

# VMWARE APP VOLUMES TECHNICAL FAQ

VMware App Volumes 2.10 and 2.11

VMware App Volumes™ is an essential element of JMP, the next-generation VMware desktop and application delivery platform. JMP (pronounced *jump*), which stands for Just-in-Time Management Platform, represents capabilities in VMware Horizon 7 Enterprise Edition that deliver Just-in-Time Desktops and Apps in a flexible, fast, and personalized manner. JMP is composed of the following VMware technologies:

- VMware Instant Clone Technology for fast desktop and RDSH provisioning
- VMware App Volumes for real-time application delivery
- VMware User Environment Manager™ for contextual policy management

JMP allows components of a desktop or RDSH server to be decoupled and managed independently in a centralized manner, yet reconstituted on demand to deliver a personalized user workspace when needed. JMP is supported with both on-premises and cloud-based Horizon 7 deployments, providing a unified and consistent management platform regardless of your deployment topology. The JMP approach provides several key benefits, including simplified desktop and RDSH image management, faster delivery and maintenance of applications, and elimination of the need to manage “full persistent” desktops.

## Organization of These Frequently Asked Questions for App Volumes

The VMware App Volumes Technical FAQ addresses technical questions from administrators and users of App Volumes.

Questions and answers are divided into the following topics:

- [App Volumes Requirements and Maximums](#)
- [App Volumes Installation and Configuration](#)
- [App Volumes Storage](#)
- [App Volumes Management](#)
- [App Volumes with Remote Desktop Session Hosts](#)
- [Troubleshooting App Volumes](#)

## App Volumes Requirements and Maximums

This section addresses questions related to App Volumes requirements and maximums.

### Q. What are the provisioning machine requirements for installing applications for AppStack provisioning?

- A. You must install applications for AppStack provisioning on a clean provisioning virtual machine (VM). The clean VM must be similar to the VMs in your target environment. For example, the provisioning machine and target machine (desktop image) must be at the same OS level, and it is recommended they be at the same patch and Service Pack level. If applications are already installed on the target machine, install them on the provisioning machine before beginning capture. You must also install and configure the App Volumes Agent on the clean provisioning machine prior to capturing applications.

Disable all automatic updates, such as Windows Update. Prior to installing the applications, temporarily disable antivirus definition updates. If you are using other application virtualization technologies in production, such as [VMware ThinApp](#),<sup>®</sup> Microsoft App-V, and so on, along with App Volumes, the capture and build elements must not be open and in process on the provisioning OS. Eliminating application virtualization open processes is recommended to prevent potential conflicts between App Volumes drivers and application virtualization drivers, which could cause inconsistent results in the provisioning process.

### Q. What is the minimum level of access to Active Directory that is required for App Volumes?

- A. App Volumes requires a service account with read-only access to the Active Directory domain. Therefore, the general App Volumes management account must be able to read and browse the entire AD domain to view memberships and items. The minimum AD domain is Microsoft Windows Server 2003 functional level.

### Q. Is there a maximum number of applications in an App Volumes container (either AppStack or writable volume)? Is there a recommended number of applications in a container?

- A. There is no maximum or recommended number of applications in an App Volumes container. An AppStack or writable volume can contain a single application or multiple applications. App Volumes does not limit the number of applications in an AppStack; however the Windows operating system might be impacted by running a large number of applications simultaneously. For this reason, administrators should perform an application-specific evaluation before deploying in production. To determine the number of applications that might run simultaneously, combine departmental applications into separate AppStacks, such as, IT, Finance, and HR. Administrators can assess the environment based on the total number of users and AppStacks required for those users.

## App Volumes Installation and Configuration

This section contains questions related to App Volumes installation and configuration.

### Q. Can I assign multiple writable volumes to one user?

- A. In App Volumes 2.7, users are limited to one assigned writable volume at any one point in time.

In App Volumes 2.9 and later, users can have more than one writable volume assigned, but can use only one writable volume at a time.

**Q. How do I reset App Volumes back to a fresh install?**

- A. To reset the App Volumes installation back to a fresh configuration, use the **sv\_reset.bat** script file in the App Volumes Manager install directory.

**Caution:** The **sv\_reset.bat** file resets most of your previous configuration, and returns the environment to a newly installed state. You can reimport AppStack information, because it is not reset. If you are using an external database, you can point the App Volumes Manager back to that SQL instance and restore previous configuration details. However, if you are not using an external database, all other configuration details need to be re-specified, including licenses, the database, hypervisor and security configurations, and storage.

**Q. What needs to be installed on the AppStack?**

- A. An AppStack does not require an agent or other software. Install only the required applications for your environment on the AppStack.

During AppStack creation, the new AppStack is attached to a clean provisioning machine, which has the App Volumes Agent installed. At this point, the AppStack is a read-write VMDK for application installation. You are prompted to install your required applications on the AppStack. After this, you complete the AppStack creation process. The AppStack is then detached from the provisioning machine, made into a read-only VMDK, and is ready for assignment to users and systems.

**Q. What kind of applications does App Volumes support?**

- A. App Volumes supports most Windows applications, including services and drivers. If you need an application to continue to run after the user logs out, it is best to natively install this application on the desktop or desktop image. Do not install antivirus software or OS patches on AppStacks.

Because each environment has different requirements, administrators should perform an environment-specific evaluation before deploying in production.

**Q. What happens if an application installation needs a reboot?**

- A. You can reboot the clean provisioning VM as many times as needed to complete the installation. After the application has been installed, the provisioning VM returns to provisioning mode.

**Q. How does App Volumes handle conflicts? For example, a user has two AppStacks attached with the same application installed in each AppStack. Which application is available to the user?**

- A. If there is a conflict, the last AppStack attached is presented first. For example, **<AppStack1>** and **<AppStack2>** both contain the same version of Microsoft Word 2013. If **<AppStack2>** is attached last, its Microsoft Word application is presented to the user.

It is important to note that if there are any differences between the applications, the user may not be presented with a working application. If **<AppStack2>** contains a patched version of Microsoft Word 2013, then it should be tested to confirm it launches.

**Recommendations**

- Ensure that there are no application conflicts. If two versions of the same application are required, you can use VMware ThinApp packaging to isolate the two versions, which resolves these application conflicts.
- Ensure that all applications are updated to the same version and patch level.

**Q. How does App Volumes capture user-installed applications?**

- A. User-installed applications (UIAs) are captured on user-assigned writable volumes. A writable volume persists across user sessions, allowing the user data to move across systems with the user. After a user is assigned a writable volume, the App Volumes Agent running on the user's system redirects all UIAs and settings to the user's writable volume.

Depending upon the template used to create the writable volume, only particular user changes are saved. Two templates are now available for writable volumes:

- **UIA only** – Saves any UIAs in a read-write container.
- **UIA and user profile** – Captures all changes made by the user, including local profile information.

To save only the profile, but not UIAs, choose the **UIA and user profile** template and do not give the user administrative rights to install applications. (Microsoft requires administrative rights to install applications.)

**Q. Can I capture the View Agent in an AppStack and assign it to my View desktop master images that do not have the View Agent installed?**

- A. No, you must install the View Agent on the View desktop master image.

**Q. Which versions of Microsoft Office are supported?**

- A. App Volumes supports Microsoft Office using KMS licensing (Microsoft Office 2010, Microsoft Office 2013) and Microsoft Office 365 version 2013.

**Q. Can a Microsoft Office plug-in or add-on be installed in a separate AppStack, or do I have to install it on the same AppStack as the Microsoft Office installation?**

- A. The most straightforward method is to provision Microsoft Office plug-ins or add-ons in the same AppStack as the Microsoft Office installation.

However, if necessary, you can provision plug-ins or add-ons in separate AppStacks from the Microsoft applications to which they apply. Before provisioning the plug-in or add-on, the primary application must be installed natively in the provisioning OS.

AppStack precedence is important. Attach the Office AppStack first, then attach the AppStack containing plug-ins or add-ons. You can define AppStack precedence from the App Volumes Manager console.

See [How does App Volumes decide which AppStack is presented first?](#)

**Important:** Ensure the plug-in or add-on is at the same version as the Office AppStack. This includes any patches or updates.

**Q. What are the Microsoft Office installation best practices?**

- A. It is recommended that you install Office core applications in the base virtual desktop image and create one AppStack for non-core Office applications, such as Visio, Project, or Visio and Project together. To provision the AppStack with Visio and Project, use a provisioning machine with the same Office core applications as on the base image. After the AppStack is created, you can then assign the AppStack only to users who require these non-core Office applications.

**Q. If I upgrade from App Volumes 2.5 to App Volumes 2.6 or later, do I need to rebuild my AppStacks?**

**A.** You need to rebuild AppStacks after an upgrade from App Volumes 2.5 to a newer version. AppStacks in App Volumes 2.6 and later are forward-compatible and carry the functionality of the previous version. However, additional features or fixes in later versions are not applied to the AppStack of the previous version.

**Q. Can the clean provisioning virtual machine be a View VM?**

**A.** It is not recommended to use a View VM as a clean provisioning VM. You would have to uninstall the View Agent. Dependencies previously installed by the View Agent, such as Microsoft side-by-side (SxS) shared libraries, are not reinstalled, and, therefore, not captured by the App Volumes provisioning process.

**Q. Is there a specific order in which to install the View Agent and the App Volumes Agent?**

**A.** Install the View Agent on your View master image first, then the VMware User Environment Manager Agent, and then the App Volumes Agent.

**Q. Can I use App Volumes for non-End-User-Computing products from VMware?**

**A.** Yes. App Volumes works with VMware vSphere® and other hypervisors when using App Volumes In-Guest Mounting mode. On the desktop and application presentation side, App Volumes also works in conjunction with Citrix XenApp and Citrix XenDesktop if they are running on vSphere or Microsoft Hyper-V.

**Q. Does App Volumes support vSphere 6?**

**A.** App Volumes 2.9 and later support vSphere 6. App Volumes 2.7 does not support vSphere 6, but the two can work together without issues.

**Q. Can a single instance of App Volumes support multiple VMware vCenter™ Servers?**

**A.** This was an experimental feature within App Volumes 2.7. App Volumes 2.9 and later officially support multiple vCenter Servers within a single instance of App Volumes.

**Q. Does AppVolumes support physical machines?**

**A.** Yes. App Volumes 2.9 and later versions support delivering AppStacks and writable volumes to physical machines under the following conditions:

- A constant network connection must be available.
- Automatic Windows updates must be disabled.
- The operating system on the physical endpoint must be nonpersistent, streamed, or both.
- Updates to the operating system cannot be performed with AppStacks or writable volumes attached.

## App Volumes Storage

This section contains questions related to App Volumes storage.

### Q. Can I place a collection of VMDKs on storage local to the VMware ESXi™ host for faster mounting of AppStacks?

- A. Yes. You can enable the Mount Local storage option in App Volumes to check local storage first and then check central storage. AppStacks are mounted faster if stored locally to the ESXi host. Place VMDKs on local storage and, as a safeguard, place duplicates of these VMDKs on central storage in case the ESXi host fails. Then the VMs reboot on other hosts that have access to the centrally stored VMDKs.

You can use the following two options to configure storage. These options operate independently. You can enable none, one, or both.

- **Mount Local** – Forces App Volumes to look at the datastore where the VM resides for local copies of volumes (both AppStacks and writable volumes). If AppStacks and writable volumes exist on local storage, they are mounted. Local storage shortens the time to mount. Otherwise, App Volumes checks shared storage for these volumes. Using this option in conjunction with local storage allows local mounts of AppStacks, which is faster than sending mount commands through VMware vCenter to the respective hosts.
- **Mount on Host** – Allows App Volumes to issue a mount command directly to the ESXi hosts instead of issuing the command through vCenter. App Volumes attaches AppStacks and writable volumes directly to the ESXi hosts. This option shortens the command path and time to mount. You can use local storage for this option.

**Note:** For these features to work, ESXi hosts must use the same root-level user credentials.

### Q. How do storage groups work?

- A. You can group a number of datastores into a storage group. There are two types of storage groups: one for AppStacks and another for writable volumes. AppStack storage groups replicate single AppStacks across multiple datastores. Writable volume storage groups distribute writable volumes across datastores.

AppStack storage groups use the following automation options:

- **Automatic replication** – Replicate across all datastores any AppStack that is placed on any datastore
- **Automatic import** – After replication, import AppStacks into the App Volumes Manager, ready for assignment from all datastores

Writable volume storage groups use the following distribution strategies:

- **Spread** – Distribute writable volumes evenly across datastores
- **Round-robin** – Sequentially distribute writable volumes to the datastore with the oldest used time

Distribution strategies are not used for AppStacks.

**Q. Does App Volumes work on VMware vSAN™?**

A. Yes, App Volumes 2.11 works on vSAN. Adhere to the sizing guidelines in [Configuration Maximums for vSphere 6.0](#).

For example:

- 64 hosts per cluster
- 200 VMs per ESXi 6.0 host, 100 VMs per ESXi 5.5 host
- 6,400 VMs per cluster
- 5 disk groups
- 7 disks per disk group
- 1 flash device per disk group
- 9,000 components per host

**App Volumes Management**

This section contains questions related to the management of App Volumes.

**Q. If I assign an AppStack to a user for desktop pool A, how does the user get that AppStack when logged into desktop pool B?**

A. You can assign one or more AppStacks to users, computers, user groups, or organizational units in any combination. This means that one user can have multiple AppStacks assigned to them and can access those AppStacks from any desktop pool.

**Q. Does assigning an AppStack require a system reboot or user logout?**

A. No. You can attach AppStacks to user desktops either immediately or at the next login or reboot. It is recommended to always assign or unassign AppStacks on login, logout, or system reboot because it is the most friendly way for Windows to handle the integration of information contained within AppStacks and writable volumes.

**Q. How does App Volumes manage machine-based AppStack assignments versus user-based assignments?**

A. The App Volumes Agent checks for machine-based assignments first. If a machine-based assignment is found, all user-based assignments are ignored. This includes User, Group, and OU AppStack assignments, as well as writable volumes.

If a user-based assignment is found, AppStacks are attached in this order: OU, Groups, and Users. Writable volumes are always attached first.

**Q. How does App Volumes assign applications if users are not logged in, but applications are assigned immediately?**

A. If the assignment is machine-based, App Volumes attaches the AppStack immediately. If the assignment is user-based, App Volumes waits until the user logs in and then attaches the AppStack.



**Q. How does App Volumes decide which AppStack is presented first?**

**A.** AppStacks are attached in the order that they are assigned. For example, <AppStack1> and <AppStack2> are assigned respectively to the user. <AppStack1> was assigned first and therefore is attached first.

You can override this setting in the App Volumes Manager interface. Depending on how you assigned the AppStacks, click the **Users**, **Computers**, or **Groups** tab and select the **Override Precedence** option. Arrange the AppStacks in the order that you require.

**Q. What happens if I update an AppStack with an application already installed in a user's writable volume? For example, Firefox 12 is installed in the user's writable volume, and then I update the base AppStack to include Firefox 23.**

**A.** AppStacks are attached in the order that they are assigned. If two AppStacks have the same application installed, the AppStack attached last takes priority. If the user has AppStacks and a writable volume, the writable volume always takes precedence. If the user has a writable volume, the user accesses the Firefox version in the writable volume.

If users have permissions to install applications, changes are denoted locally, either in the user's writable volume if it exists or in a hidden folder on the system drive. If a user installs an application and then an AppStack with the same application is attached, the conflict is denoted and handled accordingly.

**Q. Can updates be performed to an AppStack without disrupting users who have the AppStack in use?**

**A.** Yes. You update applications on the original AppStack from the App Volumes Manager console. This process clones the original AppStack, so the existing applications are available to users. The new AppStack with the updated applications is provisioned at next login. Also, the old AppStack is deprovisioned the next time the user logs in.

**Q. The AppStack VMDK is presented to the desktop without a drive letter. Does the application path still use the C: drive? If so, how?**

**A.** The application path still uses the C: drive. The attachment is a symbolic link within Windows, so the system sees it as part of the existing C: drive. If a user installs an application to the C: drive, it is redirected to the writable volume.

**Q. We can deliver 200+ applications with a single VMDK, but are there limits to how many VMDKs can be assigned to a user or virtual machine?**

**A.** Because each AppStack is a VMDK, the limitation is at the level of the ESXi host and guest VM.

[Configuration Maximums for vSphere 5.5](#) and [Configuration Maximums for vSphere 6.0](#) list specific information. For example:

- Virtual disks per VM (PVSCSI): 60
- Virtual disks per host: 2,048

The recommendation is to stay below 20 AppStacks per guest VM.

**Note:** External storage has its own limits per connection.

**Q.** I have a slow drive infrastructure, and it takes time to initialize the 20 GB AppStack template for a new AppStack. Can I optimize this?

**A.** Yes. The default AppStack size is 20 GB. However, you can reduce the size by creating a new AppStack template.

For details, see the VMware knowledge base article [Creating a new App Volumes AppStack template VMDK smaller than 20 GB \(2116022\)](#).

**Note:** If you use a smaller AppStack, some applications might not install correctly, or App Volumes might fail to capture an application installation in an AppStack. Administrators should perform an environment-specific evaluation before deploying in production.

The AppStack size must meet at least the minimum application requirements, plus space needed for temporary installation files during the application install process. For example, Adobe Reader 11 has a 384 MB minimum available disk size, but requires more than 512 MB free to install. Otherwise, the installation fails.

**Q.** Does the App Volumes Manager server support SSL?

**A.** Yes. However, SSL is not enabled by default, even if you specify an HTTPS port during Agent installation. The App Volumes Agent must communicate with the App Volumes Manager server. To enable SSL communication between these components, you must update the registry after installing the App Volumes Agents. For details, see the VMware knowledge base article [Enabling SSL communication on an App Volumes Agent \(2091589\)](#).

**Q.** After I migrate my App Volumes Manager server or recreate an App Volumes Manager server, can I import (or share) my AppStacks across servers?

**A.** If the new App Volumes Manager server can access the same storage as the old Manager server, you can import App Volumes AppStacks directly and use them in your new environment.

If the new Manager server cannot access the storage where the AppStacks are located, you can copy AppStacks manually. For details, see the VMware knowledge base article [Manually copying an AppStack to a new or migrated App Volumes Manager server \(2115440\)](#).

**Q. How can I plan for disaster recovery?**

- A. AppStacks and writable volumes are VMDK files, not VM objects. For backups, ensure that your third-party solution is targeting the storage where the VMDK files and supporting files exist.

Make sure to back up the following:

- SQL database and logs
- AppStacks
- Writable volumes

For recovery:

1. Restore the SQL database.
2. Install App Volumes Manager.
3. Connect to the existing SQL database.
4. Update the App Volumes Agent and restart the service.
5. Import AppStacks and writable volumes as required.

It is recommended to use dedicated datastores for AppStacks and writable volumes so that backup software can target entire volumes.

You can download the [App Volumes Backup Utility Fling](#), which allows AppStacks and writable volumes to be backed up and recovered.

**Q. Does App Volumes integrate with other profile-management solutions?**

- A. Yes. App Volumes works in conjunction with [VMware User Environment Manager](#) or with other profile or user environment management (UEM) solutions. An App Volumes writable volume delivers the applications, allowing UEM solutions to make contextual changes to applications after delivery, such as Active Directory GPO settings and other application-process-hooking solutions.

User Environment Manager can granularly manage App Volumes applications, including the complete Windows environment and application settings, personalization of these settings, and dynamic policies.

**Q. How well does App Volumes scale?**

- A. The blog post [VMware App Volumes – What About Performance?](#) discusses performance and scalability test results.

**Q. How does the App Volumes acquisition reposition ThinApp?**

- A. App Volumes dynamically delivers applications to desktops in real time. ThinApp provides application isolation and support for legacy applications. Using App Volumes to deliver ThinApp packages allows for real-time delivery of isolated and troublesome applications alongside natively delivered applications.

**Q. How does App Volumes affect the positioning of VMware Mirage™?**

- A. App Volumes rapidly delivers applications to local Windows systems. [Mirage](#) delivers applications to physical Windows systems that are not always online.

**Q. What are the prime use cases for App Volumes?**

**A.** The top use cases for App Volumes are

- Provide a persistent desktop experience in a nonpersistent environment
- Deliver multiple applications from a single AppStack
- Enable user-installed applications in virtual and physical desktops
- Use AppStacks for Remote Desktop Session Host (RDSH) and Citrix XenApp application management
- Leverage ThinApp to provide application isolation within AppStacks
- Deliver just-in-time applications to View virtual desktops in Horizon 7 or to Citrix XenDesktop virtual desktops

**Q. How do I enable multi-vCenter support?**

**A.** App Volumes 2.9 introduced the concept of *Machine Managers*. You add each vCenter Server as a Machine Manager from the App Volumes Manager console.

1. From the App Volumes Manager console, select the **Configuration** tab, and then select the **Machine Managers** tab.
2. Click **Add Machine Manager**.
3. Enter the vCenter Server information, and click **Save**.
4. Follow these steps for each vCenter Server you want to add.

**Q. What do I need to be aware of prior to enabling multi-vCenter support within App Volumes?**

**A.** With Machine Managers, you can use different credentials for each vCenter Server, but ESXi host names and datastore names must be unique across all vCenter environments. After you have enabled multi-vCenter support in your environment, it is not recommended to revert back to a single vCenter configuration.

**Q. What types of performance improvements does App Volumes 2.9 have?**

**A.** AppStack attachments became faster in App Volumes 2.9, resulting in faster login times for end users.

App Volumes 2.10 introduced further performance improvements. For more information, see the [VMware App Volumes Reference Architecture: VMware App Volumes 2.10](#).

**Q. Does App Volumes support instant clones?**

**A.** App Volumes 2.11 supports instant clones. For details, see the blog post [VMware Instant Clone Technology for Just-In-Time Desktop Delivery in Horizon 7 Enterprise Edition](#).

## App Volumes with Remote Desktop Session Hosts

This section contains questions related to App Volumes with RDSH servers.

**Q. How is an AppStack assigned to an RDSH server? Can I assign an AppStack per user login or per server?**

**A.** An AppStack is assignable only to the RDSH server, not to the user.

**Q. If an AppStack is assigned to the RDSH server, is it mounted when the server is powered on?**

**A.** The administrator can choose to mount an AppStack on an RDSH server either immediately or when booting the system.

**Q. Can I assign an AppStack to an RDSH server and select it in the View Administrator console to assign applications to RDSH desktops?**

**A.** Yes. To see AppStacks within the View Administrator console, you must first assign AppStacks to the RDSH server. After the AppStacks have been assigned to the RDSH server, the applications within the AppStacks become available to Horizon 7 for creation of application pools and for assignment of applications to RDSH desktops. More information is available in Module 6 of the [VMware App Volumes Hands-On Lab](#).

**Q. Does the 20-AppStack limit apply with RDSH servers? For example, if I assign an AppStack and 50 users log in, is that 50 AppStack assignments, or do the users share the same VMDK on the RDSH server?**

**A.** The 20 AppStack limit applies, but keep in mind that AppStacks are assigned to RDSH servers directly—to the system, not to the users—so any number of users can log in to the RDSH server and use a single assigned AppStack. The limit of 20 AppStacks applies to how many AppStacks can be assigned to the RDSH server, and this limit is somewhat flexible.

**Q. Can I use App Volumes combined with ThinApp for XenApp hosted applications?**

**A.** Yes. Citrix XenApp servers with natively installed applications face issues arising from Citrix server silos used to solve application conflicts, downtime for application updates, inability to move applications between platforms, and much more. App Volumes AppStacks that are assigned to RDSH servers—working in conjunction with ThinApp—solve these Citrix XenApp application problems.

For more information, see [Implementation Considerations for VMware App Volumes in a Citrix XenApp Environment](#).

## Troubleshooting App Volumes

This section contains questions related to troubleshooting an App Volumes environment.

**Q. After renaming, disabling, or removing a computer or user account in Active Directory, the App Volumes Manager console does not reflect these changes. How do I resolve this?**

**A.** In the App Volumes Manager console:

1. Click the **Directory** tab.
2. Click either the **Computers** or **Users** tab and then select the object that is no longer available.
3. In the upper right, click the **Sync** button.

This action synchronizes the existing Active Directory objects with App Volumes.

**Q. If I want to provision an AppStack, and the provisioning machine shows as not available in the App Volumes Manager console, what do I do?**

**A.** You may have an AppStack assigned to the admin user you are logged in as, or assigned to the provisioning machine itself, from a prior testing phase. Make sure that all AppStacks are unassigned from the provisioning machine and from the admin account you are logged in as. Then log out and log in again from that account or reboot the provisioning machine, as appropriate.

This releases the AppStack assignments that were interfering with provisioning.

**Q. If more troubleshooting is needed, where are the recommended places to look?**

**A.** You can check the following knowledge base articles for further troubleshooting:

- [VMware App Volumes deployment requirements \(2124876\)](#)
- [Network connectivity requirements for App Volumes 2.5.x and later \(2097818\)](#)
- [Confirming VMware App Volumes environment information from registry entries \(2125612\)](#)
- [Troubleshooting VMware App Volumes through the App Volumes Manager console \(2125263\)](#)
- [Location of VMware App Volumes log files \(2091590\)](#)
- [VMware log analysis tools and log analysis examples \(2126475\)](#)
- [Troubleshooting VMware App Volumes using the Ruby on Rails console \(2125212\)](#)
- [Troubleshooting VMware App Volumes using the SQL database \(2125753\)](#)

These KBs are discussed further in the blog posts:

- [How to Troubleshoot an App Volumes Environment, Part 1](#)
- [How to Troubleshoot an App Volumes Environment, Part 2](#)

## About the Authors and Contributors

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### Additional Resources

[VMware App Volumes product webpage](#)

[VMware App Volumes product documentation](#)

[VMware End-User-Computing Blog](#)

[VMware App Volumes Hands-On Lab](#)



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