Web browsing**, App Volumes may stop working. To fix this issue, enable Datastore Web Browsing by following the procedure below:

- Edit the `vpxd.cfg` file and ensure that the following element is set:
  `<enableHttpDatastoreAccess>true</enableHttpDatastoreAccess>`
- This should be the only occurrence of this element, and it should be within the <vpxd>...</vpxd> element in vpxd.cfg. Also, verify if there is a restart of the vCenter service to make the config file change apply. This may restart other related VMware services.